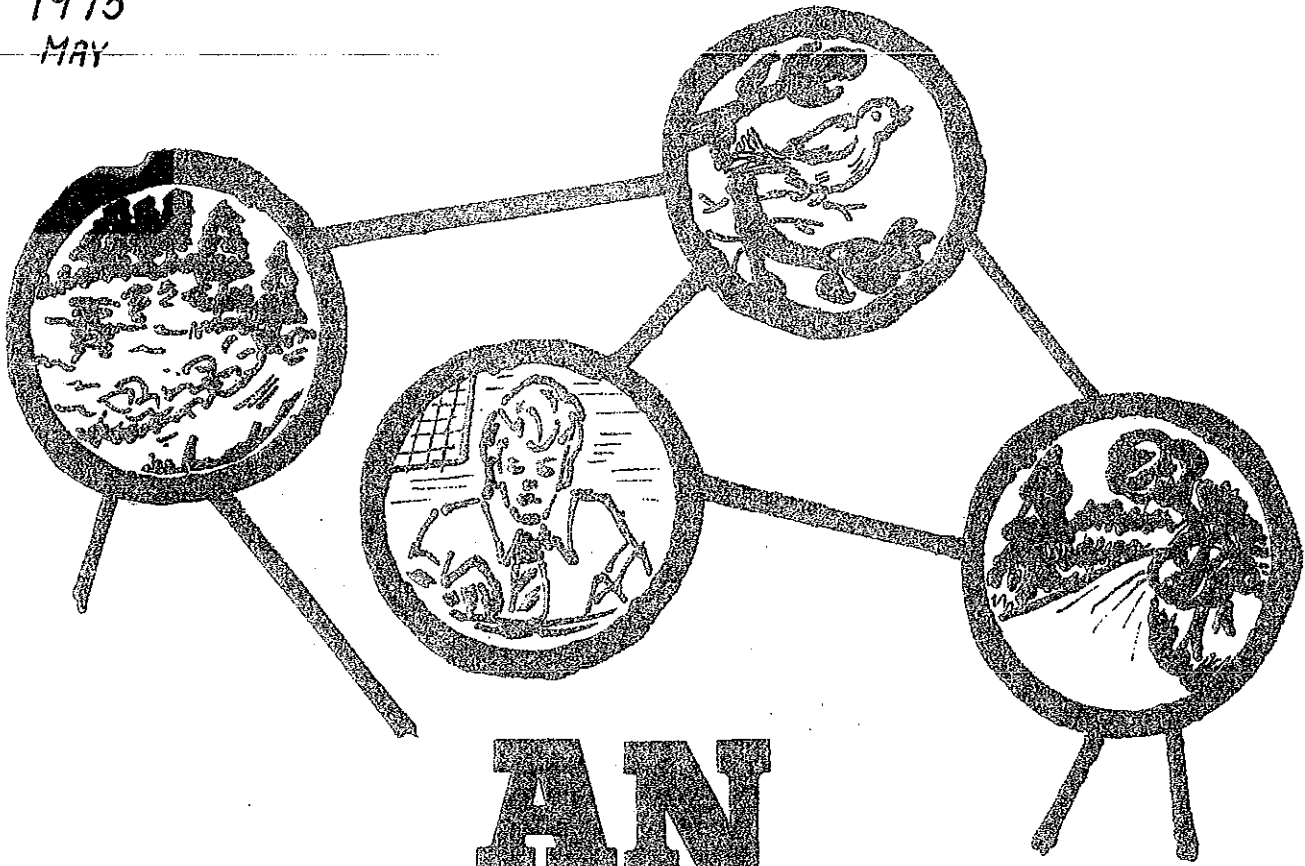
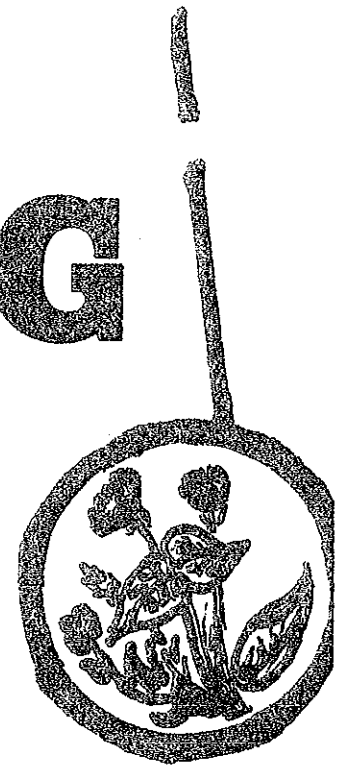


1975  
MAY



**AN  
APPROACH  
TO  
PLANNING  
RIVER  
VALLEY  
TRAILS**



**AN APPROACH TO PLANNING RIVER VALLEY TRAILS**

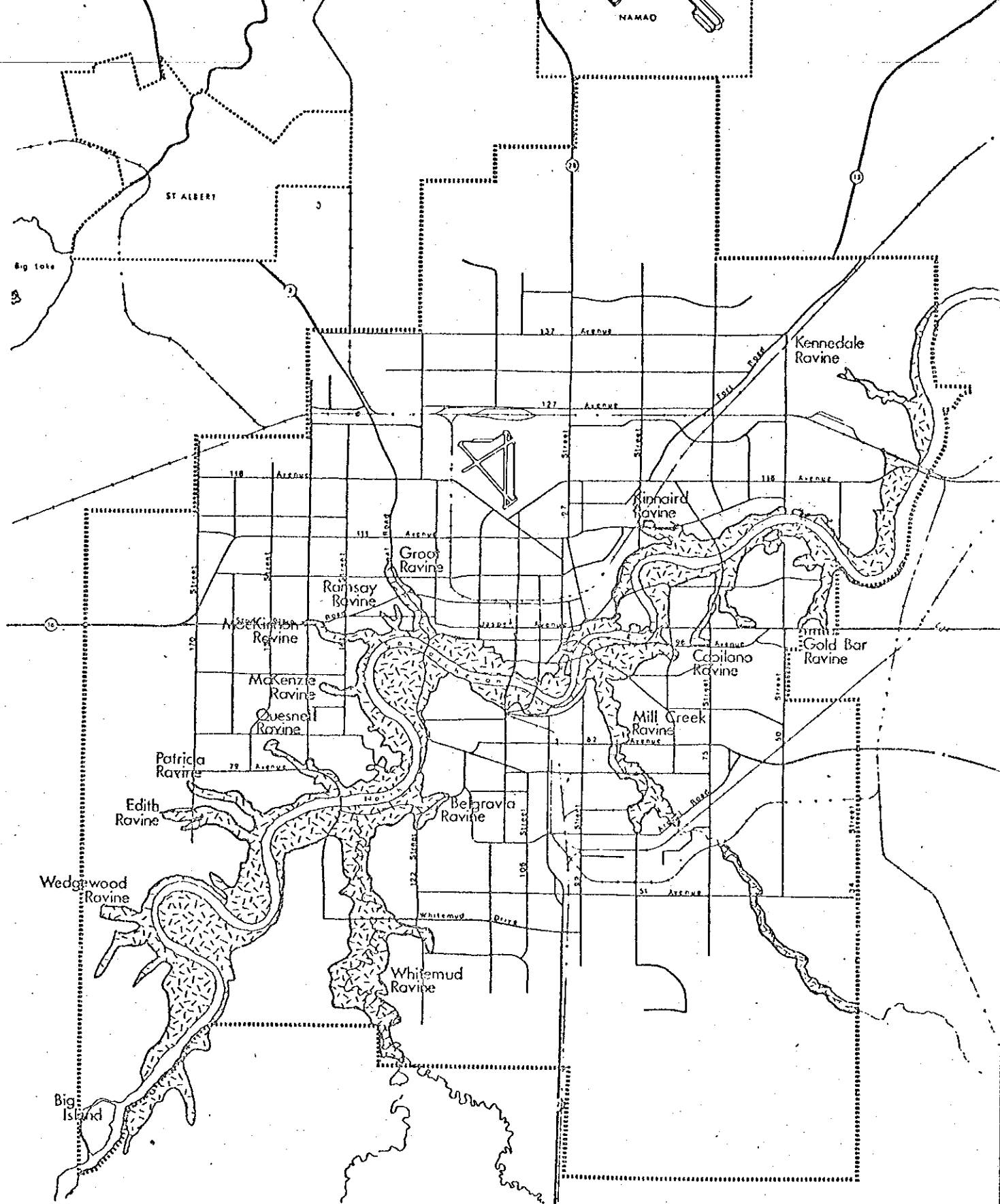
**BY**

**THE EDMONTON SOCIAL PLANNING COUNCIL**

**10006 - 107 Street  
Edmonton - Alberta**

**FUNDED BY: Alberta Environmental Research Trust**

**MAY - 1975**



**EDMONTON RIVER VALLEY  
RAVINE SYSTEM**

Source: City of Edmonton  
Planning Department

## PREFACE

This report is based on the work of the Task Force on River Valley Trails. The Task Force was organized by the Edmonton Social Planning Council which received a grant from the Alberta Environmental Research Trust for this purpose.

The Task Force met several times over 1974 to identify the issues, recommend data sources to the research assistant, develop an approach to trail planning and review draft reports. The members of the Task Force were:

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AN APPROACH TO PLANNING RIVER VALLEY TRAILS

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## INTRODUCTION

The focus of the Task Force has been on the functions of river valley trails and the implications of these functions for trail planning in the (Edmonton) urban setting.

In considering the functions of river valley trails, the Task Force attempted to gather data on present and potential useage of river valley trails according to different type of user (handicapped, skier, cyclist, etc.) and purpose (enjoyment of nature, exercise, etc.). Once it was determined that there was no local data available to the Task Force which had been already collected, a few surveys were undertaken to get some idea of present useage. Potential use was appraised by looking at general recreation trends in this city and others. This information indicated the present and potential functions of trails.

It became apparent that there are different functions seen for trails, not all of which are compatible with one another on the same trail. Thus, an attempt was made to delineate different types of trails, and to indicate how these relate to one another. The different types of trails were considered as part of a total system of trails in which each trails plays its particular role and has a certain geographic relationship to other trails and to other components of the urban fabric. Thus the development of a "systems approach" to trail planning was the culmination of the Task Force's work.

It must be emphasized that the Task Force did not attempt to develop a trail plan for Edmonton as it was beyond the resources of the Task Force to gather all the relevant data and to develop the amount of citizen participation which would be required to create such a plan. What the Task Force did do was attempt to indicate a way of looking at trail planning that would take into account the variety of functions for river valley trails which are seen by the Task Force members as being necessary in this urban environment.

## AN APPROACH TO PLANNING RIVER VALLEY TRAILS

The Task Force has considered the different kinds of trails and the nature of trail planning in the River Valley of Edmonton at the present time. We have concluded that the planning and subsequent value of the trails to Edmontonians could be enhanced through planning the trails as a trail system. Three matters to be considered are: the context of the system (the nature of the terrain under consideration and its location in the Edmonton urban environment), the components of the system (i.e., the nature of the individual trails) and the nature of the system itself (the principles of interconnection of the system components, and the interface with the surrounding environment).

### CONTEXT OF THE SYSTEM

#### 1) NATURE OF THE VALLEY ITSELF

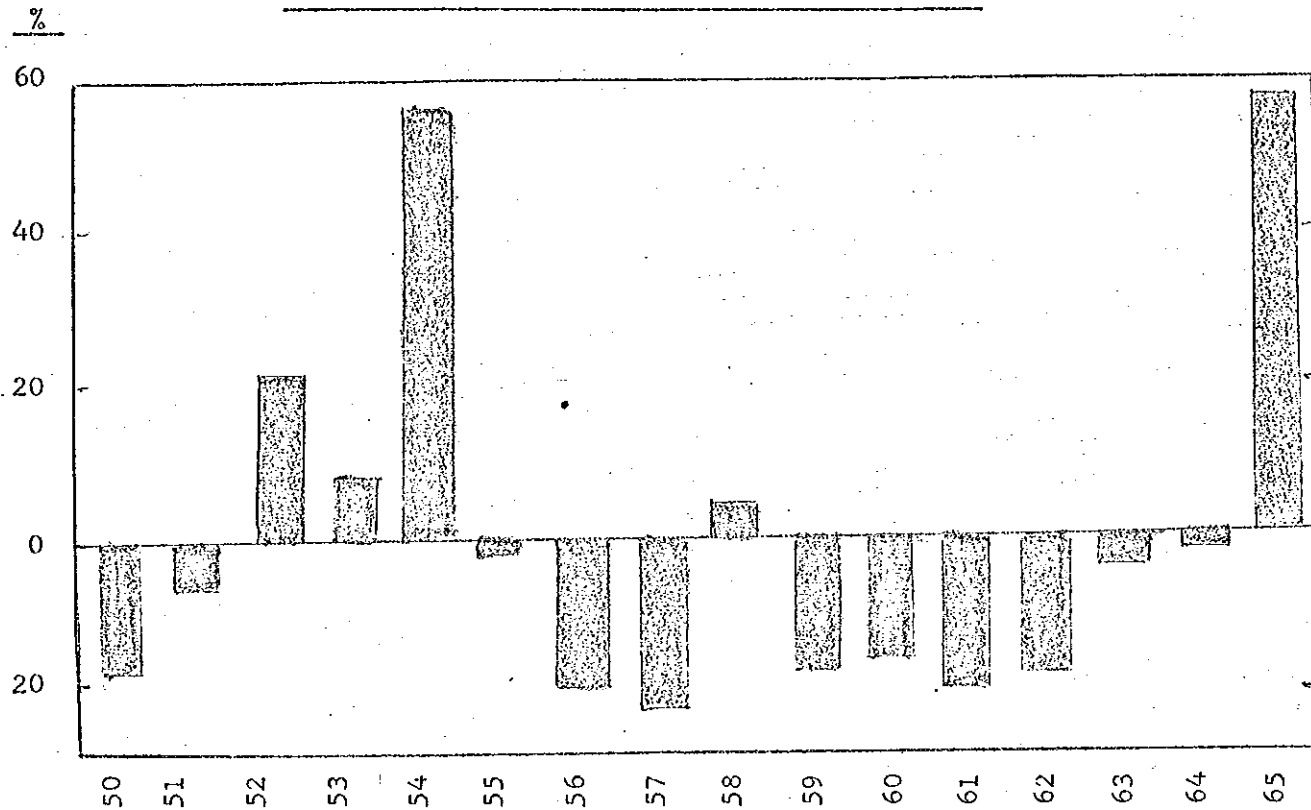
##### a) the River Valley Terrain

The River Valley and its tributaries comprise a natural geographical system. The Valley itself has a depth of some two hundred feet from water level to the top of the bank. In many places the bank is continuous the full two hundred feet creating, on the outer bends of the meanders, escarpments. On the inner bends, there are frequently flats, some of which, such as those housing the golf courses and Mayfair Park, being of substantial width. It is on the inner bends as well that the occasional stretches of direct access to the River may be found. Mostly, however, there is a channel some ten to twenty feet deep with a very steep non-vegetated bank separating the flats, or the major escarpment from the river itself. In times of high water, the water almost overflows this bank; (in times of flood, it does); in periods of low water, the water level is low and the bank high. Figure 1 indicates the cycle of high and low water in the North Saskatchewan River at Edmonton.

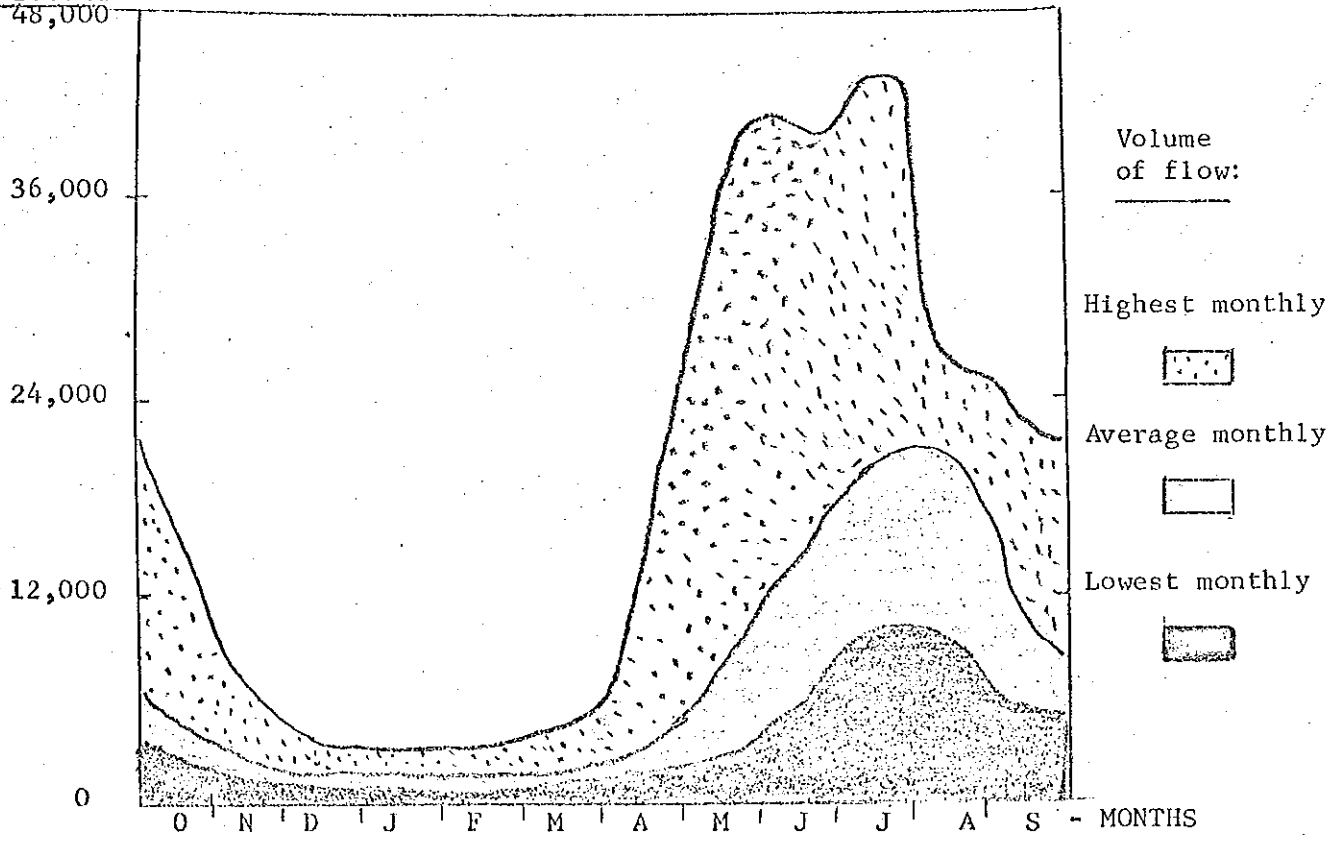
Tributary to the main valley are ravines, some of which contain water courses, though for the most part, these are seasonal. The larger of such courses (Mill Creek, for instance) also have evidence of part meandering, with the attendant flats and steep banks the full length of the valley. McKinnon Ravine is now one big flat as a result of the grading undertaken

**FIGURE 1.**

North Saskatchewan River at Edmonton Average Yearly Flow 5,704,750 Acre Feet



Cubic feet per second  
48,000



SOURCE: Atlas of Alberta, p. 27.



to prepare the ravine for the now rejected major roadway. The total area of these tributary ravines is approximately 3,000 acres, while the entire River Valley System within the City limits comprises over 8,000 acres.(\*).

#### b) Dimensions

The total length of the River course within the City's boundaries is 25 miles; the total length of the tributary system is 30 miles -- 10 of which being the Whitemud/Blackmud Creek system, three of which being the roadway-containing Groat, McKinnon, Quesnell and Capilano ravines.

#### 2) LOCATION OF THE VALLEY WITHIN EDMONTON

The River Valley runs diagonally through the heart of Edmonton. This means that no part of the presently developed City is further than five miles from the River Valley. Thus it is the opinion of the Task Force that the River Valley Trails must be planned in such a way that they take into account that they are running through the centre of an urban centre of half a million people. On the one hand, this means preserving the existing wilderness areas for the relief it provides from developed areas; on the other, recognizing that the valley must be seen as part of an urban environment and be designed to harmonize with the rest of this environment. This latter means accommodating the variety of tastes of and limitations found among a large population and knitting the trail system into the total larger urban system of transportation facilities and various landuses. The first of these criteria for developing the urban system is discussed under the next section entitled "Components of the System"; the second is discussed under the section below entitled "The Trail System As a System".

#### COMPONENTS OF THE SYSTEM

We may identify two major sources of diversity in developing the components of the river valley trail system: diversity in the user (a diversity either chosen or acquired without choice) and diversity in the purpose of the activity.

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(\* ) River Valley Study, City of Edmonton, Planning Department, Research and Long Range Planning Branch, Research Report No. 12, March, 1974.

1) TYPES OF TRAIL USERS

The following types of user may be identified:

a) Handicapped

There is as yet no count of the number of handicapped people in Edmonton. Estimates run as high as one person in seven being sufficiently handicapped (mentally or physically) as to require special attention in urban design. A research paper on the transportation needs of the handicapped in Edmonton determined the following regarding physical handicaps.

"Studies in Canada, the United States and Great Britain reveal that between 7% and 8% of the general population are physically handicapped. As well as those confined to wheelchairs, the physically handicapped include many with multiple sclerosis, cerebral palsy, strokes, heart and respiratory diseases, severe arthritis and rheumatism, amputations, etc. Therefore, when discussing transportation, it is necessary to use a broad definition of the physically handicapped which includes almost all types of physical disabilities.

The above mentioned studies indicate that about one-third of the physically handicapped are elderly, that is, 65 years of age and over (30% of the elderly themselves are handicapped); another third are aged 46 - 64 years, with those 45 years of age and under comprising the final third. The incidence of disability increases significantly with age."(\*)

The Action Group of the Disabled has a file of 1,500 physically handicapped persons in Edmonton; the City Census has received voluntary replies from some 3,000 handicapped (self-defined) persons.

While the exact number of handicapped persons in Edmonton is not known, it is the opinion of the Task Force that there are a significant number of handicapped persons for whom some trails should be specifically designed.

b) Walkers

Apart from the handicapped and the very young, the remainder of Edmontonians are able to use a wide range of trails, in terms of difficulty of use, with no special equipment or training. Results of a survey conducted for this Task Force by students at Grant MacEwan Community College and M. E. LaZerte High School suggest that the vast majority of summer users of

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(\*) Access: Transportation - Transportation Needs of the Handicapped in Edmonton, Prepared by Ted Parnell, Research Consultant, September 16, 1974.

the River Valley parkland are walkers or hikers. Even in the winter, there are a number of walkers or hikers observed in the River Valley (see Appendix E). A study conducted by Parks Canada found that 41% of Albertans in 1972 mentioned walking or hiking as an outdoor recreation activity which they engaged in. (See Appendix E.)

#### c) Cyclers

The student observational survey undertaken for this Task Force confirms the popularity of cycling in the River Valley. Though, as might be expected, far fewer cyclists were observed than walkers; cyclists were the second most frequently observed users. Twenty percent of the Alberta respondents in the Parks Canada study mentioned cycling as one of their outdoor activities.

In the 1973 City of Edmonton Census, there was a count of 116,618 privately owned bicycles in the City (about one bicycle for every four persons). This compares favourably with Calgary which estimates its bicycle ownership at 95 thousand. Ottawa, on the other hand, claims a 1:2 bicycle: population ratio. Ottawa has a fairly well developed system of "bikeways". Since provision of a facility often affects the use of that type of facility (e.g., the provision of more public transit service will increase public transit usage), it seems reasonable to assume that if Edmonton developed a system of cycling trails, bicycle ownership and usage in Edmonton would increase even further.

#### d) Cross-country Skiers

Cross-country skiing would seem to be popular in Edmonton if 73 skiers can be observed by the students in Kinsmen Park in 4 hours, and 66 skiers in Emily Murphy Park in the same period of time (though there could have been some double counting). (See Appendix D.) It is noteworthy though that the Parks Canada study found only 6% of Albertans citing snow skiing as an outdoors recreation activity they had engaged in in 1972; moreover, this figure presumably includes many down-hill skiers.

On the other hand, the City of Edmonton, Parks and Recreation Department, held cross-country ski lessons for the first time last winter and in three programs, 1,064 people registered for lessons. Parks and Recreation could not meet the demand for lessons. To meet the demand next winter, they are planning a much expanded program.

#### e) Horseback Riders

It is interesting that the Parks Canada study found twice as many recreational riders as skiers. (Though probably in part this is accounted for by the fact that some respondents lived in rural areas where places to ride are easier to find than good downhill skiing locations - but likely no easier than good cross-country skiing locations.) The student observers saw no riders - even on a riding trail - but a telephone survey conducted by this Task Force found about 500 horses stabled in the Edmonton area, with about 250 persons taking riding lessons. (See Appendix D.)

#### f) Snowshoers

In the winter, walkers may be aided by snow shoes. While snowshoers can use walking trails, they often prefer to cut across open fields of fresh snow. Well used trails are not suited to snowshoeing. Thus, not being of essentially trail users, this type of user is not considered further in this report.

#### g) Motor User

The Task Force considered yet another type of trail user: the motorcyclist or snowmobiler. It was considered that this type of use was not appropriate to River Valley trails in an urban setting for three reasons:

- 1) damage to flora and possibly fauna disproportionate to the numbers of people using a trail,
- 2) accident hazards if other users wandered onto the motorpaths by accident,
- 3) noise.

Thus, the remainder of this report does not consider provision for the motor user in Edmonton's River Valley trail system.

## 2) PURPOSES OF TRAIL USE

In terms of purpose of trail use, five categories may be identified. No statistics on the primary purposes people have for using the River Valley trails are available to the Task Force, though there are indications that some may have been collected for an uncompleted thesis in Geography. We may, however, surmise from observing the kinds of activity taking place on

the trails and the nature of the trails themselves, that Edmonton's River Valley trails are used for at least four of the five identified purposes.

a) Enjoyment of wilderness and nature, solitude.

b) Exercise, fitness and sport. Use of the jogging trails, for instance, suggests that this purpose is significant on certain Edmonton trails.

c) Getting from one part of the City to another where use of a River Valley trail is of secondary importance to the trip; where a trail fulfills a "connecting" purpose. The path from the High Level Bridge to the 116th Street steps (along the old railway bed above Victoria Golf Course) is sometimes used for this purpose.

d) Education in terms of history (e.g., coal mines, old railways, ferry crossings) geomorphology or biology. The popularity of the book prepared by the Edmonton Anti-pollution Group, Nature Trails in Edmonton, and the preparation of similar pamphlets (e.g., A Guide to the Walterdale Trail, by Cathy Rayment) indicate an interest in learning more about biology, at least, through use of Edmonton River Valley trails.

It is also significant that Edmonton Parks and Recreation conducts nature walks in the River Valley which includes a guided tour of sections of the River Valley ravines by a qualified naturalist. The Department also conducts nature walks for school children.

e) Social experience, the boardwalk or neighbourhood walkway type of activity, where one goes to meet and see others and to be met and seen. The Task Force could think of no clear indicator that this is a purpose for using Edmonton's trails, though in other cities this type of purpose is apparent.

### 3) TRAIL TYPES

Combining various types of user with various purposes for use through the following matrix, one can discern the following types of trails which should be considered in developing a complete urban river valley trail system.

Matrix I

Trail Types by Type of User and Purpose of Use

PURPOSE OF TRAIL USE	TYPE OF TRAIL USER				
	Handicapped	Walkers	Cyclers	Skiers	Riders
Nature	A	AC	F	F	I
Connecting	-	D	G	G?	-
Exercise	A	ACDE	H	H	I
Educational	AB	ABD	FG	AF	I
Social	B	B	-	-	I

These trail types may be described as follows:

- A - strolling
- B - promenade
- C - natural trail
- D - walkway
- E - jogging trail
- F - touring trail
- G - cycle way (some experimentation in using these trails by cross-country skiers to get to the River Valley system or even to other parts of the City might be tried.)
- H - racing trail
- I - riding paths

4) THE DESIGN OF INDIVIDUAL TRAILS

Each of the nine types of trails identified above will have distinctive characteristics in terms of the following design considerations:

- I - safety, physical
- II - safety from crime
- III - aesthetics
- IV - services
- V - ecology
- VI - cost.

The following matrix indicates how each of these design considerations might be related to the varying trail types.

Matrix II

Variations in Design Among Trail Types

<u>DESIGN CON- SIDERATIONS</u>	<u>TRAIL TYPE</u>								
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>
<u>Physical Safety</u>									
Surface:	hard	hard	natural	hard	hard	hard	hard	hard	natural(*)
Slopes:	gentle	gentle	natural	medium	hard	medium	gentle	gentle	medium
Curves:	medium	gentle	natural	medium	hard	medium	gentle	gentle	medium
Width:	medium	wide	narrow	medium	hard	medium	medium	medium	medium
<u>Social Safety</u>									
Patrolling:	yes	yes	no	yes	yes	no	no	yes	no
Lighting:	no	yes	no	yes	no	no	yes	no	no
<u>Aesthetics</u>									
Vistas:	yes	yes	some	no	no	yes	no	no	yes
Natural Veg- etation/ Terrain:	yes	no	yes	no	yes	yes	no	yes	yes
Gardening/ Plantings/ Clearings:	yes	yes	no	yes	yes	no	yes	yes	yes
Furniture:	yes	yes	no	no	no	no	no	no	no
<u>Services and Facilities</u>									
Stairs:	yes	yes	no	no	no	no	no	no	no
Benches:	yes	yes	no	yes	no	no	no	yes	no
Refreshments:	yes	yes	no	no	no	yes	no	yes	no
Washrooms:	yes	yes	no	no	no	no	no	yes	no
Points of Interest Markers:	yes	yes	no	yes	no	yes	yes	no	yes
<u>Ecology</u>									
Passes through ecologically sensitive areas:	partly	no	yes	no	no	partly	no	no	partly
<u>Cost</u>									
	medium high	high	very low	medium	med- ium	medium low	medium	medium high	medium high

(\*) or gravel.

Matrix II is not meant to be definitive; it is to be seen as indicative of the kinds of variations in design which should be considered in planning a trail of one type or another.

THE TRAIL SYSTEM AS A SYSTEM

The design considerations illustrated above are independent of how the various trail types fit together into a system. In this section, however, we are interested in how the various types of trails should also be considered in terms of varying characteristics which reflect their respective roles within the total trail system. These systemic characteristics of various trail types will be based on the nature of the linkages and other relationships among trails within the trail system, the relationship between the Edmonton trail system and external trail systems, (e.g., the Waskahegan Trail) and the relationship between the trail system and other urban features.

1) RELATIONSHIPS AMONG TRAIL TYPES

The relationships among trail types may be considered in terms of what trails should be linked together, what types separated from each other even though located in the same area, and what trail types are not compatible with one another in the same area. Matrix III indicates how these three relationships might be considered in terms of the nine trail types, as identified above in Matrix I.

Matrix III

Proposed Relationships Among Trail Types

		<u>TRAIL TYPE</u>								
		<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>
<u>A</u>	<u>L</u>	L	L	L	L	L	S	S	N	N
	<u>B</u>		L	N	L	S	S	S	N	N
	<u>C</u>			L	S	L	L	S	S	L
	<u>D</u>				L	L	S	S	S	L
	<u>E</u>					L	S	L	S	N
	<u>F</u>						L	L	L	S
	<u>G</u>							L	L	L
	<u>H</u>								L	N
	<u>I</u>									L

L - should be linked to provide circulation among trail types.  
 S - should be separated completely, but may be in close proximity.  
 N - not compatible in same area. Should be well removed from one another.



2) RELATIONSHIP BETWEEN THE EDMONTON TRAIL SYSTEM AND EXTERNAL TRAIL SYSTEMS

The same matrix used to indicate proposed relationships among trail types within the same trail system also can be used to indicate proposed relationships between various trail types within the system and those outside Edmonton, to the extent such trails of various types exist outside Edmonton.

3) RELATIONSHIP BETWEEN THE TRAIL SYSTEM AND OTHER URBAN FEATURES

It is as important that the trail system be properly related to the rest of the urban environment as that the components of the system are related to each other. The two critical issues in the relationship between trail system and remainder of the city are considered to be access to the trail system and barriers to the trail system.

a) Access to the Trail System

The principles which this Task Force proposes should inform trail planning in terms of access are these:

i) Attempts should be made to enable different types of users to get to the trail system using the same mode of travel they will use in the system. This particularly applies to able-bodied walkers and cyclists, but could apply to cross-country skiers and to many handicapped persons as well. In this sense, the trail system should extend into the developed areas of the city. The extension of cycleways is particularly important given the dangers and unpleasantness of competing with automobile traffic on streets. It is also feasible. (See, for instance, the case study on bikeways in Toronto in Appendix D.) Horse riders should be able to get to the stables by foot or cycle as Matrix I suggests.

ii) For many, the river valley trail system will be too far away to walk to (to a large extent, this may be a function of the walker's physical condition). Thus, the trail system and the transit system should be closely linked to enable and encourage travel by transit to the trail system.

This is proposed in view of a number of ecological concerns which lead Task Force members to propose transit usage over automobile usage wherever possible, and because of the specific problems of accommodating automobiles in and around the river valley. Parking lots take up space which could be used for trails or other recreational pursuits.

iii) In some cases, for instance people in wheelchairs, will not be able to use transit. In some cases, it may be too much to expect whole families to take the bus when they can use their own car at a seemingly lower cost. In other cases, cyclists - particularly families with young children - living far away from the trail system may not want to hazard the trip to the system by cycle. In still other cases, it may be just impossible for cross-country skiers to get to the trail system any other way but by automobile. For these reasons, some provision must be made for bringing the automobile to, and parking it near, the trail system. Those types of trails which are most likely to require access to automobile should have the larger parking facilities -- for instance "A" type trails which are expected to see a lot of use by the handicapped. Because automobile driving is not strenuous it would seem that it is not necessary to provide access to the trail system at many different points for those coming by automobile. -- if one is driving three miles for an outing, one can drive six miles.

b) Barriers

The primary barriers to developing the trail system so that all parts are properly linked appear to be roadways, private property and topography.

A number of roadways provide barriers to trails in the river valley. For instance, the roadways in Cloverdale inhibit trail usage between Mill Creek Ravine and the Skunk Hollow area. Such present barriers must be bridged in a way which respects the trail user as well as the automobile; new roadways should take the need for trail continuity into account. (Roadways also incidentally decrease the quality of the environment for trail users.)

In those cases where private property blocks development of a public trail, the selected properties could be acquired (or not re-leased by the City) so as to provide for trail continuity. This does not mean that it is necessary from a trail planning point of view to acquire large areas -- just corridors for locating a necessary link in a certain type of trail.

The major topographic barriers to trail continuity are the river and cliffs. A number of people have suggested pedestrian river crossings at selected locations as being desirable amenities in the trail system. (Other types of users could also be accommodated on such crossings.) At a minimum the present roadway bridges, and any future roadway bridges, should be

designed to accommodate trail users both on the bridge and at the approaches. The locating of trails across other natural barriers such as cliffs should be considered carefully in each case. Again, a sensitivity to the different types of trails and their respective design criteria may allow one to provide certain types of trail links (e.g., natural "C" type trails) while not others.

#### DESCRIPTION OF TRAIL TYPES AS COMPONENTS OF A TOTAL TRAIL SYSTEM

Type "A" trails will have non-slippery surfaces such as asphalt, with gentle slopes; where stairs are included, they should have an alternative slope for wheelchairs; the stairs themselves should be in short flights, with handrailings and resting benches.<sup>(\*)</sup> It is envisaged that the trails will be reasonably well used in the day time so that to a certain extent, a certain amount of social policing is available. However, given the vulnerable position of many of the users, it should be patrolled by wardens or perhaps mounted police. No lighting would be necessary. The trail should be highly aesthetically pleasing, with vistas, through interesting and pleasing vegetation, with pleasantly surprising turns and with opportunities to rest in pleasant surroundings near the trail. The trail should be serviced with washrooms and warm-up spots -- "tea cosies" possibly run by ecologically concerned organizations, at intervals appropriate to the type of user for whom it is designed; picnic sites and perhaps water fountains should be on or near the trail. Appropriately designed markers could indicate and describe points of historical, geomorphological or biological interest. In designing the trails, the necessity of gentle slopes may require a fair amount of cutting and filling where the terrain is not already pretty flat; accordingly, most of these trails will likely be located along the flats along the top of the bank, or perhaps in some places traversing a bank. Cost for this type of trail will be moderately high. The "A" trails will be located throughout the River Valley so as to be as close as possible to residents in various parts of the City. Access to the trails will be provided at numerous points. Good transit service to these points during daylight hours is essential to their being fully utilized. Some parking at certain locations will also be desirable. The "A" trails should easily and pleasantly be available to the person reaching the trail by foot as well.

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(\*) Some off-shoots of the "A" trails should be more natural (though carefully designed) so that, for instance, the blind can enjoy the "feel of nature". (See Appendix D.)

The "A" type trail around Mayfair Golf course, for instance, is difficult to reach by bus and very difficult to reach by foot from residential parts of the City. Within the trail system "A" type, trails should be connected together. Major roadways and deep watercourses should be bridged, and it may be desirable to bridge the River itself. The trails should be well signed; noted attractions along the route might be identified by plaques, etc.

"B" type trails are like boardwalks or neighbourhood walkways where walkers (and handicapped in wheelchairs) promenade or stroll with the idea that they meet neighbours. There probably would only be one "promenade" in Edmonton and this would have little if any slope, be wide, with all-weather, snow clearable, surface. It should be protected from traffic cutting across or immediately nearby, and railings should guard against falling down hills so that families can freely let their children play while leisurely strolling. It should be well lit for night time strolling, and patrolled. Vistas are classically associated with such trails, and the top, or near the top, of the River bank would be an ideal location for such a walkway. The walkway would be a natural focus for Edmonton social life and as such, should be near downtown. It might proceed from say the MacDonald Hotel or Convention Centre through to the Legislative Grounds, or beyond to the Museum. Strong symbols such as these would serve to anchor the trail in image. Services along the way should include washrooms, refreshment stands and points of interest markers. The general mood should be festive though not carnival like. The trail would pass through already heavily urbanized areas, and with proper erosion controls would not result in any ecological damage. The trail would be high in cost for it is to be regarded as a major cultural facility of Edmonton.

Access to the trail would be by foot and bus at a number of locations along the route. It is unlikely that special parking facilities connected with the walk would be necessary or desirable. The walkway would lead into "A" and "D" type trails. The design of the walkway itself would be distinctive such that no special signing is necessary.

Neighbourhood walkways would be miniature promenades bordering a neighbourhood along a ravine; at the bottom of the ravine it might be the interface between two neighbourhoods. It would be designed as a smaller promenade with the same ease of use, and physical and social safety precautions (e.g., railings and lighting), though there would unlikely be refreshment stands.

"C" type trails (natural trails) would be designed for the active able-bodied. As such, these trails will be rough in design and likely will consist of the existing unimproved trails in the River Valley. No special provisions to make these trails safe will be provided. The aesthetic value of the trails will lie in the natural terrain and vegetation through which they pass. In a few cases, trails may be so heavily used that they are ecologically damaging and barriers might have to be attempted to cut down on use. There should be little or no cost involved in up-keep, no services provided. Few of these trails are located downtown (see map); those that are should be jealously guarded. Access to these trails will for the most part be from other types of trails (see chart). Few signs will be posted for part of the attraction of these kinds of trails will be the exploring of them.

Type "D" trails (connecting walkways) should be designed to facilitate walking around the City. They must be surfaced with all-weather materials, wide, with reasonably gentle slopes and well lit. They should be pleasing to walk along, but no special measures need to be taken to improve their value aesthetically apart from making full use of vistas, pleasing street furniture (benches, light standards, railings and stairs). Educational markers would heighten interest in using the trail and would serve general educational purposes. The trails will be located wherever two parts of the City can be joined so as to serve the pedestrian better than through the street system. Present examples are the stairways leading up from Rossdale to downtown; the trail up from the High Level Bridge to Garneau; and to some extent, (improvements would make it much better used) from Oliver to the Legislative Grounds along the old railway bed. The potential of such trails for movement around the City is great if attention were paid to this improvement and linking them up together and with "B" type trails. They will be fairly expensive but well used. Definitionally, they must be easily reached by the pedestrian and lie along present desire lines. Signing will likely add to their use.

"E" type trails are to be designed purely for exercise but in such a way as to take advantage of the sensate pleasures offered by the River Valley. Edmonton already has such a trail now in the Kinnaird Ravine. By linking the trail to connecting pedestrian and cycling trails, exercise in getting to the jogging trail is encouraged.

"F" type trails are touring paths for cyclists which should be hard surfaced, have reasonable slopes and curves, avoid precarious locations (e.g., along the edge of steep banks), be naturally pleasing in terms of vegetation and vistas, and ecologically respectful. In winter, they could be used by touring cross-country skiers. They will be medium in cost. The cycle paths will likely be located so as to run through ravines and along the top of the bank and on the flats. They should be connected to other bicycle ways in the City and be connected to type "G" trails. Signing would be useful and the paths could be designed so that services along type "A" trails could also serve these trails without the trails themselves conflicting with one another.

Type "G" trails are for the cyclist as the "D" trails are for the pedestrian. Frequently, type "G" trails would be parallel, though usually not employing the same lane. The "G" trails would be of essentially the same design as "D" trails though with greater precaution for gentler slopes and curves than are necessary for the "D" trails.

"H" type trails would be designed for the cyclists or cross-country skier who wants to enjoy speed and to exercise more intensely than the tourer using the "F" type trails. The surface should be hard and well maintained; there should be no obstructions to sight over long distances ahead. This would indicate that the trails should avoid ecologically sensitive areas; resting spots should be provided and through connections with the "F" type trails access to basic refreshment and washroom facilities. Such trails would have to be patrolled for the safety of legitimate users and wanderers from other trails.

The "I" trails, horse trails, would best use natural surface, though in places of heavy use and in certain areas (for instance near banks and in depressional areas) the trails might have to be provided with a sub-surface. The trails could have some steep slopes and tight curves though not so steep or tight as in the "C" type trails. The trails should not have to be patrolled, nor serviced with refreshment stands, etc., as these could be provided at the stables, and riders often enjoy taking along their own lunch. The trails should be interesting through vistas and natural vegetation but with clearings along the way where one could dismount. Special precautions would have to be taken in ecologically sensitive areas which such trails probably would pass through.

The horse trails should be well away from the strolling paths ("A" trails) and promenades ("B" trails), linked to some natural trails ("C" trails) for the rider to explore when dismounted. They should be separate from bicycle paths ("F"). However, at the stable, they should be linked to the rest of the City through connecting walkways ("D") and cycle ways ("G"). Access to the trail system will in general be through the stable and public transit should be available.

#### DEVELOPMENT OF THE SYSTEM

Development of the River Valley trail system involves four stages:

- a) research
- b) planning
- c) implementation
- d) evaluation and redesign if appropriate.

#### 1) RESEARCH

Some more research would be required to determine more accurately the number of different types of users and purposes of use. It will not suffice to find out more about current Edmontonians' habits; investigation of practices elsewhere that have tended to encourage or discourage one use or another will also be necessary. For instance, provision of a cycle trail system would seem, based on the cycle-ownership figures provided earlier in this report, to increase cycle use; it is not surprising that this should be the case. Research on details of trail design is also necessary -- for instance, on surfacing materials, maximum slopes for different types of users, marking methods for the blind, as well perhaps, as sociological data on what constitutes a feeling of unpleasant crowdedness on different types of trails. (Some of these kinds of data which should be collected is indicated in Appendix C.) Finally, local data on the topography, soils and flora of the Edmonton River Valley needs to be collected.

## 2) PLANNING

Trail planning should of course make full use of the data collected in the research stage. In addition, the planning process should involve extensive consultation with various types of trail users. The kind of interest users and potential users might be expected to have in being involved in the trail planning process is indicated by such events as the Department of Extension's River Valley Caucus and Practicum, the Alberta Government Recreation Committee's Recreation Trail Seminar, held in St. Albert, January, 1974, etc. Though citizen involvement in planning always is time consuming and involves some expense, the pay-offs are great in terms of design attuned to the wants of the persons affected, and partly as a result often in terms of great future financial savings. The trail system planning exercise could be a great community event involving people from all over the City, each person involved offering a certain expertise in terms of types of trail use and local river valley knowledge. While expert input will obviously be required on technical details of design (e.g., on slope stabilities), and while ultimately the plan will have to be acceptable to the appropriate City authorities in terms of cost, and effect on other city developments, the nature of the trail planning exercise is not so technical that many cannot effectively contribute. And this exercise is one in which people will be able to see the direct results of their work -- perhaps in the smallest details of design. This will encourage a pride in the River Valley trail system and encourage proper use and maintenance. There are not many opportunities in a city for such city-wide citizen involvement in planning a facility.

## 3) IMPLEMENTATION

Implementation of the plan will generally be the responsibility of Edmonton Parks and Recreation, but here again there is an opportunity for citizen involvement. It is just possible that some of the individuals and groups involved in planning the trail system will be interested in helping to develop certain portions of it -- some of Edmonton's trails were originally constructed by volunteer work bees organized by groups, for instance, of cross-country skiers. Since it is unlikely that funds will be available to develop the whole trail system at once, the system must be designed to allow staging such that the systemic nature of the trail network is to the greatest extent possible present from the beginning.



#### 4) EVALUATION

It is likely that no matter how much research is carried out and how much creativity and citizen input goes into the planning of the system, the system will need to be modified from time to time. Mistakes will be made, certain innovations will prove dysfunctional to the system in time, external impacts on the trail system from natural (e.g., slides) or city development sources may cause disruptions, and patterns of use may change as different types of activity gain or wane in popularity. Thus from time to time the use and upkeep of the system will have to be monitored. Here again, citizen participation in evaluating the system and in redesigning it will likely improve the redesign, be financially thrifty in the long run, and serve to encourage citizens to feel a part of their community.

Each of the stages in development of the trail system will cost money no matter how carefully the data is collected, the system is designed, and volunteers are used along the way to reduce costs. It is the proposal of the Task Force that such funds will be well spent; that it would be better to spend money for development in this way than in the acquisition of large new tracts of (presently developed) river valley land which cannot be carefully and creatively used because too much money for parks development is being spent on acquiring land. There is much open land now in the river valley available for the development of trails.

#### MAINTENANCE OF THE TRAIL SYSTEM

The Task Force addressed itself to the problems of upkeep on the system to ways of ensuring that trails are properly used and maintained. Three aspects of trail system maintenance were considered: education, signing and enforcement.

#### 1) EDUCATION

Education in trail etiquette was considered by the Task Force to be important enough to trail maintenance that it warranted being taught in the schools. Of course, an explanation of the reasons for trail etiquette would involve considerations of ecology and sociology and thus education in trail

etiquette would be broadly relevant to a student's development. Other kinds of public education programs regarding trail etiquette might be worthwhile as well.

2) SIGNING

Signing on trails would often be necessary to indicate the type of trail being used and perhaps in some cases for direction. Besides advising as to the proper type of users for a particular trail, trail signs could also aid trail maintenance of instructions on etiquette, measures to take to preserve ecologically sensitive areas, etc. However, because too many signs detract from trail enjoyment, as much maintenance should be ensured through education as possible.

3) ENFORCEMENT

Enforcement will also be necessary in some cases -- for instance, where there is evidence of illegal or dangerous uses of a certain trail type. Enforcement procedures can be combined with safety (social and physical) patrols. The park warden concept might be as appropriate to Edmonton's river valley trail system as to the National Parks. Concerned groups, particularly those involved in planning and developing the trail system, might also be involved in enforcement -- not with police powers but as watchdogs such as ski patrols.

CONCLUSION

The Task Force came together on the assumptions that the River Valley trails offer much to Edmonton and could offer still more, that the trails should be designed to meet to the greatest extent possible the variety of needs and desires of Edmontonians, and that the trails should be designed to respect the ecological conditions in various parts of the valley while recognizing that this is a river valley running through the centre of a large city.

As a result of its deliberations the Task Force concluded that taking a system approach to river valley trail planning would allow one to develop the trails in a way which met all of the above assumptions. The system approach recognizes the systemic nature of the valley itself, the urban system of which the valley is a part, and the possibilities for relating the various components of a trail network in such a way that it becomes a system in which each part (trail) augments or at least respects the role of other parts.

The Task Force concluded that essentially five types of users (handicapped, walkers, cyclists, cross-country skiers, and horseback riders) and five different purposes a person may have for using a trail (natural experience, exercise, getting around the city, education and socializing) have to be considered in planning for different types of trails. Combining types of user with different purposes for use indicates that nine different types of trails might be considered. Each of these trail types has different characteristics in terms of design which is appropriate to user type and purpose, and in terms of role in the trail system's internal and external relationships.

Using such a system approach in the development of a trail system in the Edmonton river valley offers many opportunities for creativity and citizen input at all stages (research, planning, implementation and evaluation) of the development process. Maintenance of the trail system as a system which really meets the needs it is designed to meet will involve taking measures such as formal and public education, signing, and trail patrols.

The Task Force has not attempted to present a fully planned trail system for Edmonton, though it has undertaken some exercises in designing such a system for its own heuristic purposes. Rather, the Task Force offers an approach to planning river valley trails in an urban environment, a systemic approach, which it believes could provide all Edmontonians with one of the most exciting opportunities for outdoor recreation to be found in any city anywhere.

APPENDIX A

THE EXISTING RIVER VALLEY TRAIL NETWORK

Appendix A, Edmonton Trails, by Ben Buss, a member of the River Valley Trails Task Force provides the most complete description of the existing trail system in Edmonton to be found. More detailed information on certain major trails is found in Nature Trails in Edmonton, by Touchings, Mills and Abercrombie (Edmonton Anti-pollution Group, 1973).

## APPENDIX B

### GOVERNMENTAL POLICIES REGARDING RIVER VALLEY TRAILS

Most of the attention to River Valley trails comes from the City of Edmonton, particularly from Edmonton Parks and Recreation. The Edmonton Regional Planning Commission indicates no interest in design at the scale of individual trails. The interest of the Province is confined to Capital City Park, the details regarding which are not yet known.

Edmonton Parks and Recreation classifies the trails as improved, unimproved, future trails and future ties to subdivision walkways and residential sidewalks. Improved trails are defined as cleared, having a gravel or chipstone base and signed.


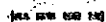

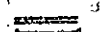
It is interesting that some of the trails deemed worthy of description by Nature Trails in Edmonton are not indicated by Parks and Recreation to be "official" trails in the Edmonton Parks and Recreation Master Plan 1970 - 1980 (for instance, the McKinnon Ravine Trail).

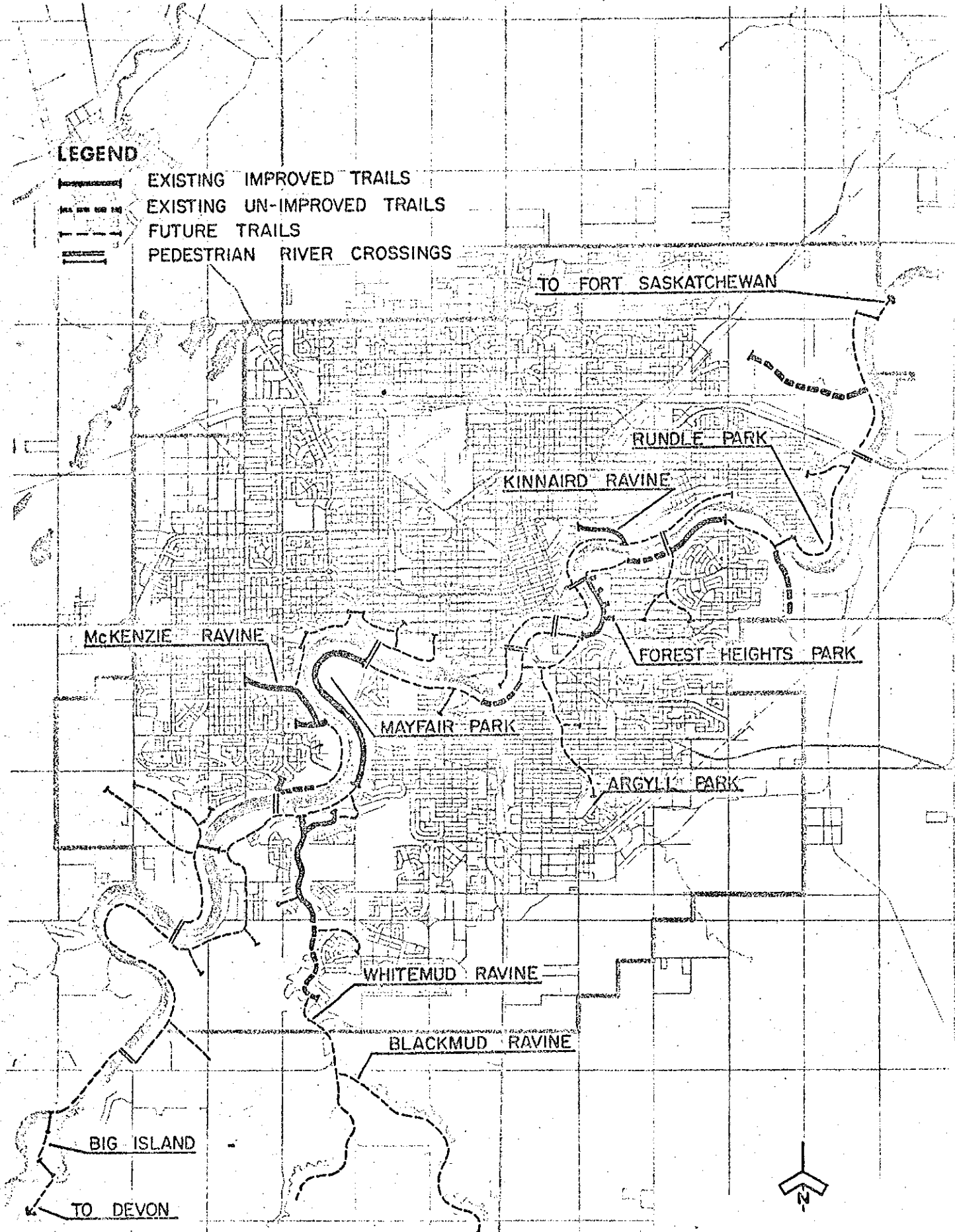
The Master Plan also refers to a trail system, but this system is inadequate from the perspective of the system approach to trail planning proposed in this report, for three reasons:

- a) The Master Plan system does not differentiate among types according to type of user and/or purpose of use. Indeed, though existing trails are separated into improved and unimproved, there is no categorization of future trails at all.
- b) The proposed system is incomplete, being shown on a very small scale map and on which the trails appear almost schematic; this is in marked contrast to the detailed examination of the present trail system by Ben Buss. Certain ravine trails are shown as truncated in the Master Plan, not just where ravine roadways were being considered at the time the Master Plan was produced (e.g., McKinnon), but in other ravines as well (e.g., Ramsey). Critical links in a contiguous system of trails are missing (e.g., from the Fifth Street Bridge to the Royal Glenora).
- c) As a consequence, perhaps, of not being concerned about trail categorization and of the very broad consideration of the system with no attention to trail detail or completeness, there is no analysis in the Master Plan of trails in terms of their environment, ease of use, etc., and therefore, no prescription for trail development, maintenance, servicing, patrolling,

etc. The Task Force is hopeful that the kind of approach recommended in this report will lead to a more intensive investigation of the present trail system and the development by Parks and Recreation of a more finely drawn and imaginative plan for the trail system than the Parks and Recreation Master Plan currently provides.

**LEGEND**

-  EXISTING IMPROVED TRAILS
-  EXISTING UN-IMPROVED TRAILS
-  FUTURE TRAILS
-  PEDESTRIAN RIVER CROSSINGS



**PROJECTED RIVER VALLEY TRAIL SYSTEM**

Source: Edmonton Parks and Recreation, Master Plan 1970 - 1980, Chapter 6, Figure 20.

APPENDIX C

INFORMATION ON TRAIL STANDARDS

The main body of this report indicated a number of design criteria for different types of trails. There was no attempt in this report to be precise or quantitative in terms of establishing design criteria. There are reports available, however, from a number of sources which specify such criteria. The following are excerpts from some of these reports.



## TRAIL DEVELOPMENT FOR HANDICAPPED PERSONS

Submission from the Edmonton Regional Committee on Recreation for the Disabled -- October 5th, 1972.

- A. There is a need for trails for physically handicapped persons. To our knowledge, there are presently no existing trails which would accommodate such persons.
- B. Types of trails
1. Trails are to be accessible to various types of handicaps, including wheelchairs.
  2. Snowmobiles could be used on "handicapped" trails during the wintertime.
  3. Trails for handicapped could be used by entire family, thus providing one source of family recreation which would include the handicapped member.
  4. Persons must be kept away from physical danger.
- C. Degree of development required.
1. Asphalt trail or another surface trail that would support wheelchair traffic.
  2. Washroom facilities large enough to include wheelchairs.
  3. Parking facilities convenient for wheelchairs.
  4. A section of a trail could be so designed to be accessible to wheelchairs and the rest of the trail extended for others' use.
  5. A winter and summer pavilion would be desirable in order that the handicapped person may have a place to wait while others continue their activity on the trail.
- D. Regarding policy formation
- Consideration should be given to the handicapped minority in policy formation.
- Further details regarding technical requirements can be submitted from this committee.

# HIKING TRAILS

From the Bruce Trail Manual

The Trail Manual is designed to supply working instructions and information for the standard construction of the Bruce Trail. Subsequent instructions on special aspects such as campsites, shelters, etc. will be issued as required. Most of the material in this manual is culled from the Appalachian Trail Manual, representing experience accumulated over many years.

## General Principles

The Bruce Trail is designed for foot travel and is primarily for the purpose of affording pleasure and recreation. It follows the general line of the Niagara Escarpment and it should connect as many points of beauty and as many high places affording wide views of the surrounding countryside as is possible.

In the construction of the Trail, the following points should be remembered:

1. Avoid grades of more than 20%, as hikers carrying packs will be using the Trail and will tire on steeper slopes.
2. Avoid roads used by traffic, if this is possible. Sometimes these roads will be the only route and then they will have to be used.
3. Avoid repeated crossings of a stream and use existing bridges where possible. Bridges will have to be built where none exist.
4. Avoid areas which are marshy at any time of the year.
5. Avoid areas with dense annual growth, as maintenance can then be a major problem.
6. Avoid the bases of cliffs, as the original development of the Trail can be difficult due to the presence of large boulders. Upkeep is also made more difficult.

7. Avoid buildings and cultivated land as much as possible.

Preference in the choice of route should be given to open and mature timber with little undergrowth. Sources of drinking water are essential on the trail, and the trail should always be located to pass any known source. Eventually there will be camping sites at intervals of approximately 8 miles and, at these places, good water is imperative. The time to find these sources of water is when the trail is being built.

Care should be taken to avoid fire hazard and damage to fences and other property. Gates and bars should always be closed after passage. A frequent source of ill will is the destruction of fences by hikers. Objection on this score can be anticipated and obviated by an agreement with the landowner that part of the construction of the Trail shall consist of the erection of stiles over fences.

Owners of land should be interviewed after the location of the trail, but before any cutting or marking is undertaken. The nature and purpose of the trail should be made clear to them, with a request to be allowed to cut and mark the route.

Satisfactory use of the trail, including permanence of trail markers, permission and facilities for camping, and assistance in need, depends, to a very large extent, on the goodwill and co-operation of the landowners and residents along the route. Obviously such goodwill and co-operation should be reciprocal, and good trail manners and courtesy are essential. It should also be remembered that, since the trail must be continuous, careful consideration should be given to ensuring that each link properly contacts the next. This can best be achieved by

co-operating individuals or groups first contacting the Bruce Trail Association for directions.

### Locating the Trail

With the "General Principles" in mind, control points such as road intersections, bridges, summits, etc., should be selected. The area between the control points should then be walked over and the best route chosen. Sometimes, by reconnoitering at right angles to the proposed route, a satisfactory path, going in the direction of the trail, can be found.

The best way to mark the located route for the construction party is by stringing. This is done by carrying a cone of grocer's white string (which averages about a mile to the pound) on a short stick and letting it unravel as you advance. The string can be more easily followed if it is occasionally hung from branches, and it can be easily removed if this becomes necessary. White or colored rags can also be used to mark the route temporarily.

The stringing can best be done by three people, the most experienced in the centre and the others on either side within hailing distance. When necessary, they can come together for consultation. The entire section of the trail should be located before any construction is undertaken. Locating the trail is easiest when there is little foliage on the trees or on the ground.

### Clearing

CROSSLOGS: Always remove. First make a cut at the side of the trail and it may then be possible to move the log. If this is not possible, a second cut will have to be made. Avoid short-cutting whereby the ends of the

log still narrow the width of the trail.

SMALL TREES: It is better to remove small trees growing along the edge of the trail than to try to prune them. They should be cut out completely, as stubs cause stumbling and also tend to sprout.

BRANCHES: Cut close to the trunk. Cut all branches within reach and two-thirds of the way round the trunk.

BRUSH: Cut everything that obscures the footway and cut wide. A wide trail is less easily obscured by brush growth.

GRASSES, FERNS, LOW BUSHES, WEEDS: Remove wide enough to clear the footway and prevent wetting the feet with rain and dew. Disturb the soil as little as possible to prevent erosion.

WIDTH OF TRAIL: Depending on the type of growth encountered, the trail should be from four to six feet wide and it should be cut wide enough so that nothing touches the hiker and so that it will not grow in for several years. In scrub, where rapid growth is particularly troublesome, cut to double width.

HEIGHT OF CLEARING: Cut as high as can be reached, as snow and rain will weigh down the branches. Branches which will clear the head will often obscure the vision of someone travelling downhill. Be on guard against the tendency not to cut high enough when working uphill.

CUTTINGS: Cuttings must not be banked at the edge of the trail, on account of the fire hazard. They should be thrown well out and scattered and, when constructing the trail, two people should be given this job, following the main work party.

## Marking

### A. Blazes

The tree blaze is the primary route-finding method of marking the Bruce Trail. To assure permanency, the blazes are painted and particular effort should be made to avoid the disfigurement caused by too-large, improperly placed, and too numerous, blazes. On the other hand, under-marking by reason of insufficient blazes is inexcusable.

The marking should be unmistakable, permanently indicating the trail, and should be continuous. There should be no gaps in the marking. Blazes should be made on trees prominently placed and which strike the eye. The blazes should always be well placed at eye level.

The standard blaze is 6 in. long and 2 in. wide (no more) and is placed vertically on the tree. This shape is much more effective than other shapes such as a bulls-eye. Blazes are put on in a fore and aft direction, the same as markers on a highway. Blazes parallel to the trail are of no value and can easily be misleading.

The frequency of paint blazes depends on the nature of the trail. On narrow woodland trails, blazes should be visible from each other. On well-worn woods roads, blazes can be placed farther apart, depending on the nature of the terrain. It is a prime essential that, immediately beyond any crossing road or trail, there be a trail indication. As this blaze may become obliterated, it is wise to have a second blaze 50 or 100 ft. beyond the crossing.

Do not fail to mark a trail because of the thought that no one could possibly get lost in that area. Conditions on the

trail can easily change by activities such as lumbering. There should not be a sudden change in the frequency of the blazes, as continuity of the markings is essential to an assurance that one is following the proper route of the trail.

At important changes in the route, such as where it turns into a less well-defined trail or road, there are used two unconnected blazes of the prescribed size, one above the other, at right angles to the trail.

To insure adequate and proper spacing, trail blazing should be treated as a separate job in each direction; the blazes should be painted in one direction and then in the other. When possible, the same tree should not be used for blazes in both directions, a destruction of the tree means a two-fold loss.

Making the Blaze: The surface of the tree should first be prepared. Experience has shown that smoothing the bark produces results superior to the old method of making a blaze by completely removing the bark. The easiest method of preparing the bark is by using a hardwood floor scraper with a 2½ in. blade and a 6 in. handle. These are easily obtained and can be carried slung over the shoulder by a thong through a hole in the handle. Occasionally, when the bark is very hard, the initial smoothing must be done gently with an axe. The bark is smoothed over an area the size of the blaze. This makes a neat blaze and prevents the paint from running.

The standard color of paint used in the Bruce Trail is white. This has been shown to stand out the best in all types of country, although where birches are prevalent, its efficacy may be a little reduced. Any good white out-door paint can be used.

Blue is used to mark any side trails to view points, water, supplies and the like.

Renewing old blazes is necessary from time to time. Rescraping should always be done and then paint applied. If the old blaze has been partly obliterated by new growth of the bark, it is better to obliterate the old blaze and make a new blaze on a different tree.

All old blazes which are not to be renewed should be obliterated with a paint which blends with the colour of the bark. If a trail is to be relocated, all old blazes should be neutralized. A mixture of brown and dark blue paints normally produces a much more satisfactory neutralizing colour than an ordinary brown paint. Occasionally, with the passage of years, the neutralizing paint will wear away and will expose the original blaze. More neutralizing paint will then have to be applied.

## B. Markers

The Bruce Trail markers are the insignia of the route, and these metal markers may be obtained from the Bruce Trail Association.

These metal markers should be placed at eye level, in the same manner as the paint blazes, and they should be conspicuous and should never be at right angles to the trail. They are intended for use

along the trail at regular intervals. Under ordinary circumstances, four markers to the mile are sufficient, but, if vandalism is expected, more markers should be used.

At all intersections of the trail with other trails, wood roads and highways, there should be a Bruce Trail marker on the trail route on either side of the intersection, with the face of the marker clearly visible from the intersection.

Markers should never be placed on the poles of telephone or electric power companies, as they may cause a linesman's spikes to slip, and therefore the markers would be removed.

The markers should be fixed with two galvanized nails, or if vandalism is expected, by four nails. One half inch of the nail should be left protruding to allow for the growth of the tree.

## C. Cairns

Cairns are used to mark the trail when trees are lacking. A cairn should consist of a pile of stones built in a manner which is obviously artificial. Do not build too small a cairn, as often in areas where cairns are necessary, there is a large annual growth of grass and this can easily obscure the cairn.

A cairn should be tested for sound construction by giving it a push equal to the force of a gale. In sections where grazing takes place, cattle may demolish the cairn. This can be avoided by using larger stones.

Occasionally rocks can be blazed to indicate the route of the trail, but

these should be used only if the rock is in every way suitable. The marking of rocks on the ground is useless, as, at different seasons of the year, they may be covered by snow or fallen leaves.

#### D. Signs

Signs should be placed at the principal points on the trail; in particular, where highways cross the trail. Signs, giving the following information, can be obtained from the Bruce Trail Association:

1. The name: The Bruce Trail
2. A walking trail along the length of the Niagara Escarpment.
3. The address from which information can be obtained.

In addition, a second type of sign should be used, giving the approximate distance to the next objective on the trail. Similar signs should be used for any side trails. These signs will have to be constructed locally, and are best made of white pine, basswood, poplar, or some other soft wood which will hold paint well. Boards should be  $\frac{1}{2}$  in. thick, the background being preferably white, although blue or orange is acceptable, with plain Gothic (block style) lettering in black.

The average length of life of a sign is about 7 years and it can then be either mended or replaced. Sometimes the appearance of a sign in the field can be greatly improved by wiping it with a wet cloth.

#### Upkeep of Trail

The whole length of the trail should be checked at least once a year and any

necessary maintenance performed. If the annual growth is heavy, the trail should be checked at least twice a year.

Flashes will probably have to be renewed every 3 years and very few will last more than 5 years.

Replacement of markers and signs should be undertaken when necessary.

#### Tools

In general, the most serviceable trail-clearing tools are a long-handled axe, long-handled pruning shears (33 in., not hedge clippers) and a weeder.

After the initial construction of a trail, maintenance problems can be cared for by use of pruning shears and a weeder. The shears are used to remove sprouts and branches. The weeder is a light weight tool, which serves in lieu of a scythe to eliminate the obscuring summer growth and to present a wide open trail. The axe or saw is the third essential to cut out blow downs.

AXE: A single-bitted  $3\frac{1}{2}$  lb. axe is the most suitable, but individual preferences vary widely. Only experienced woodsmen should use a double-bitted one. The axe should be kept sharp.

CARBORUNDUM: A round stone, coarse and fine combined, is the best for field use.

PRUNING SHEARS: Handles should be about 33 in. long. Use the shears on live wood only, cutting at an angle. Do not use them to knock off dead stubs and do not twist them. Constant care must be exerted to cut close to the ground and avoid leaving stubs.

WEEDER: It is essential that the blade be kept sharp for the removal of herbaceous growth.

SAW: The orthodox cross-cut saw has been

largely replaced by the one-man Swedish pulp saw. Cover the teeth with burlap to prevent damage, if carrying for a distance.

WEDGES: A hickory, oak, or iron wedge for use with the saw is essential.

GLOVES: Remember to have a pair with you, if you are not used to manual work.

Other tools, such as scythes, bush-hooks, machetes and mattocks, may be useful, but are not essential. A light-weight mattock can be employed to remove roots from the path.

When organizing a work party, one should remember that sometimes tools break and spare handles and chocks for axes, etc. can be carried, if one deems it necessary. Individuals should experiment with the best type of paint carrier before going into the field.

## BICYCLE TRAILS

Prepared for the Department of  
Culture, Youth and Recreation

Province of Alberta, May, 1973

Compiled by Dale Schulha

#102-13148-65 Street  
478-5803

Bicycling has undoubtedly become one of the most popular leisure-time activities in North America. In the past four years especially, the number of bicycles travelling our streets and highways has increased tremendously. The most significant increase has been in the number of adults engaging in this life-time sport.

People from all walks of life are using the bicycle not only for recreational purposes, but also as a mode of transportation to and from work. When viewing the advantages of bicycling, it can be seen that the bicycle offers:

1. No pollution
2. Low upkeep
3. No noise
4. Small space use
5. Reliability
6. Non-congestion
7. Healthful exercise
8. Enjoyment

As a result of the encompassing interest shown in bicycling, it becomes apparent that bicycle trails or paths must be constructed, especially for recreational use. It should be noted that in various parts of the United States special bicycle trails have been constructed to serve the needs of workers in congested city centers. However, it does not appear that the need for this type of construction is warranted in Canada as yet.

A variety of recreational bicycle trails have been developed. Some trails have been constructed from abandoned railroad tracks and extend for miles. Other trails have been constructed in scenic forest locations, in both urban and rural settings, and vary in length from one to ten miles. Irregardless

of the type or length of the bicycle trail, there are some basic principles which are usually followed in the construction and operation of the trail. These principles are covered in the ensuing literature.

### General Principles

Bicycle paths should be located in areas promising a high degree of utilization of the paths.

The highest bicycle "population" can be expected in residential areas where comparatively easy physical access to bicycle storage such as garages, sheds and basements is available. Single family dwellings and row houses fall into this category, apartment blocks may not.

The paths should lead, if possible, to activity centres such as beaches, picnic grounds, horticultural display areas, schools, employment centres, etc.

Between origins and destinations, as described above, the path should introduce the bicyclists, where possible, to interesting land forms, variety in vegetative cover, water courses and historic sites. This can make it visually worthwhile to ride just a segment of the bicycle route.

In order to avoid the monotony of long tangents, the path should follow a curvilinear alignment in harmony with the topography and existing tree cover. Supplementary planting may enhance the overall appearance and serve as a visual or noise buffer.

Pleasant views can be emphasized by leading the path into their direction for a short distance. A conscious effort should be made to leave a significant amount of



vegetation in its primitive state. This is especially effective along riverbanks and old hedge rows where grass cutting and underbrush clearing may remove distinct characteristics.

### Path System

Most bicycle paths should be interconnected within the comprehensive path system. Where direct connection is not possible, parts of the parkway and street system may be utilized as a link. However, arterial roads should be avoided because bicyclists are incompatible with high speed, high volume traffic.

Loops within a system would enable those who are out for a ride of several miles to return by a different route. This could offer several subsystems to the user and so make the overall system more attractive. The location of the loops depends mostly on the availability of routes for the purpose.

The usefulness of the loops depends on the successful match of their lengths to the length of the average pleasure ride on a bike. This length is estimated to be between 3 and 6 miles. The estimate excludes the habits of advanced bike riders as well as those of beginners. (The advanced bicyclist can travel several loops while the beginner can travel part of a loop and return via the same route.)

Entry points to the path system will be planned in some cases, while in others they will happen as a result of the path crossing a street. Existing desire lines should be considered.

Each section in the overall system should have a name distinctive of the locality the path runs through. The name should be posted along the path to identify the section. Where streets are used as part of the path system, the signing

should continue along the street. Maps and displays should indicate the various routes and sections to the users.

### Type of Use

#### One-way exclusive bicycle paths

Where a separate pedestrian path or sidewalk is located nearby and where a bicycle return route is also in close proximity (e.g. location between sidewalk and street surface on each side of the street.)

#### Two-way exclusive bicycle paths

Where separate pedestrian path or sidewalk is located nearby (e.g. independent alignment along parkway also served by separate footpath.)

#### Combination two-way bicycle and footpath

- a) New construction in areas not previously serviced by a footpath. Alignment independent of parkways where possible.
- b) Existing footpaths converted by widening, re-alignment and reconstruction of road crossings and sufficient clearances.

#### Combination parkway and bicycle path

Any parkway with a legal speed limit of 25 m.p.h. or less can be used by both cars and bicycles without abnormal danger to bicyclists. Those parts of a parkway used as connecting links in the path system could be signed by suitable guide signs.

### Combination street and bicycle path

Local or collector streets with a legal speed limit of 30 m.p.h. or less can be used by both cars and bicycles without abnormal danger to bicyclists. Arterial roads with high volumes of traffic should be avoided if possible. Those parts of streets used as connecting links in the path system could be suitably signed.

### Competitive Tracks

A bicycle race track consisting of a loop can be used to promote bicycling and bicycle racing. The loop should have sharp, super-elevated curves and a length suitable for racing events. Facilities for spectators such as parking, toilet facilities, concessions might also be considered.

Park benches should be provided along existing and proposed paths. These can be integrated into overlooks, points of interest, etc.

### Design Standards

#### Width

A bicycle is approximately 2 ft. wide. Since a bicycle does not move in a straight line as a four-wheeled vehicle does, additional width has to be allowed for the swinging movement caused by the effort to balance the bike. The total effective width of one lane should be 3½ ft.

A two-way path must be constructed at least 2 lanes or 7 ft. in width. A one-lane path allows only traffic with no provision for passing and is not generally recommended for a new construction. If bicycle traffic becomes very heavy, a two-lane path can be widened into a three-lane path (10 ft. wide) to accommodate three lanes of traffic.

Existing footpaths to be converted into combined-use bicycle and pedestrian paths should be widened to 7 ft. minimum.

#### Clearance

Fixed objects (e.g. trees) should be clear of the edge of the path proper by at least 1 ft.

Minimum overhead clearance (e.g. at underpasses or under tree branches) is 7 ft. However, an overhead clearance of 9 ft. is desirable for reasons of visual appearance, etc.

Railings should be set back 1 ft. from the edge of the bicycle path to allow for a safety margin, because of the proximity of handle bars to the railings.

Where fences have to be crossed, the opening must be at least as wide as the path but should preferably be one foot wider on each side.

#### Grades

Long grades should not exceed 3%. Short grades (up to 300 ft. long) should not exceed 4%. Any grade steeper than these will force most bicyclists to push their vehicle.

Long steep grades should not follow a straight alignment.

If topography demands the construction of grades steeper than those described, two one-way paths should be used. The downhill path should not be steeper than 6% and its curves should be super-elevated. The uphill path can be considerably steeper and shorter, and the distance to push the bike uphill will therefore be reduced considerably.

#### Alignment and Super-elevation

Curves on a bicycle path may be quite sharp, provided they are super-elevated.

In regard to superelevation, two groups of paths should be distinguished:

- a) Those built to a gradient of 0% to 3%. An average downhill speed of 12 m.p.h. is expected on these segments of bike paths. The sharpest curve may have a radius of 35 ft. and must be superelevated at the rate of 0.10 ft. per foot. Superelevation ceases at 70 ft. radius curves.
- b) Those paths built to a gradient of 4% to 6%. An average downhill speed of 18 m.p.h. is expected on these segments of bike paths. The sharpest curve may have a radius of 80 ft. and must be superelevated at the rate of 0.10 ft. per foot. Superelevation ceases at 150 ft. radius curves.

On steep one-way uphill sections, curves may have a radius of less than 35 ft. and superelevation is not required.

#### Surface and Drainage

To be attractive to bicyclists, paths must have a surface which offers smooth riding qualities combined with good frictional resistance to tire slipping. H.L. 3 asphalt offers these qualities (H.L. 6 would give a rough ride while H.L. sand mix may cause tire slipping when the pavement is either wet or covered with a layer of dust.) However, a well compacted gravel surface, free of potholes, is acceptable and often useful as a break in the monotony of the surface.

Bicycle paths are not designed to carry heavy vehicles. 2 in. of H.L. 3 asphalt over 6 in. of Granular "A" will, in most cases, carry a service pickup truck while the subgrade is not saturated with water, i.e. June to October. During the remainder of the year, heavy vehicles should be kept off the pavement.

The paths can be drained by a cross slope of 0.02 ft. per foot. This may be applied according to topography. Water from a small area adjacent to the bicycle path may drain across the path. Small areas drain fast and little water would be expected to run across the path after a rainstorm. Water from large areas having the tendency to drain across the paths should be collected in swales alongside the paths. Ditches having steep slopes should be avoided.

#### Signing

Regulatory signs should generally conform to the system of signs advocated by the Canadian Good Roads Association to their Manual of Uniform Traffic Control Devices for Canada, although this manual does not specifically list signs applying to bicycle paths. Symbolic signs are preferred to worded signs.

Bicycle paths are not intended for use by motor vehicles of any kind. This regulation can be enforced only if signs indicate it at all points of entry to the bicycle path system. The sign recommended for this purpose shows the black outline of a bicycle on a white background inside a green circle. This sign should be mounted on a post so that it can be clearly seen by motorists and bicyclists alike.

Because of physical difficulties which would be encountered in widening paths and relocating park benches, not all existing footpaths may be converted to combined use by pedestrians and bicyclists. At points where exclusive footpaths diverge from bicycle paths, signs prohibiting bicycles would clarify the situation. The sign recommended for this purpose shows the black outline of a bicycle on a white background crossed by a red bar inside a red circle. This sign may be mounted on a post or painted on the asphalt of the path, the choice depending on best design.

Guide signs indicating the name of a particular section of the path system should be erected at junction points of sections and at all external points of entrance to the system. They could also be used to identify streets forming part of the path system

Guide signs should be smaller than regulatory signs because their message is not intended for the passing motorist but for the bicyclist travelling at low speed. All guide signs should be erected on posts, most of them underneath the regulatory sign described above, others alone at junctions of different paths. The latter might have to be supplemented by arrows.

Names of path sections for guide signs should be distinctive to the area traversed.

### Safety

Street crossings at grade constitute a hazard to bicyclists. High volume traffic arteries should be crossed at traffic signals only. Parkways and medium volume streets may be crossed at intersections or at midblock provided the crossing is at right angles and protected by signs on the bicycle path. Freeways must be crossed by means of an overpass or an underpass. An alternative to a separate structure would be to use an existing street overpass or underpass, if this does not have serious disadvantages e.g. dangerous crossings of freeway ramps, high traffic volumes on the street, very long detour, etc.

Bicycle paths adjacent to deep water or very steep slopes warrant a railing to protect riders. Where there is sufficient room between the path and the hazard, dense planting of resilient shrubbery can fulfill the role of the railing.

### Bicycling and Health

Fitness experts recommend bicycling for physical conditioning, increased circulation and muscle tone, as well as for general good health and recreation. Standard bicycles are a means to allow patients of hospitals to get out in the fresh air.

Bikeways across communities are one means of providing the proper facilities for "preventive medicine." With such facilities strategically located to improve the environment, it will be easier and more pleasant for people to improve their own physical well-being.

For all persons, cycling can work wonders. By co-ordinating cycling with proper nutrition and factual exercise information, this activity can greatly improve the health condition of all classes and age brackets of people.

The Ontario Bikeway Coalition, as a result of the information gathered from their Bikeway Study on this matter, has come up with an approach to help solve the high costs which accompany Health Care Services. Their proposed method is one aimed to "prevent sickness" by encouraging and promoting pleasurable activities, and pleasant, improved facilities that are built around an enhanced environment.

### General Points to Consider

There are basically two types of bicycle trails:

1. Utilitarian - a trail that is built for a functional reason, such as getting to work or going shopping.
2. Recreational - a trail that is built purely for recreation. These trails usually connect parks or points of interest, and very often provide for studying the natural environment.

In an urban setting, any bicycle trail that is built could serve both these purposes.

Bicycle paths should provide cyclists with a safe, smooth, comfortable ride; that is, it must have a hard, smooth, wear and skid resistant surface. It seems that asphaltic concrete on a compacted gravel base is the most appropriate. It has a shorter useful life span than concrete, but is relatively less expensive, easier to lay and repair,

and is not so subject to cracking and ridging if the base shifts, while still providing the required surface qualities. On the other hand, compacted aggregate surfaces have a very short life, need constant repair and attention, and form a low traction, rough-riding surface.

The cost of bicycle signs, based on sixteen signs per mile, is about \$300.00.

Flat terrain lends itself to the use of bicycles and will encourage the use of constructed bicycle paths.

If bicycle paths are to be constructed, it must be taken into consideration that racks will be needed so that people can park their bicycles and lock them up.

#### State of Oregon Highway Fund

#### 366.514 Use of highway fund for footpaths and bicycle trails.

1. Out of the funds received by the commission or by any county or city from the State Highway Fund reasonable amounts shall be expended as necessary for the establishment of footpaths and bicycle trails. Footpaths and bicycle trails shall be established wherever a highway, road or street is being constructed, reconstructed or relocated. Funds received from the State Highway Fund may also be expended to maintain such footpaths and trails and to establish footpaths and trails along other highways, roads and streets and in parks and recreation areas.

2. Footpaths and trails are not required to be established under subsection (1) of this section:

(a) Where the establishment of such paths and trails would be contrary to public safety;

(b) If the cost of establishing such paths and trails would be excessively disproportionate to the need or probable use; or

(c) Where sparsity of population, other available ways or other factors indicate an absence of any need for such paths

and trails.

3. The amount expended by the commission or by a city or county as required or permitted by this section shall never in any one fiscal year be less than one per cent of the total amount of the funds received from the highway fund. However:

(a) This section does not apply to a city in any year in which the one per cent equals \$250 or less, or to a county in any year in which the one per cent equals \$1,500 or less.

(b) A city or county in lieu of expending the funds each year may credit the funds to a financial reserve or special fund in accordance with ORS 280.100, to be held for not more than 10 years, and to be expended for the purposes required or permitted by this section.

4. For the purposes of this chapter, the establishment of paths and trails and the expenditure of funds as authorized by this section are for highway, road and street purposes. The commission shall, when requested, provide technical assistance and advice to cities and counties in carrying out the purpose of this section. The division shall recommend construction standards for footpaths and bicycle trails. The division shall, in the manner prescribed for marking highways under ORS 483.040, provide a uniform system of signing footpaths and bicycle trails which shall apply to paths and trails under the jurisdiction of the commission and cities and counties. The commission and cities and counties may restrict the use of footpaths and bicycle trails under their respective jurisdictions to pedestrians and non-motorized vehicles.

5. As used in this section, "bicycle trail" means a publicly owned and maintained lane or way designated and signed for use as a bicycle route.

Oregon Bikeways

Planning Methods

In planning a bikeway, you must:

1. identify user needs
2. classify various needs into user priorities
3. devise methods to accomodate such needs, according to priority

Thence, the information can be quantified and translated from user priorities into territorial priorities, approximate locations, projected goals, and mapping. From mapping and compiled statistical material, construction priorities could be established.

Priorities

1. Establishment of commuter routes in urban areas that will jointly serve school children and cyclists commuting to work, shopping areas, or recreational facilities.
2. Establishment of short recreational bikeways near population centres. The average length of these would be fifteen miles. Bikeways should be planned and developed with pleasure in mind; connecting points of interest, scenic vistas and recreational areas.
3. Establishment of long distance bicycle routes, usually for purpose of touring. Such routes are highly desirable but will be most costly. These trips generally do not mix well with other types of riding because of the speed and the rider's purpose of getting as far as he can in one day.

The ultimate goal is that routes serving the first two priorities may also serve the third wherever planned commuter routes coincide with the overall State plan.

Overall Project Goals

1. Elimination of existing conflicts between automobiles and bicycles.
2. Systematic interpretation of specific accident records in assigning

priorities for work projects.

3. Systematic and continual evaluation of rules of the road with respect to bikeway design and route planning.
4. Increased participation of other agencies in safety education, in accumulation of knowledge on lighting, law enforcement, auxiliary uses, aesthetics, and possible responsibilities in connection with the fixation of ownership registration fees.
5. Systematic and continual re-evaluation of design standards.

Economic Justification

Economic studies were done by the Highway Planning Section to justify per mile expenditures of bicycle route construction. The cost of bicycling, the time required for trips, and the value of time must all be considered.

For trips of five miles or less, the bicycle has a comparative advantage over the automobile, from the standpoint of operating and time costs. Other less tangible benefits could be obtained from reducing automobile traffic. This is so because drivers gain from reduced traffic congestion and reduced part-walk time. School-oriented bicycle routes are the most difficult to justify economically. However, safety advantages gained by providing adequate facilities would far outweigh the actual economic factors.

Financial Aid for Planning

The Highway Commission has approved a concept of offering financial aid to all Councils of Government (COG) to assist in planning within their jurisdictional areas.

COG prepares and submits to State a comprehensive plan of bicycle routes for the area under their jurisdiction within one year of the agreement date. Plans are to include route proposals, priorities, anticipated usage, and suggested methods of construction, as well as existing facilities constructed.

Financial offer based upon a percentage of the total combined funds is available to all governmental agencies within the COG areas for footpaths and bicycle trails, as required by House Bill 1700.

Questionnaire

To provide sufficient information on demand and purpose (sufficient to warrant construction), three types of information are required:

1. Preferences and attitudes of bicycle users
2. Ownership population and estimated proportion that will constitute actual users
3. Kinds of trips made, and location preferences of bike routes

Bikeways may be designed specifically for the following groups:

1. Cyclist organizations and citizen groups engaged in bicycle route planning.
2. The general public, to obtain representative sampling of ideas in urban and rural areas.
3. Grade and high schools.
4. County and city officials to determine their plans, priorities, and needs for bikeways in their communities.

Conclusions from the bicycle users questionnaire were that recreational and transportation facilities are the most important; routes along major arterials and in parks are desired; and bikeways separated from highways are the most desirable type.

Design Particulars

Grades:

For riders on 10-speed bicycles: 7.5% grade for distance not to exceed 300 ft. 10.0% grade for distance less than 100 ft.

Considering facilities for all riders, maximum grades of 5% should be used for bikeway designs. Grades of 7.5% for special conditions or short sections would be acceptable.

Classification of Bikeways

Bikeways may be classified in the following three categories, on the basis of basic design and relationship to the accompanying modes of travel:

**Class One - Exclusive Bikeway** - A facility completely separated from traffic, either located in a park or parallel to a highway designated for exclusive bicycle usage. These can be used either for one-way or two-way bicycle traffic, with minor pedestrian usage. Potential locations for Class One two-way exclusive bikeways are public parks, open spaces, abandoned railroad rights of way, channels and river banks, alongside new highways, and in newly planned communities

**Class Two - Restricted Bikeway** - This type of bikeway is adjacent to the right of way of motorized traffic or pedestrian traffic or both, but providing a physically separated through lane for bicycles only. Through traffic by motor vehicles or pedestrians is not allowed. Parallel conflicts between bicycles and motor vehicles can be buffered by a physical separation and by parked cars. This can provide a right of way for each mode of transportation. To be effective and adaptable for bikeways, a fifty-five foot roadway section would be required. This would provide adequate parking, two travel lanes, and one-way bikeway on each side between the parking and the curb. The Class Two bikeway could be constructed with new highways or during the conversion of two-way streets to one-way couplets; where surplus street width is created.

**Class Three - Shared Bikeway** - This type is delineated by signing, striping, or other visual marking devices. This may be shared with motorized traffic or separated by striping. This type of bikeway can be constructed on an extended shoulder or can be shared with pedestrian traffic on a widened sidewalk. Shared bikeways set out

rights of way for the bicyclist with respect to the shared traffic. On some city streets, they are marked by signing only. Shared bikeways have an economic advantage over exclusive and restricted bikeways.

Lighting

Regulations specify a rear-mounted reflector visible from 300 ft. and a headlight visible from 500 ft. This lighting equipment will enable the rider to be seen from the front and the back, but will not aid visibility from the side, nor is it of any appreciable aid to forward visibility of the cyclist riding in total darkness at speeds in excess of three miles per hour.

Signing

Standard delineation sign "BIKE ROUTE" and the motorist caution sign are the signs most frequently used. The standard delineation sign is accompanied by the appropriate silhouette bike symbol, and the caution sign has the same symbol which is marked "BIKE XING". New signs may be developed which will include a system of direction, warning, and information intended primarily for bicyclists.

In the development of new signs, the fact that the majority of bikeways will be laid out parallel to automobile traffic lanes must be considered. Therefore, many of the signs intended for bicyclists will be visible to motorists. Because of this, there must be no confusion between the two systems of signs. It is the present intention, therefore, that the study of each new standardized sign shall be exhaustive.

Parks and Rest Areas

Existing parks are the setting for many bikeways. However, parks may also be the principal destination of the bikeway, or they may serve as

rest areas along the route. Rest areas along bikeways will serve slightly different purposes than the rest areas used in freeway operation, simply because they will aid the traveller through periods of fatigue of a different kind.

Rest areas vary in plan: some may be turn-outs on steep grades; others may be equipped with more elaborate facilities. Locking devices on rest area bike racks are not deemed overly important because it is expected that few riders will stray far from their bikes.

Curb Cuts

Transition sections vary from the roll-type mountable curbs to ramps resembling those used for driveways.

Ramps with an easy slope four feet in length encourage bicyclists to enter the street and cross the intersection at high speed. A short slope of one foot is recommended so that the bicyclist will be encouraged to slow down when crossing the intersection. Localized gutter drainage requirements will also require attention. Care is being taken in the design process to assure that ramps can also be used by wheelchair occupants.

The Grate Problem

Parallel placement of bars in the grates of catchbasins facilitates the fall of water into the catchbasin, but allows a bicycle wheel to fall through the spaces between the bars. Welding small, flat crossbars on the pavement inlet grates of all catchbasins on State Highways known to be used by bicyclists.

Standard widths and construction of Oregon bikeways have been found to be similar in most respects to those found elsewhere.

Construction

The final costs of constructing 18.4 miles in 1971-72 was \$16,500/mile or a total of \$304,160.

In most cases, the bicycle routes are one-way facilities which involved widening the



paved shoulder on each side of the highway (Class Three). This has not been too successful because the motorist is inclined to use the widened shoulder for passing left-turning vehicles.

This is the most practical type of route from the standpoint of cost and, if located properly, could be safe. High-volume two-lane highways without left turn refuges should, for the above reason, be avoided. Other undesirable aspects of this type of bikeway are the problems of gravel, glass, etc. collecting.

Four methods of approach to bikeway construction have been developed. They are:

1. Maintenance - work done under the jurisdiction of District Engineers.
2. Parks Development - These are foot-path/bikeways.
3. Highway Project - Preliminary highway design work now includes an appraisal of the feasibility of constructing pedestrian/bikeways as part of any new highway project. Subsequent construction would follow, if found to be feasible.
4. Specific Bikeway Construction - These projects are separated from any other type of construction or activity.

In the first three methods, the bikeway may be placed completely or partially on existing dedicated rights of way, with resultant width limitations in some cases. In the fourth method, right of way is obtained outright as part of the project.

#### Use Evaluation

There is a preliminary cost per bicycle-user mile. Assuming a ten year life for a \$16,000 per mile bikeway, and based on a 240-day year usage, the average cost per bicycle-user mile is \$.30. On a full year usage the cost per user-mile would be \$.20. These costs can be compared to \$.02 per mile which is the cost for the automobile user on the road.

On all types of bikeways constructed, extreme care must be exercised to provide safe, economical, efficient and enjoyable facilities for the mobility of the cyclist, as well as his compatibility with motorists and pedestrians.

Bicycles do have their disadvantages. They are not efficient in snow, and offer no protection against rain. For the average person, they are no means of long-distance travel, and many elderly and very young persons are unable to use them. However, the bicycle also has many advantages, one of the most important of these being keeping the person physically fit. Such advantages are the reasons why the number of bicyclists has risen.

#### Bikeways and Safety

Usually, the bicyclist gradually assimilates the meaning of traffic signs and behavior on the road. The bicyclist has learned how to occupy the road space in the relative absence of automobiles and how to use the sidewalks in the absence of pedestrians.

Most of the serious injuries and fatalities connected with bicycle riding result from the collision of bicycles and automobiles. Youthful bicyclists, in particular, tend to stray from delineated bike paths. It could be made a legal requirement that bicyclists use established bikeways in preference to the lanes for motorized traffic. A reduction in potential liability situations and distress over bicycle encounters would provide, for the motorist, a definite benefit from the funds required for bikeway expenditure.

Heavy bicycle traffic must be segregated from heavy auto traffic in order to reduce situations of conflict. The bikeway provides varying degrees of segregation, ranging from routing bikes through less heavily travelled roads and streets (Class Three) to completely segregated facilities (Class One).

Organized public pressure on behalf of bikeway construction comes primarily from urban areas where needs are greater, but where responsibility for streets, sidewalks and other dedicated land use rests primarily with city or county governments.

## TRIM TRACKS

Prepared for the Department of  
Culture, Youth and Recreation

Province of Alberta, May, 1973

Compiled by Dale Schulha

Generally, the Canadian population is physically unfit. In past years, the average person has not been overly concerned with this fact but recently a "fitness conscience" has overtaken the Canadian public. The physical fitness standards of Canadian people and the North American population, as a whole, are significantly lower than those of European populations. This fact is evidenced by numerous studies conducted by exercise physiologists throughout the world. Many plausible reasons have been put forth to explain this significant discrepancy in fitness standards but one which stands out as a definite contributing factor is the availability of exercise facilities for the general public. European countries, especially Germany and the Netherlands, have been world leaders in the construction of public exercise and fitness facilities.

One facility which has had a tremendous impact on the European people is the trim track. This facility is synonymous with the fitness trail, exercise trail, trim-parcours, vita circuit, sweat track, and fun-fitness-trail. Basically, a trim track is a forest trail specifically designed for walking, jogging, or running, and the performance of certain exercises. The track is usually from one to three miles in length and incorporates as many as twenty exercise stations during its course. This type of fitness facility has become very popular for a number of reasons:

1. It is inexpensive to construct and maintain.
2. It is located outdoors.
3. It is open to all people at all times.
4. The individual performs at his or her level of competence with no interference from anyone.

The trim track has also gained impetus by the fact that it can be used year-round. During the winter months, the track can be used for cross-country skiing or snowshoeing with no damage resulting, and no redesigning of the trail being necessary.

It seems apparent that the trim track is a facility which could meet many of the physical fitness needs of the Canadian public. Trim tracks could be the flexible conditioning program so desperately needed by the people of Canada. However, fitness trails of this nature will only be constructed and maintained as long as the Canadian population shows a sufficient interest in them.

### General Information

Recreation training trails shall be laid out to fulfill as many different requirements as possible. Thorough-going plans must therefore be drawn up prior to commencing work.

Preferably, the trail should run through different types of terrain, not least because it will also be used for cross-country skiing. If possible, downhill and uphill stretches of the trail should be about equal in length.

Moreover, the amount of labor and materials needed should be given the consideration, as well as suitable work-out sites where calisthenic equipment can be provided.

If possible, all recreation trail users - ranging from casual promenaders to elite competitors - shall be able to use the trail simultaneously without interfering with each other. Trail width should be from 4 to 6 meters (4 yds 4 in. to 6 yds 6 in.). Along heavily forested

stretches, the trail must be made wider so that falling snow will be able to cover it sufficiently to ensure maximum winter-time usage.

Recreation trails should be of standard lengths: 1.25 km ( $\frac{4}{5}$  mile), 2.5 km ( $1\frac{1}{2}$  mile), 5.0 km ( $3\frac{1}{10}$  mile), and 10.0 km ( $6\frac{1}{5}$  mile). Trails of non-standard length are not recommended except in situations where natural conditions so dictate.

Electric lighting should be installed primarily along the 2.5 km ( $1\frac{1}{2}$  mile) trails. If the 1.25 km ( $\frac{4}{5}$  mile) trail is not incorporated into a 2.5 km ( $1\frac{1}{2}$  mile) trail, the 1.25 km ( $\frac{4}{5}$  mile) trail should also be lighted - particularly for use by children and teen-agers.

Trails should be laid out to avoid areas in which water accumulates. The first part of the trail should run along the level or through gently rolling terrain. Hereafter, advantage should be taken of the variety offered by the available terrain. All downhill stretches and turns on the trail shall be gentle enough that they can be negotiated by a relatively untrained skier.

Uphill stretches should not be so steep that the skier must resort to herring-bone or switch-back climbing. Grade crossings shall definitely be avoided, as well as roads and highways carrying traffic.

Sufficient parking space must be provided adjacent to the starting points of recreation trails. Access to premises where users can change clothes is another important requirement. These premises shall also provide showers and, preferably, a sauna.

Extras can be added as time goes by to enhance the enjoyment of all users. Examples might include a gentle hill set aside for small children using sleds and "flying saunders", a nature-study station, etc.

#### Grading and Base Course

The trail is designed so that maintenance work can be carried out using a tractor. It incorporates a base course that can be kept dry throughout most of the year. Care is taken to see that users are not exposed to needless risks. For example, that there are no loose rocks or sharp stumps along the trail.

#### Rough Grading

The trail area will be cleared from trees through a width of 10 - 20 feet. In heavily forested stretches, the forest adjacent to the trail will be thinned to improve the snow cover. The rough graded trail will be 10 - 20 feet wide, so that it can accommodate a tractor throughout its entire length. The finished trail will be about 9 feet wide.

#### Drainage

Brooks and streams will be bridged wherever they are crossed. The bridges will be about 10 feet wide and are designed to support a tractor if necessary. Culverts will be provided for ditches and other depressions that would be dammed by the trail. Sheet metal or concrete culverts will be used. To be able to accommodate heavy spring runoffs, the culverts are made double the size of normal dimensions.

As drainage improves, maintenance requirements diminish.

### Base Course

On relatively level, dry and porous ground resting on a solid sub-base, the rough graded surface can usually be used as a base for the surface coating. On the other hand, filling with a porous material (gravel or the like) will be provided to a thickness of at least 8 inches on moist ground where the load-carrying capacity is relatively good.

The gravel base course has two purposes: to provide a foundation for service equipment and to provide a drainage base.

On very moist ground where the load-carrying capacity is poor, a corduroy base can be laid. We take logs cut to the width of the trail and space them 1 ft. apart perpendicularly across the trail. Then we put down a layer of spruce branches (about 18 in. thick). Ditches at least 18 in. deep will be dug 3 ft. from the ends of the logs. The material taken from the ditches we then put on the spruce-branch base. The filling above the spruce branches will be about 18 in. thick.

### Surface Coating

The Physical Fitness Trail will be surfaced with a soft material. A mixture of sawdust, sand and pinebark can be used. However, a freshly laid surface is loose and difficult to run on in the beginning, but as time passes, it acquires the desired firmness and surface resilience.

The thickness of the surface coating will be 4 - 8 inches, and the width will be about 3 ft. This arrangement permits tractors to be used to maintain the trail without running them on the surface coating.

Just as all other trail work, clearing and rough grading will be carried out in such a way as to provide surroundings that are as attractive and pleasant as possible. Damaged surfaces and gravel courses extending beyond the surface coating, we cover with topsoil and plant with greenery to improve the appearance of the trail.

XIX. CONSTRUCTION OF CROSS COUNTRY SKI COURSES

The ideal trail is laid out in rolling wooded terrain with a number of climbs and descents to give variety. The size of the area available will determine the shape and length of the course. If you are cutting or preparing it for racing purposes, careful attention must be given beforehand to ensure that enough elevation gain is included throughout the course.

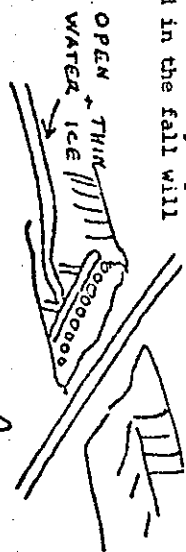
Trail Planning.

1. Permission to use land for this recreational sport may readily be given in preference to over-snow vehicles or trail bikes operators, due to the skis' low environmental impact. However, careless skiers can still cause considerable damage if they are thoughtless. When you have found an area which is suitable to your needs, enquire around and see whether other groups such as school boards, horse riders and natural history groups would like to join you in developing the trail for multipurpose, seasonally differentiated activities. A larger co-operative group using the trail will appeal to private land owners and Provincial or Federal Governments more readily. Once you are organized with a small committee, set your aims and objectives and write them down so all is clearly understood. Be prepared to argue your case and try to anticipate problem points and have an answer ready. Procedure from there is varied due to each unique situation and cannot be elaborated here.

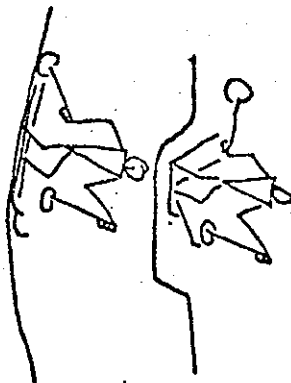
2. Once permission is obtained a good comprehension of the lie of the land is required. Air photographs viewed stereoscopically give the best idea and if these are not available or deemed unnecessary, the area must be hiked with map and compass. Regardless the area should be well known so that topographical features which are too small to be shown with contour lines, e.g. steep sided streams and bluffs, can be filled in on the map. Hiking will also bring to light such situations as large areas of dead fall which might not show on aerial photographs and will require many man-hours to cut through and with planning can be avoided. The best time of year in which to hike is the fall when deciduous trees have shed their leaves, the ground is dry, and the land contours are more easily seen.

3. The following points should be well noted since they will have an appreciable effect on planning and cutting the trail, having a lengthy ski season and ski-ing safely.

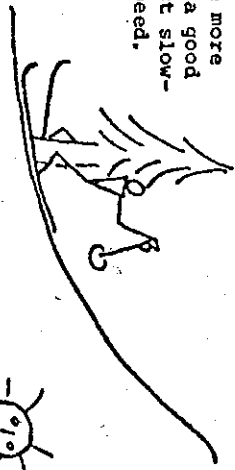
Streams: If these run all winter and the track crosses the ice some flooding may occur. A bridge erected in the fall will remedy the situation.



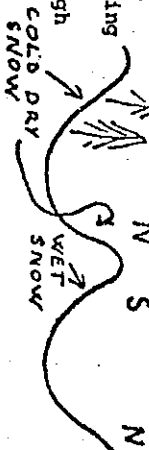
Sharp dips, abrupt angle changes: These have to be cut down or contoured so a ski will not be required to flex too far and break. Avoid excessive earth removal as this takes backbreaking work.



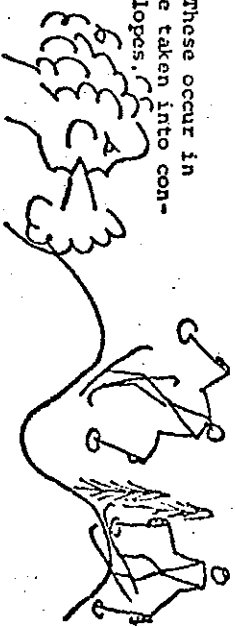
Steep slopes: These are easy to walk down at 4mph but at speed they are more difficult. Note whether there is a good run out or elevation rise to assist slowing down. Avoid sharp bends at speed.



South facing slopes: These will catch the sun in winter and be comparatively warm compared with shadowed or North facing slopes. However, in Spring they are far warmer and snow may well melt early. Try and run trails through trees on South slopes.



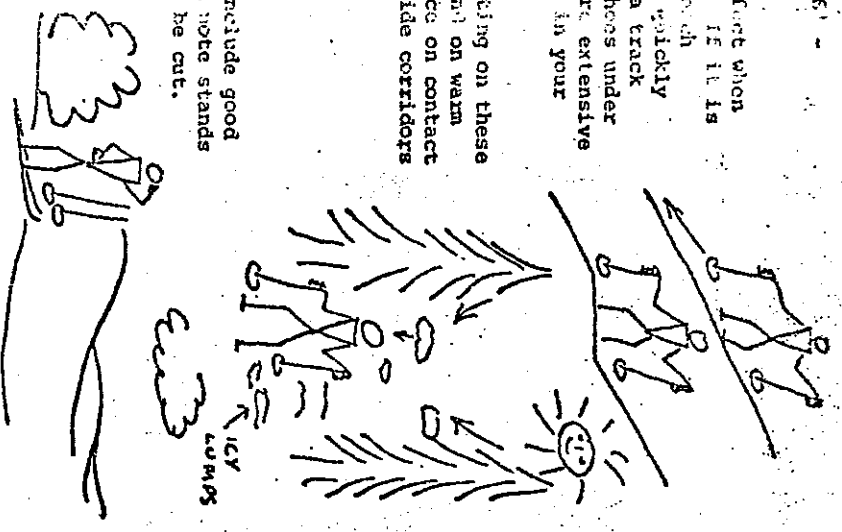
Prevailing wind: These occur in some areas and should be taken into consideration on exposed slopes.



Hill angle: This has an effect when one is traversing across a hill. If it is steep skis tend to slip down on each successive pass, so the trail is quickly broken. It is difficult to set a track with oversnow vehicles or snow shoes under these conditions. It will require extensive cutting to remedy or be included in your course.

Coniferous trees: Snow resting on these wide branches slumps to the ground on warm days and freezes into lumps of ice on contact with the ground. Try and find wide corridors for trails through these trees.

Views and flora: Try and include good distance views in your trail and note stands of mature trees which should not be cut.



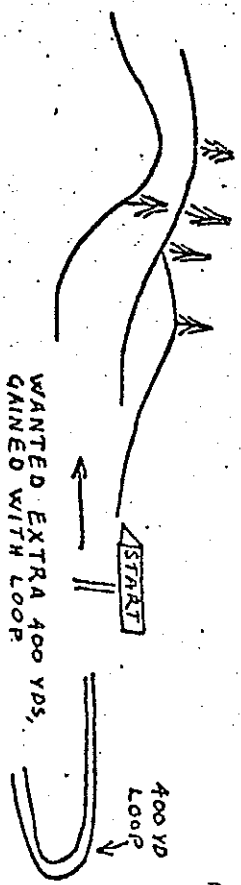
4. On a racing trail check points have to be placed at the extreme sections of the course. They should have a good position where the checker can shelter and record the race number. They can also double for feeding stations on long races. Inclusion of a woodpile for a small fire would do much to ease the official's discomfort. Access should be easy if possible.

5. Total elevation gain for race trails must be in the following range to meet international standards. This may be impossible to gain but every track need not meet international standards.

Course	Total elevation gain range
5 km women's	492 - 656 feet
10 km women's	820 - 1150 feet
10 km men's	984 - 1475 feet
15 km men's	1475 - 1965 feet
30 km men's	2480 - 3280 feet
50 km men's	3940 - 4920 feet

Trail Staking

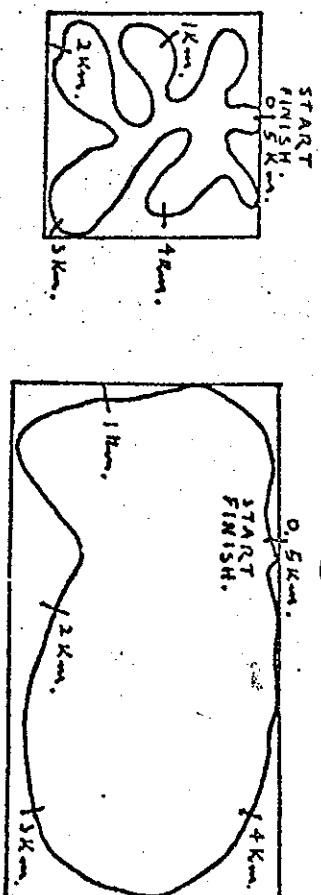
Bearing in mind the above points walk around the proposed course and try to have a ratio of 1:1.1 of flat, uphill and downhill. If you want the course to be a special distance check the scale of the photograph and measure the photograph distance onto a paper edge.



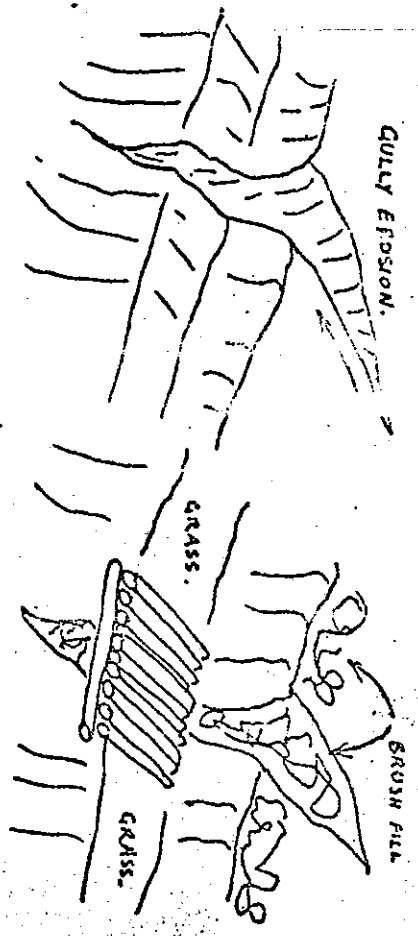
Start the measuring and actual physical marking of the distance from an area where it is easy to add or subtract a loop to adjust to the distance required. You are now prepared to stake or tag your trail.

SMALL AREA.

LARGE AREA.



- To obtain the most distance for your trails in a small area, loops going out and coming back to a central point are best laid out. Large areas do not have to consider this.
- Walk around the course and tag with surveyor's ribbon. Leave the course alone completely for a week and then return and walk again. Check it for all points mentioned above. If there are inaccuracies, carefully remove the surveyor's tape and remark.



3. Before making plans to cut the trail walk around with an environmentally knowledgeable person, probably from the Provincial Government, and see if you are likely to have any erosional or other problems associated with the trail.

Trail Cutting

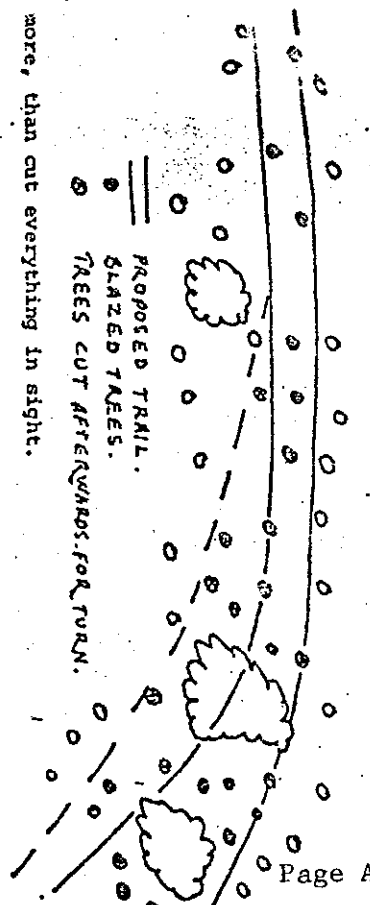
In one's eagerness to cut a trail excessive cutting or pruning can be carried out, so well led and organized groups must be provided.

1. A community well organized can cut a trail in a short period of time. Appoint leaders of 3 man groups to cut and clean a section of trail, distance is determined by the degree of difficulty and amount of work involved. These leaders are responsible for the safe use and maintenance of the tools. All tools should be sprayed with fluorescent orange or have surveyor's tape stuck to them to prevent loss in the undergrowth.

2. Meals should be eaten at the trail site since it might be difficult to round up volunteers from their homes after lunch. This should be an enjoyable occasion with food supplied by mothers and daughters. Group photographs and certainly the local Newspaper photographer will develop a group spirit or cohesiveness besides providing advertising at no cost.

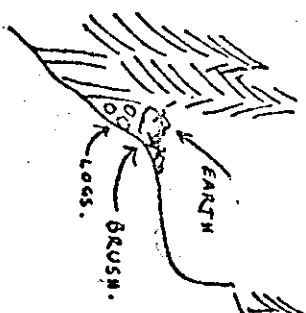
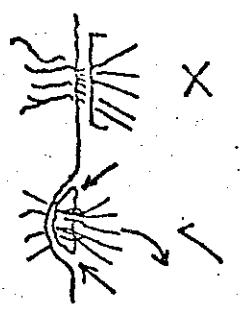
Brush Cutting Technique

1. The trail should be a minimum of 8 feet wide and wider at corners. All trees to be cut should be marked beforehand with a blaze. Be conservative in marking, it takes two minutes to cut but forty years to grow. Better to go around later and line up the trails by cutting



more, than cut everything in sight.

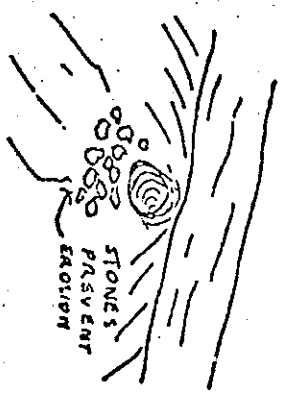
2. Brush should be cut out by the roots to prevent further growth. As it is cut it should be cleared to the downhill side of the trail and packed to provide a more even surface. Dirt thrown on top from the uphill side will root grass and stabilize any erosion. A slight slope of 5 or 10 degrees makes it difficult to



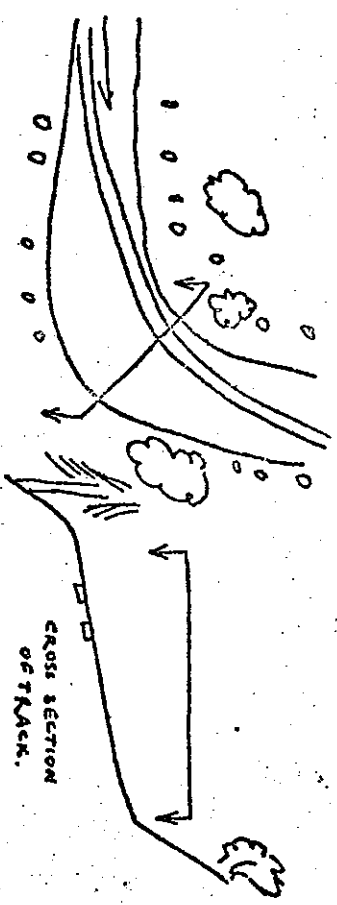
use oversnow vehicles since they slip laterally. Think carefully on this point.

3. As you go along ensure that all sharp projections are cut off and a falling skier will not impale himself on cut branches.

4. Sharp depressions should be filled or cut back to provide even contours. If they are channels for water run off try and find old



- 5. Sharp turns should be widened and banked slightly to assist



the skier turn.

If the growing season has not finished, plant fescue or clover in the earth cut track sections to prevent erosion and make it pleasant to hike and train on.

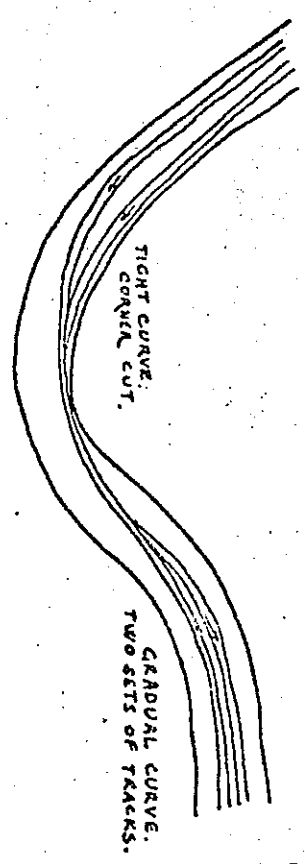


Winter Track Setting

For good skiing, whether touring or racing, a set of ski tracks increases immeasurably the pleasure to be had through this sport. The following points must be considered before setting the track.

- 1. Snow has the peculiarity of, when being disturbed, in combining together and forming a more solid mass after a period of 24 hours. This fact is utilized by setting tracks at least a day ahead of when they are to be used so the skis can run in firm tracks and the poles do not sink into the snow.

- 2. Where possible on a trail a pair of tracks should be set. This allows for the slower skier to step aside into the second set which gives him good directional skiing while the faster skier travels on without a break in stride. However, on hill corners skiers will invariably take the flattest turn.

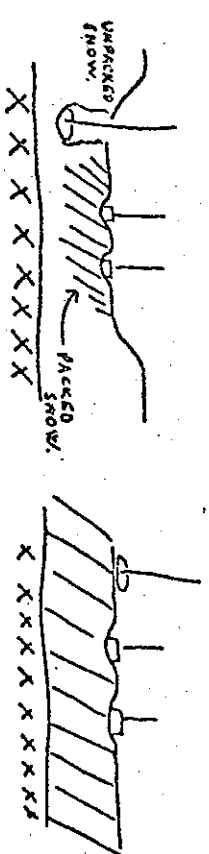


The tracks should be set so they come into the corner high on the outside and cut low to the inside. On slow, less tight turns parallel sets of tracks can still be used.

- 3. As the snow builds up during the winter twigs and branches which could not be reached in the fall could well be brushing the taller skiers faces. A check around the course with saw and pruners will eliminate these painful objects.

- 4. The ski trail is not packed again until the tracks are really well worn and no longer hold the skis. A heavy snowfall makes poling too hard and obliterates the track and this also requires track setting.

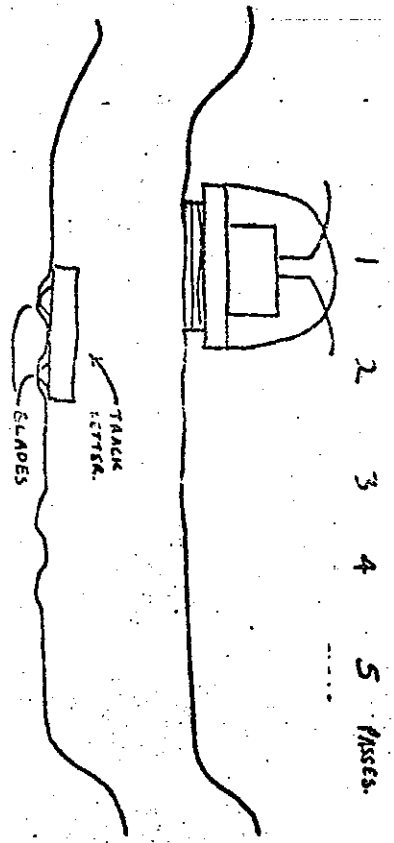
- 5. The snow either side of the ski track must be packed well so that the poles can be planted firmly without giving way.



Track Setting Methods

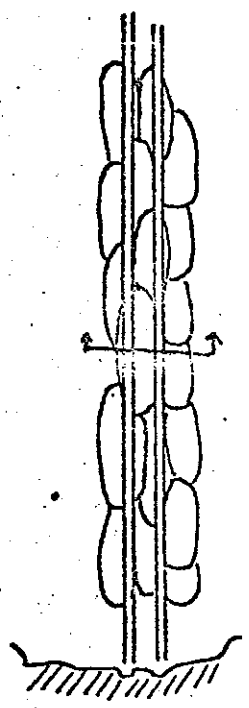
- A. Oversnow vehicle and tracksetter: The oversnow vehicle should have cleats fastened to its tread to prevent lateral sliding on sloping trails. It is run over the trails to pack the snow in





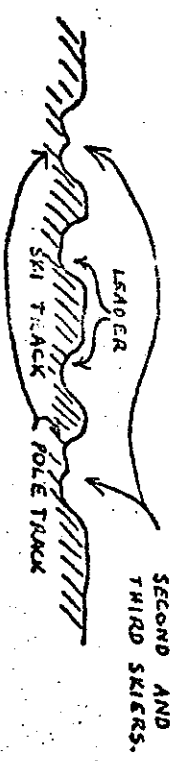
6-8 feet wide swaths. A track setter, very much like a heavy sledge, with a fixed hitch is dragged behind the oversnow vehicle. Protruding through the bottom of the track setter are two steel plates which cut tracks the width of each ski and six inches apart on the inside edges (see plan).

B. Snowshoes and skis: A group of skiers sets out on snowshoes to pack the trail on foot. Experienced heavy skiers come behind



and set the track by pressing hard on their skis to develop the groove.

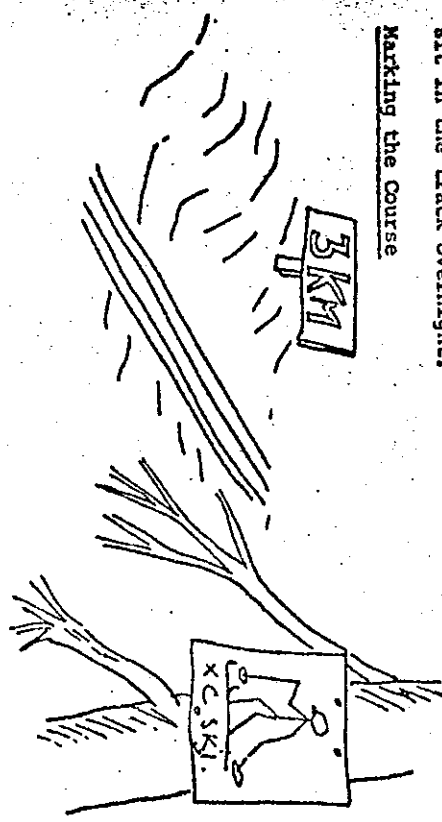
C. Ski: The trail is skied by a group of skiers. The leader takes the course which one would follow when racing, carefully keeping his



SPARE SKIERS ASSIST IN PACKING POLE TRACK + SKI TRACK.

skis as wide as the six inch width. The next two skiers maintain a position to left and right of the leader's tracks but keep their feet close together. Other skiers come behind and either break down the snowridges by the pole track or skis in the main track. Last skier travels behind and makes sure no large lumps of snow sit in the track overnight.

Marking the Course



For racing the kilometre distances should be marked cumulatively while the tourers might only need a cross country skier symbol in fluorescent paint fastened to trees signifying the trail. One hopes this will be respected by other recreational enthusiasts. Try and remain on good terms with these local clubs. If they are oversnow vehicle operators ask for assistance from them when delivering people to check points for races or timed tours. Snowshoes will be only too glad to pack your trail and maybe they could help with the mid-winter pruning. A carnival get together during or at the end of the year could create good relations.

Source of the following is unknown.

Table III Selected Trail Standards

Organization, Area, or Author	Facility Standard	Ref. #
California Public Outdoor Recreation Plan	<u>Short Trails:</u> 10' wide, 5% av., slope, 15% max., car parking for 25 cars min. and 100 max. <u>Long trails:</u> well-defined trails, 5% av. slope, 15% max., camp areas of 3.5 ac. at around 3 - 5 hours hiking time.	(450)
Carbon County, Pa.	<u>Hiking trails:</u> per 10 acres of available land develop one 3-mile and one 1½-mile trail.	(451)
Wisconsin Dept. of Resource Development	<u>Hiking or nature trails:</u> 20 persons per mile of trail.	(479)
Placer County Recreation Committee	<u>Hiking trails:</u> 4 persons per mile of trail.	(475)
Bureau of Land Management	<u>Riding and hiking trails:</u> average grade 8% or less with 500' of 4% or less every mile, rest stops every 3 - 5 miles, overnight camping areas with tables, fireplaces and pit toilets every 10 - 20 miles. Width of trails: hiking, single file with widened areas every 200 - 500 yds.; pack trails, 8' wide; interpretive trails, 4' wide for medium use, and 6 - 8' for heavy use,	(445)
Wisconsin Conservation	<u>Nature trail:</u> 1 - 2 miles long with an allowable use of 50 people per mile, turn-over rate of 8. <u>Hiking trail:</u> 40 hikers per mile.	(480)
Louisiana Parks and Rec-	<u>Hiking trail:</u> 20 miles can be developed on 24 acres of land plus 10 acres for supporting facilities. 10' wide, campsites of 5 acres each at 15 - 20 mile intervals, water at 6 mile intervals, allowable use 20 hikers per mile with turn-over rate of 5. <u>Historical trail:</u> 10' wide.	(466)

Selected Trail Standards (cont'd)

Organization, area or Author	Facility Standard	Ref. #
Louisiana Parks and Recreation Department (cont'd)	<u>Nature trail:</u> 10' wide, 2 miles long, 2.4 acres, 10 people per mile. <u>Horse trail:</u> same as hiking trail except allowable use is one horse per mile, turnover rate of 2.	
Beazley, 1971	<u>Interpretive trails:</u> ½ - 1 mile long, 3 - 5 ' wide, widening at pausing places, 10 - 12 exhibit stations per trail, grades to be no more than 15%.	(188)
Rutledge, 1971	<u>Nature trails:</u> 1 - 2 miles long, 50 people per mile/day. <u>Rural hiking trail:</u> 40 people per mile per day. <u>Urban hiking trail:</u> 90 people per mile per day.	(222)

APPENDIX D

EXAMPLES

1. The San Antonio River Walk ("B" type trail)
2. The Toronto Bicycle System ("F" and "G" type trails)
3. Trails for the handicapped ("A" type trails)

# River Walk Generates 'Strong Positive Response'

By Clare A. Gunn

This study analyzes the response to an outstanding design and development of a park-business complex along a natural river in the heart of a major city, The San Antonio River Walk. The research includes both those who visit and those who control or influence its development.

The River Walk refers to a horse-shoe bend in the San Antonio River covering an area about four by six blocks in size in the central business district. This portion of the river lies in a deep cut, about 25 feet below street level, and is flanked by huge trees, lush plant growth and many shops, restaurants, and hotels. A continuous promenade parallels the river on both sides and the 50-foot river is bridged many times, providing both automobile and pedestrian crossing.

The visitors' use and image of the River Walk was surveyed through visitor response to interview—using social survey techniques at nine stations along the River Walk. The survey was conducted on weekends for a full year.

Results of the survey reveal a single encompassing conclusion — the River Walk design and development are evoking an unusually strong positive response. This response is consistent over a wide range of ages, incomes, and occupations of visitors. Visitors describe the River Walk as very beautiful, moderately large, passive, uncrowded, safe, very interesting, cool, and uncommercial. At the same time, they make diverse leisure use of the area. Some find solitude and others find excitement and gregariousness. Some shop and others do not. Some prefer to walk and others like the specially designed sightseeing barges. A wide range of personal satisfactions appear to be coming from a relatively small development.

In order to gain some insight into the strength of the voter support of the San Antonio River Walk, the reg-

istered voters of the city were surveyed. A statistical random sample of 2,001 of the 216,100 registered voters was drawn and was mailed questionnaires. A total of 414 usable responses was returned, which constitute the basis for the following analysis:

- 76.6% have visited River Walk in the last year.

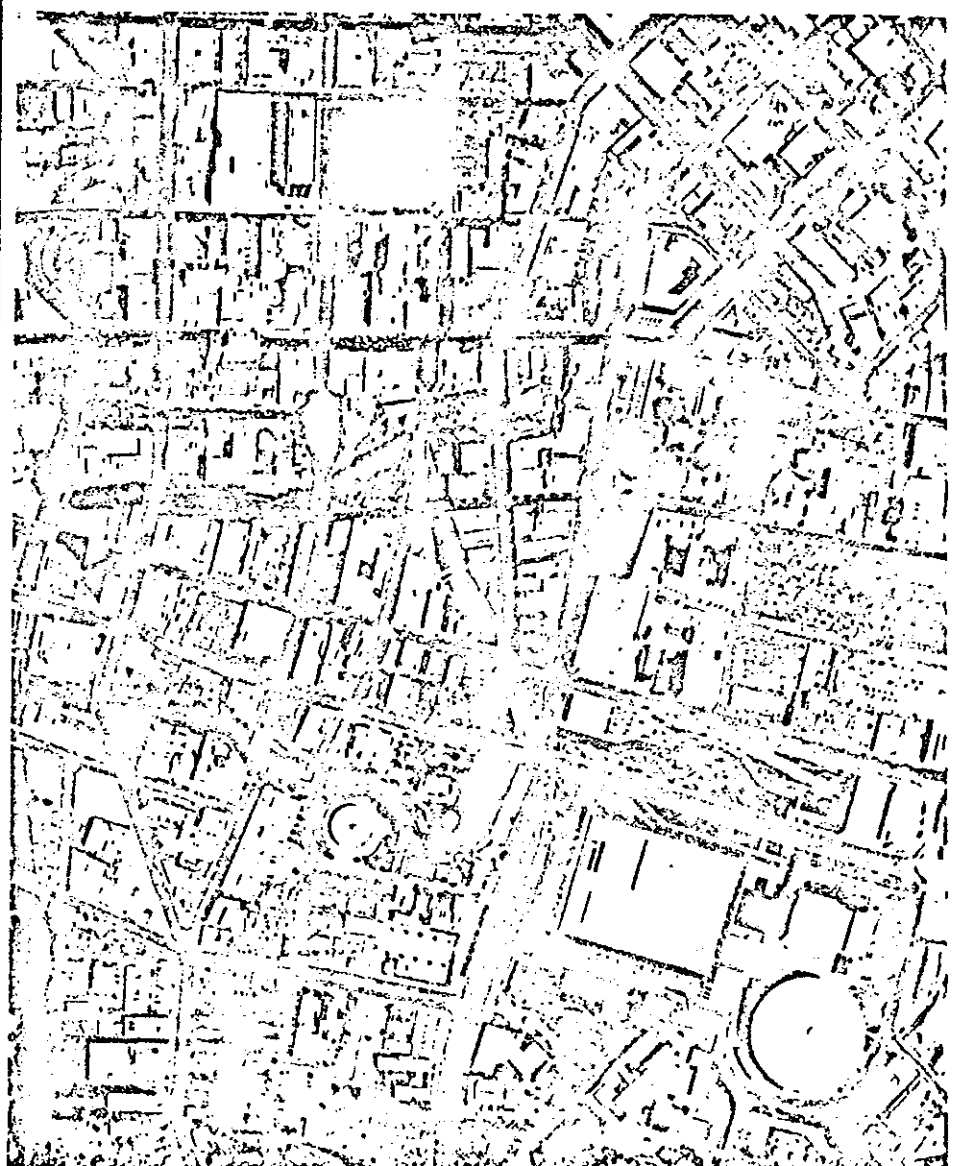
- 96.6% consider it a tourist attraction; 80.7% consider it to be of economic benefit to the city; 74.9% consider it to be of benefit to them as residents of the city.

- 42.5% consider downtown traffic a problem; 64.5% consider downtown parking to be a problem; only

- 15.7% believe that the entrances to the River Walk are difficult to find; 11.6% say that they could not get a ride to the River Walk if they wished to go there.

- 76.6% consider the building of the River Walk to be attractive; 50.2% consider the River Walk to be lighted well enough at night; 47.1% consider the River Walk to be safe; 48.3% do not consider the river water to be clean.

- 62.3% would favor increase recreational use of River Walk; 55.1% favor a man-made channel connecting with the Alamo; 79.7% favor improving the remainder of the San Antonio River northward to the Brackenridge Park while 62.8% favor improving south-



The horseshoe-shaped River Walk is at mid-left in airview, San Antonio, Tex.

At right: boat landing and sightseeing barge at Paseo del Rio Plaza.

ward to the city limits.

45.4% would be interested in living in an apartment along the river if available in their price range.

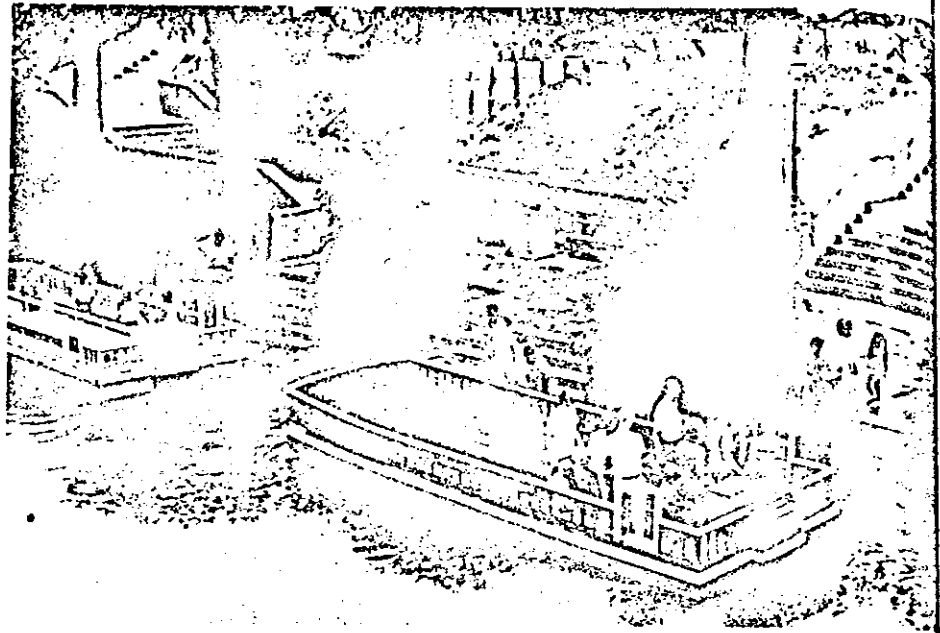
56.0% would vote for a bond issue to expand river development even if it raised taxes slightly; 25.6% favor if it would not raise taxes; 4.8% against if it raised taxes; 2.7% against even if it did not raise taxes (10.9% were undecided).

The survey of controlling agencies revealed a unanimity of policy toward the River Walk even though they are not bound officially. A high degree of collaboration and cooperation is taking place. When questioned, not one was interested in greater power, believing that the present management was working well.

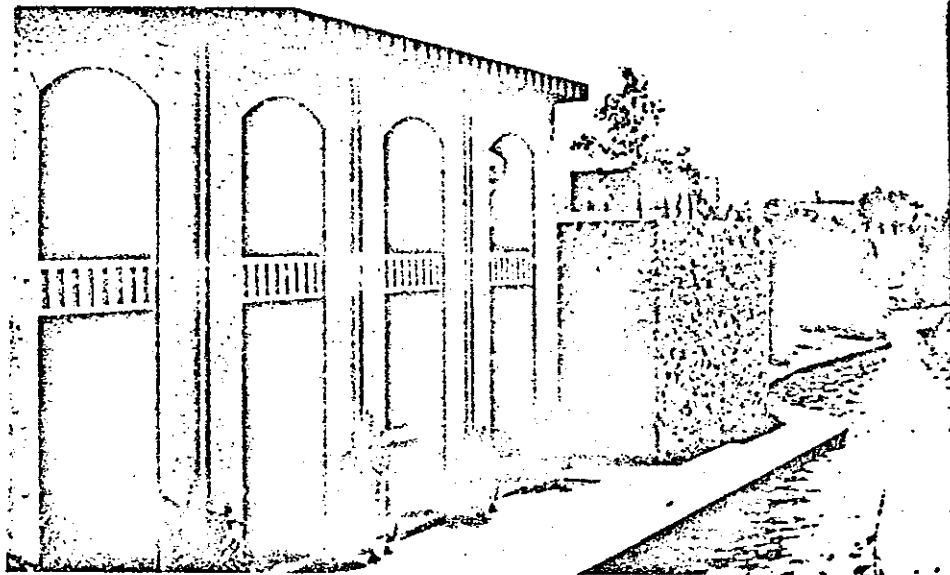
The contiguous owners of property did not reveal future plans but generally were in favor of the present River Walk development. Some were in favor of land use and building controls and others believed them to be overly restrictive. About 70% of the owners do not have land uses that face upon or utilize the amenities of the river at the present time.

#### Conclusions:

1. The River Walk is unique.
  2. The River Walk is a unified whole.
  3. The River Walk contains diversity.
  4. A delicate balance between park and commercial exists.
  5. The River Walk is of great social and economic value.
  6. The River Walk is a cohesive whole with dynamic internal forces.
- For other urban river areas:
7. The River Walk has an atypical setting.
  8. A refocus upon downtown can be accomplished.
  9. A small amount of water can become a powerful social force.
  10. Composite management can succeed.
  11. A business-park mix can be functional.
  12. Diversity is successful.
  13. Internal and adjacent land uses must be compatible.
  14. Both tourists and local citizens can participate.
  15. Can provide state tourism stimulus.

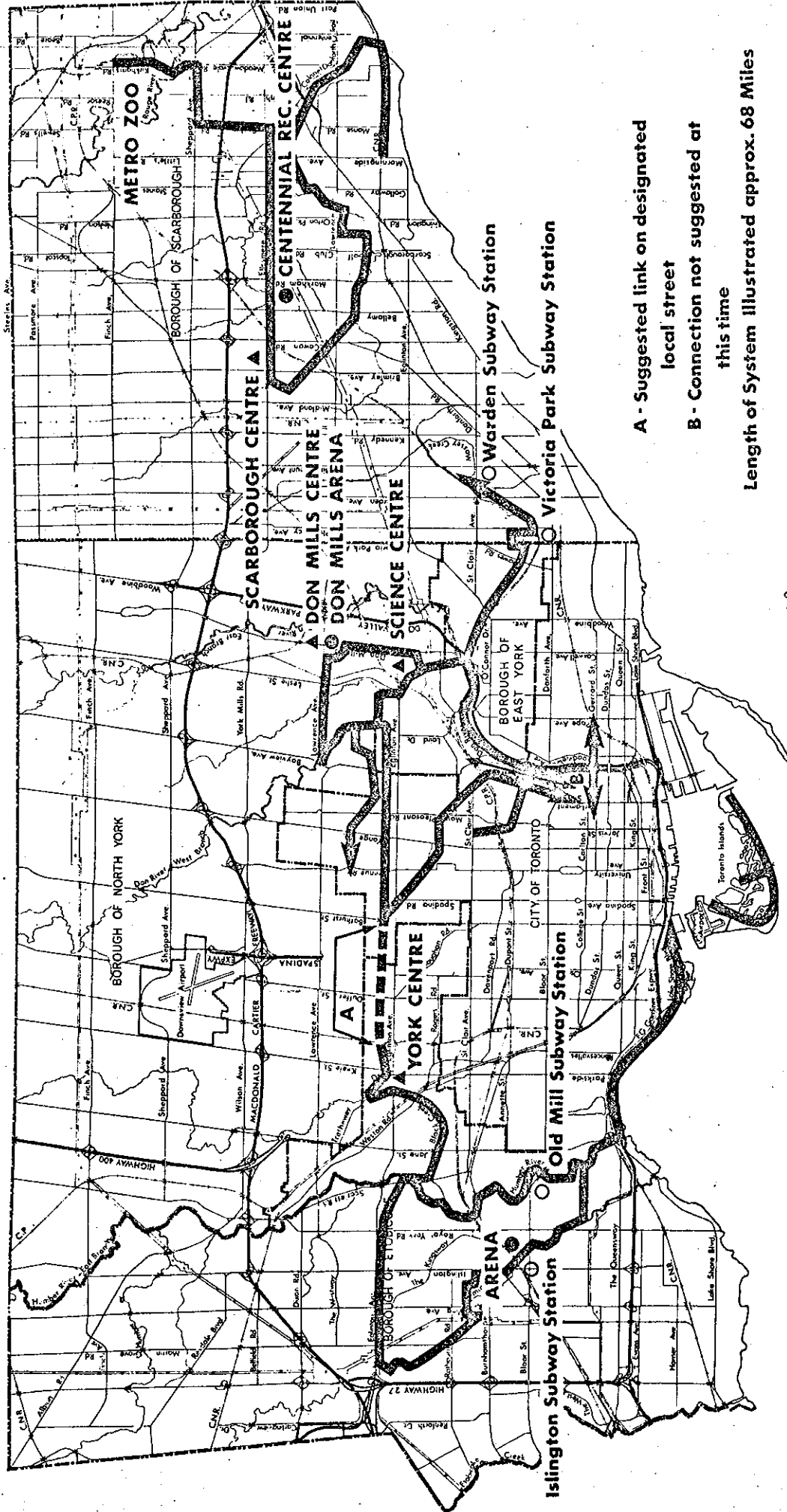


Below: the Chamber of Commerce Building, Hemisfair river extension. Design theme of the River Walk reflects heritage culture dating from the century of Spanish rule and era when Texas was an integral part of Mexico.



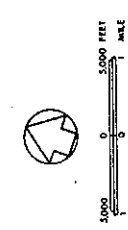
Contrast of landscape character along River Walk extension. Temperate climate, microclimate zone below street level allow semi-tropical plantings.





- A - Suggested link on designated local street
- B - Connection not suggested at this time

Length of System illustrated approx. 68 Miles



# Initial Trial Cycle Route System

For information about proposed bikeways in North York contact:

MR. S. COLE - COMMISSIONER OF TRAFFIC - BOROUGH OF NORTH YORK -  
5000 YONGE STREET - 225-4611

# There's a wheelchair in the woods

*from the journal, Parks and Recreation*

ALBERTA COMMITTEE OF ACTION GROUPS  
FOR THE DISABLED  
#4 10015 - 82 AVENUE  
EDMONTON, ALBERTA  
T6E 1Z2

by Edward H. Stone

"THERE'S A WHEELCHAIR in the woods!" your daughter breathlessly exclaims as you and other camping families attempt to start breakfast fires and greet the sun. "Is anyone hurt?" you ask. "Oh no," she says, "he's on the trail for the handicapped; they have fishing holes and sniffing boxes, and signs in braille, and everything!" Thus, your daughter's morning observations begin your exposure to the United States Forest Service's growing number of outdoor recreation facilities especially designed for use by the handicapped.

The Forest Service is constantly improving and expanding recreation facilities for the convenience and enjoyment of a rapidly increasing number of visitors and is helping them better understand and appreciate the forest environment. Besides those visitors who are in good health, there are others who are also entitled to the refreshing and challenging experience of a few hours or a day or more in the forest but whom circumstances deprive of easy access to these pleasures.

The aged and the physically, emotionally, and mentally handicapped must be considered. Their need for outings may be even greater than that of other recreationists. Often a few modifications in an outdoor recreation area, and better planning of new ones, can provide handicapped persons of any age with a joyful and memorable experience instead of one that is frustrating or hazardous.

Realizing this, the Forest Service has, for the past several years, been building short, self-guiding trails and other recreation facilities adapted to visitors who are blind or otherwise handicapped. One of the first was the Roaring Fork Trail which was built in the summer of 1967 on the White River National Forest in the heart of the Rocky Mountains near the ski resort of Aspen, Colorado.

Like other forest service trails for the handicapped, this was a cooperative effort. The idea came from Robert B. Lewis, an Aspen high school biology teacher. He interested the Forest Service in the project and Rangers helped him find an appropriate area and plan the trail. Young men from a nearby Job Corps camp cleared the trail route of obstacles and erected the signs which are in Braille and in English with large letters that can be read by persons with partial sight. Translation of the nature messages into braille was done by teachers and students of the Colorado School for the Deaf and Blind in Colorado Springs. The raised symbols were worked into weather-resistant fiberglass. The

Colorado Highway Department built a turnoff to the trail from State Route 82 and a small parking lot.

The trail begins at a wooden footbridge, then winds for nearly a quarter of a mile through a dense spruce and fir forest, over a glacial moraine (a deposit of earth and stones left by a glacier during the last Ice Age), down to the edge of the shallow mountain stream, and across a small alpine meadow or bog. Strong nylon cord guides the sightless walkers from one station to the next. The trail provides a variety of walking surfaces, from soft beds of evergreen needles over nearly bare ground with small stones, to the springy bog. The markers point out that much can be learned by touching, smelling, and listening, whether one has eyesight or not.

Since the completion of Roaring Fork Trail several other trails and special picnic, camping, fishing, and swimming facilities for handicapped persons have been developed by the Forest Service in National Forests in the East, West, and South. Most of these facilities can accommodate persons in wheelchairs who make up a large proportion of the handicapped population. Most of the trails have been constructed with the cooperation of local men's and women's service clubs.

In order to assure their availability during the height of the season, two recreation areas are open only to the handicapped and their families. One is the Mammoth Lakes Campground on the Inyo National Forest in the Sierra Mountains of east-central California. Another is the Trout Pond Recreation Area on the Apalachicola National Forest in western Florida.

These special areas have the following features to accommodate persons in wheelchairs:

1. Gently sloping, wide, paved trails and paths and paved walkways to restrooms;
2. Picnic tables with spaces for wheelchairs;
3. Low water fountains;
4. Fishing piers protected with guard rails; and
5. Restrooms without entrance steps, or with ramps and handrails; enough space inside to maneuver wheelchairs; cubicles with wide doors; handrails and benches; and special clothes-changing facilities.

The special Inyo National Forest campground was completed in July 1970 and has spaces for 17 families and four large groups. Close by is "Adventure Walk," a 900 foot self-guiding paved nature trail with 11 stops. Each stop has a push-button tape recorder, an especially



popular device with the blind who do not read braille. The taped messages interpret the plant and animal life, land features, and the natural and human history of the Mammoth Lakes area.

### A Community Project

The Lions Club and other citizens of Mammoth Lake made this a community project by accepting donations of materials, labor, equipment, and money from civic organizations, industry, and individuals. The Forest Service planned the area and designed the facilities.<sup>1</sup>

Built at the suggestion of the Tallahassee Handi-

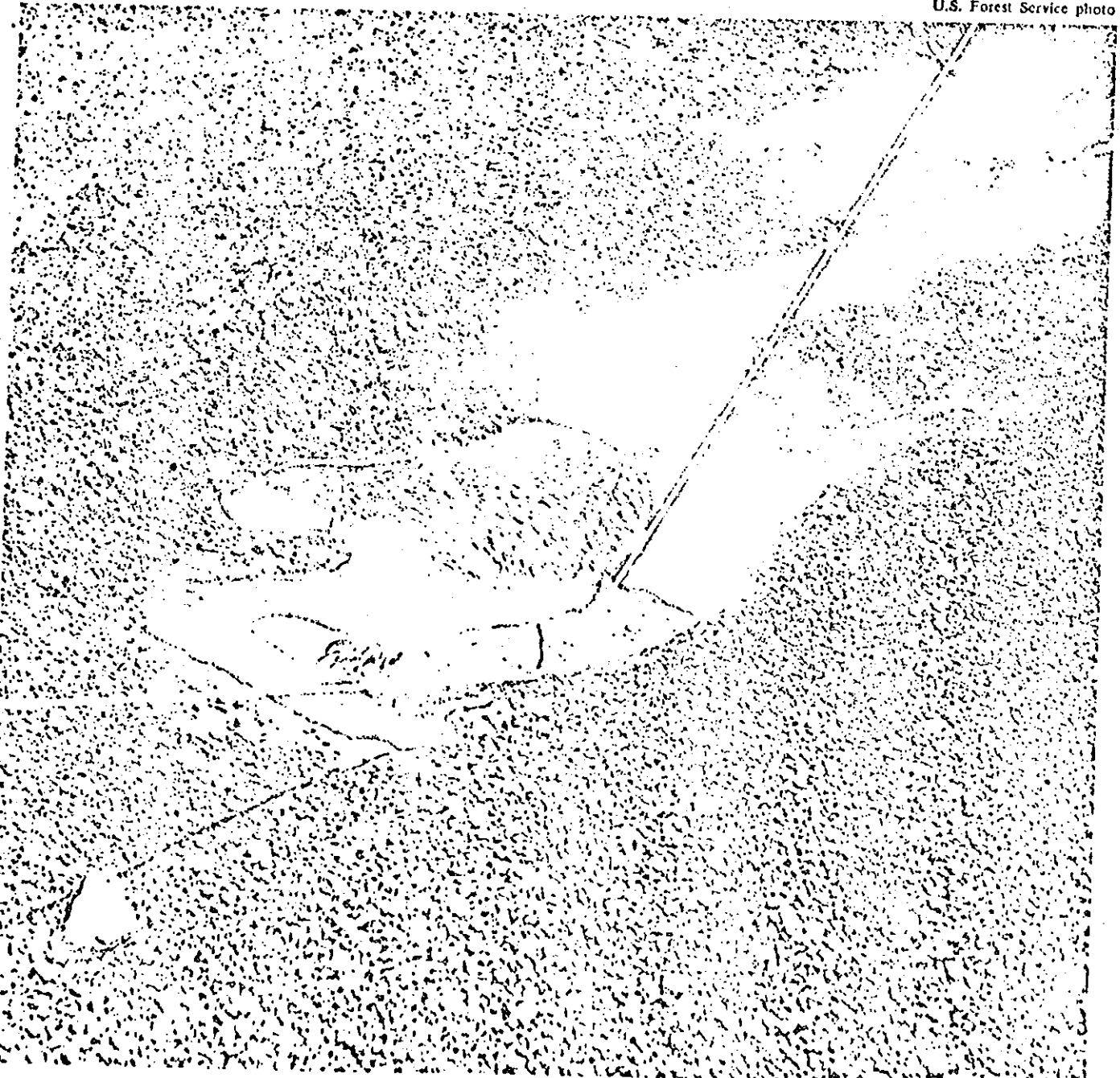
capped Club, Trout Pond recreation area for the handicapped is about 13 miles south of Tallahassee, Florida, just off State Route 373. It includes 3,500 feet of asphalt-paved paths, modified restrooms, a picnic area, a fishing pier with benches, and a swimming pool with ramp for access by those in wheelchairs. It also utilizes low flat steps for the benefit of the arthritic and elderly. There is even a spray area for those unable to go into the pool.

For those with partial sight, the paths have a white line painted on the pavement and wooden signs at hand height with words gouged out in large letters. The signs tell where the paths turn and fork to lead to picnic areas, the fishing pier, the pool, and the shelter. The totally blind can trace the words with their fingers.

<sup>1</sup>A booklet which describes the financing, design, and administration of this and similar areas can be obtained from the Forest Supervisor, Inyo National Forest, 2937 Birch Street, Bishop, California 93514.

An unusual feature of the Catalina Trail in Arizona is this stuffed and mounted badger in his natural setting. A nylon cord leads down to the animal to guide the hands of the blind. The Catalina Trail also features a mounted coyote.

U.S. Forest Service photo



For locating the signs, there are plastic plates embedded in the path, slightly raised above ground level where they can be quickly found by the blind visitor's cane. The swimming pool is especially enjoyed by the handicapped. So much so, in fact, that these people (who often spend much of their lives indoors) are sometimes forced to cut short their fun or suffer a painful sunburn. For this reason, a sun shade is being considered for all or part of the pool.

Whispering Pines Nature Trail is the second nature trail for the blind to be built by the Forest Service. It is located in the San Bernardino National Forest, northeast of Los Angeles. All costs were paid by the Wrather Corporation, producers of the "Lassie" television show, and by the Del Rosa Junior Woman's Club. The Light-house for the Blind and the San Bernardino City Schools also cooperated. The trail was dedicated May 29, 1969, with the filming of a TV program featuring Lassie and five blind children from the Orange County Division of the Braille Institute of America. The program was broadcast as part of the "Lassie" series for the following November.

The Whispering Pines trail has 23 interpretive stops with signs in braille and large type. A nylon cord guides the sightless visitors on the walk of two-thirds of a mile. The sign at one of the stations on this trail says:

**STOP and LISTEN.** Beside this sign is a log to sit on. One of the sounds you may hear on this ridge-top is the wind whispering through the lofty pine trees. The sound varies with trees at different heights. How tall do these trees sound to you? These trees average 110 feet in height. You may also hear the songs of various birds which live here, such as the flicker or the robin. You might also hear a squirrel chattering as he runs up a nearby tree gathering his winter food supply. A harmless lizard might be running through the dead leaves and needles on the forest floor, catching insects for today's meal. You will notice the forest is a very busy place. Much like the community you live in. When you decide to go on you will find the rope on the right side of the trail.

In the desert of southern Arizona, 13 miles northeast of Tucson at the edge of the abruptly rising Santa Catalina Mountains, is the Catalina Desert Trail, situated in picturesque Sabino Canyon on the Coronado National Forest. Close by is a modern visitor center where naturalists present illustrated interpretive talks. This trail for the handicapped was dedicated in January 1970 and was built largely with labor and materials provided by members of the Catalina Junior Woman's Club of Tucson and their husbands. Instead of a continuous rope to guide the sightless, a change in the path surface from gravel to concrete signals that an exhibit stop with braille signs is at hand.

#### Animals Mounted in Natural Settings

Unusual features of the trail are a mounted coyote and a badger in natural settings. A rope leads to each animal so that blind persons may touch them and "read" their exhibit signs. A mounted animal of this kind requires tender loving care by the administrator and is expensive — perhaps \$200 per year for maintenance and replacement. However, few exhibits are enjoyed more by the blind and partially blind. Another unusual exhibit is a relief map or model of the surrounding canyon and mountains which the blind can explore with their hands.

Handicapped people do not always agree on what constitutes the most enjoyable or effective facilities.

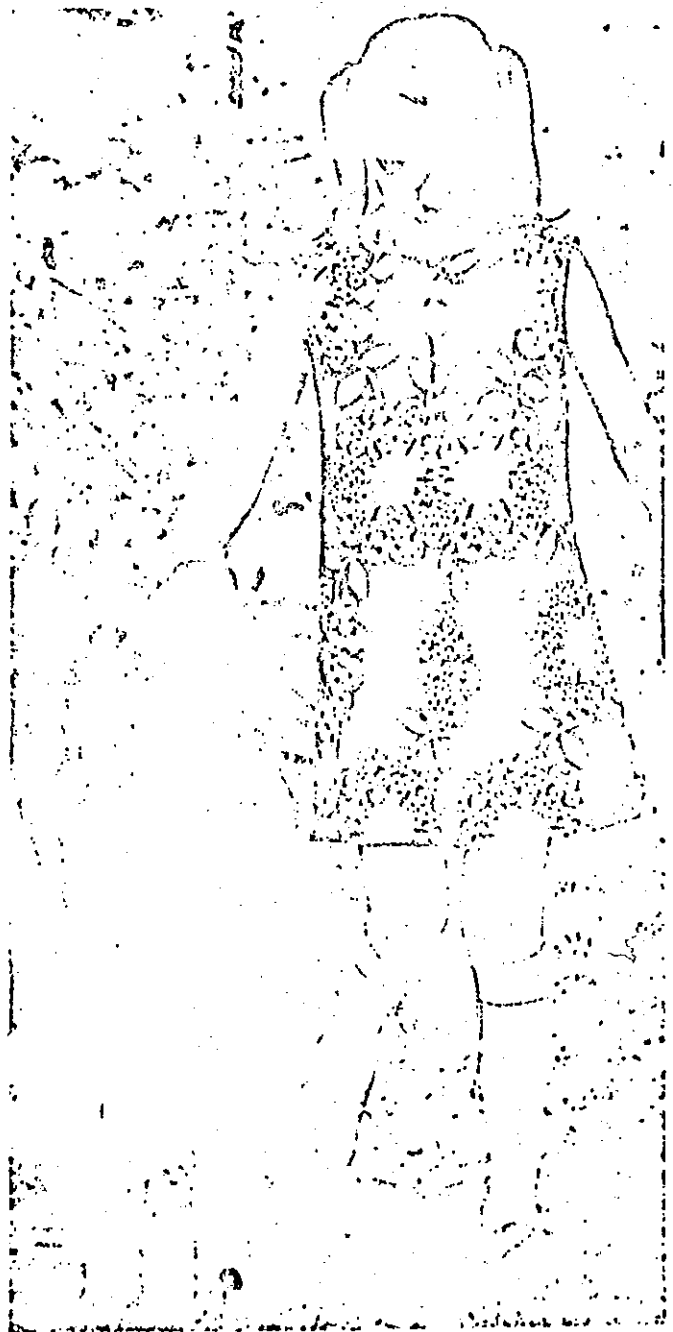
However, certain observations by designers, administrators, and the handicapped seem to agree!

- The blind, especially those who are young, often comment that nature trails are "too easy" and they would appreciate greater challenges.
- The blind thoroughly enjoy and are unharmed by the exploration (by touch) of many thorn bushes, cacti, and other such plants that are studiously avoided by their sighted friends.
- Bridges and other facilities which provide the opportunity to leisurely enjoy the sounds of moving water are very popular. Wading areas are also eagerly utilized.
- In some areas, guide ropes or cords are being replaced

*Continued on page 18*

*Kathy Martinez is guided by a nylon rope and Lassie, star of the popular television show, as she follows the Whispering Pines Nature Trail in southern California.*

*U.S. Forest Service photo*



accident control is possible is a function of the adequacy of the measures employed to identify the type and extent of potential injury-producing problems present within the field of concern. But the problem does not end merely because information is available on what is happening to whom, how it happened, and how severe it may have been. Measures are needed to tell that the efforts and money expended are indeed preventing injuries, and even death, to users. It must be recognized that the main function of the Citizen Safety Program is to tell about the safety level of a facility or area. For this reason, the argument that accidental injuries are adequate measures of safety quality is fallacious. Measures must help prevent, not record, accidents. They must tell when and where to expect trouble and provide guidelines in respect to what should be accomplished to solve the problem.

What's to be done? Is there a real interest in the safety and security of the citizen user of leisure time areas and facilities? Or does the feeling prevail that responsibilities have been discharged when a report that three new patrolmen have been added to the police force is publicized and they will have a primary responsibility of patrolling the recreation facility? Or have responsibilities been met when a large sign board is erected at the facility entrance spelling out the rules and regulations which are almost impossible to read since the attendant collects the entrance fee and shoots one through the gate to prevent traffic from becoming too congested? Important, certainly! But these remedies are only a very small part of the total problem.

During a brief review of what has been happening in respect to safety in other segments of society, it was noted that for 15 years several presidents mounted national campaigns to improve highway safety. Many states acted favorably, but also many did not and the Highway Safety Act of 1966 was the end result. On the industrial side there have been the Walsh-Healy Public Contracts Act, the Service Contract Act, the Construction Safety Act of 1968, the Mining Safety Act, the National Foundation on Arts and Humanities Act, the Longshoremen's and Harbor Workers Compensation Act, and finally, the most comprehensive of them all, the Occupational Safety and Health Act of 1970. The historical backgrounds of these two events in the realm of public safety should serve as excellent examples of the pervasive action which can be taken by the federal government when the safety of citizens is threatened.

Increasing populations with more leisure time and better transportation available to them means increased use of leisure time areas and facilities. The result will be increased accidental injuries. Planning and astute attention to the vast number of variables interactive within the system is of chief concern. Public safety, including both sides of the coin, must receive a fair share in the decision-making process. Can it be done? It is quite possible. But it means lots of hard work — hard work in collecting and analyzing injury information, working to discover potential accident sources, working to improve conditions, meeting with diverse public and private groups, and mandating and enforcing rules and regulations.

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## WHEELCHAIR IN THE WOODS

Continued from page 21

by "kick rails" along nature trails for the blind. A kick rail is usually a horizontal continuous pole placed 8-12 inches above the ground where it is contacted by the ankle or a cane (never low enough to be contacted by the toes). These rails are usually used on one side of the trail only; the appropriate side is mentioned at each interpretive sign. Guide cords or ropes often seem to be less desirable to the blind and, unfortunately, are sometimes stolen by vandals.

- It is difficult and perhaps self-defeating to design a trail for both the blind and the wheelchair user. Wheelchairs bog down or slip on trail surfaces such as pine needles or gravel which are often a tactile delight to the blind. A rule of thumb maximum grade for wheelchairs might be about 3 percent, a grade which the blind (especially

the young and active) would find uninteresting and on which they would feel pampered.

- Only a small percentage of the blind read braille. A far larger number, especially the elderly, are partially sighted and are best accommodated by signs in bold print, 18 point or larger.

It is easy to forget that the physically and mentally handicapped and the aged have the same needs and desires for outdoor experiences as the rest of us. And they are likely to appreciate the opportunity even more. There is a great challenge here for all private and public agencies managing recreation lands and facilities to create such opportunities.

Other existing National Forest facilities for the handicapped which the reader might wish to examine are:

- Cienega Canyon Nature Trail (signs in braille and English), Cibola National Forest, east of Albuquerque, New Mexico;
- "La Pasada Encantada" (The Enchanted Way) nature trail, Lincoln National Forest, near Cloudcroft, New Mexico;
- San Antonio campground, picnic ground, nature trail and fishing hole, Santa Fe National Forest, approximately 60 miles north of Albuquerque, New Mexico;
- Fishing facility for wheelchair and elderly, at Cave Springs campground in famous Oak Creek Canyon, Coconino National Forest, Arizona;
- Fishing pier reserved for handicapped people, Uinta National Forest on Tribble Fork Reservoir just south of Salt Lake City;
- "Discovery Way" — a quarter mile trail especially appropriate for wheelchairs. George Washington National Forest — near New Market Gap, Virginia (US Route 211 and Fort Valley Road);

- "Massanutten Story Trail" — a quarter mile trail, also on the George Washington National Forest, on the Fort Valley Road;
- "Lion's Tale," a nature trail for the blind with signs in braille and English, George Washington National Forest, approximately 11 miles southeast of Edinburg, Virginia, via State Route 675 and Forest Service road 274;
- Wilkerson Pass Visitor Center, west of Colorado Springs on the Pike National Forest, usable by persons in wheelchairs;
- "Sapphire Trail" at Dillon Reservoir west of Denver, Arapaho National Forest — trail and overlook under construction, to accommodate wheelchairs; and
- Clear Creek Ranger Station and Visitor Center in Idaho Springs, Colorado, Arapaho National Forest. Ramps, rest-rooms, etc., for wheelchair users.

### ADIRONDACK PARK AGENCY

*Continued from page 17*

Current capacity of public campsites within the park is 5,465 sites. Basing our prospects on the estimated rise of 2.6 percent per year, and on the same ratio of occupancy to capacity which has been observed in the past, we shall need 8,100 campsites in 1985. Estimates of annual increase in outdoor recreation activities — hunting, fishing, boating, swimming, hiking, skiing — are similar, averaging 2.5 percent. Projections made by technical consultants of the study commission indicate interior public use at Marcy Dam, for instance, at 30,000 in 1988 compared with 16,000 in 1968. Use of public campsites is seen as almost three and a half million in 1988 and public use of the

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**BERNARD**  
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**BUCK OAKS**

APPENDIX E

USER SURVEYS

INCREASE IN THE PERCENTAGE OF INDIVIDUALS IN ALBERTA WHO DID PARTICIPATE IN  
17 OUTDOOR RECREATION ACTIVITIES BETWEEN 1969 and 1972.

<u>ACTIVITIES</u>	1969 (a) %	1972 (b) %	(b-a)	$\frac{(b-a)}{(a)} \times 100$ %
Tent-camping	17	25	8	47
Trailer-camping	6	18	12	200
Pick-up camper	4	6	2	50
Hunting	14	8	-6	-43
Power boating	18	23	5	28
Canoeing	8	8	0	0
Sailing	4	1	-3	-75
Visiting Historic Parks/Sites	42	38	-4	-10
Driving for pleasure	65	68	3	5
Sightseeing from private vehicle	56	56	0	0
Snow skiing	8	6	-2	-25
Snowmobiling	15	10	-5	-33
Picnicking	68	61	-7	-10
Walking/hiking	34	41	7	20
Ice skating	23	14	-9	-39
Horseback riding	11	12	1	9
Bicycling	20	20	0	0

SOURCE: Trends in Participation in Outdoor Recreation Activities, Outdoor Recreation Research Section, National and Historic Parks, Branch, Parks Canada, August, 1973, Page 35, Table 39.

SURVEY OF RIVER VALLEY TRAILS USAGE

March 17, 1974 with observations at these locations:

1. Rainbow Valley
2. Kennedale Ravine
3. Kinsmen Park
4. Emily Murphy Park

Time: 1:00 P.M. to 5:00 P.M.

Activities:

1. Cross Country Skiing
2. Snowshoeing
3. Walking and Hiking
4. Snowmobiling
5. Tobogganing

ACTIVITIES	RAINBOW VALLEY	KENNEDALE RAVINE	KINSMEN PARK	EMILY MURPHY PARK	TOTAL
Cross Country Skiing	18	0	73	66	157
Snowshoeing	5	0	15	1	21
Walking-Hiking	3	10	3	11	27
Snowmobiling	0	15	0	0	15
Tobogganing	17	15	10	164 (Adult toboggan run closed)	206
<b>TOTAL</b>	<b>43</b>	<b>40</b>	<b>101</b>	<b>242</b>	<b>426</b>

Observers: Suzan Prufer )  
          Leslie Ayre )  
          Karen Jurick ) - Urban Studies Program  
          George Kelly ) Grant MacEwan Comm. College

Weather: 15 degrees F.  
          Cold and Windy.

SURVEY OF RIVER VALLEY TRAILS USAGE

June 15, 1974 with observations at these locations:

1. Mayfair Park
2. Kinsmen Park
3. Emily Murphy Park

Time: 5:00 P.M. to 9:00 P.M.

Activities:

1. Walking and Hiking
2. Biking
3. Jogging
4. Golfing

ACTIVITIES	MAYFAIR PARK	KINSMEN PARK	EMILY MURPHY PARK	TOTAL
Walking and Hiking	67	7	34	108
Biking	38	0	4	42
Jogging	10	0	0	10
Golfing	0	13	0	13
<b>TOTAL</b>	<b>115</b>	<b>20</b>	<b>38</b>	<b>173</b>

Observers: Jim White )  
Doreen Schultz )  
Carla Smith )  
Jane Whislin ) - C.O.R.E. Program  
Bill Hrychuk ) M.E. LaZerte Comp. High School  
Bill Glashoester)

Weather: 83 degrees F.  
Wind - 9 to 23 M.P.H.

- Note: 1) We have not as yet received the statistics from Rainbow Valley.
- 2) The survey at Kennedale Ravine was cancelled because the observers in getting directions at the Youth Development Centre were told the ravine was not safe due to use by motorcycle gangs.



SURVEY OF RIVER VALLEY TRAILS USAGE

June 16, 1974 with observations at these locations:

1. Emily Murphy Park
2. Kinsmen Park
3. Mayfair Park

Time: 10:00 A.M. to 2:00 P.M.

Activities:

1. Walking and Hiking
2. Jogging
3. Biking
4. Golfing
5. Baseball
6. Motorcycling
7. Horseback riding

ACTIVITIES	MAYFAIR PARK	KINSMEN PARK	EMILY MURPHY PARK	TOTAL
Walking and Hiking (a number of people walking pets)	112	427	110	649
Biking (coming from Whitemud hill)	27	13	14	54
Horseback (fresh horse droppings) 0			0	0
Motorcycling	1	9	0	10
Jogging	7	5	3	15
Golfing	0	30	0	30
Baseball	0	15	0	15
<b>TOTAL</b>	<b>147</b>	<b>499</b>	<b>127</b>	<b>773</b>

Notes: 1 & 2 from June 15, 1974  
survey apply to June 16/74.

Observers: Bill Hrychuk )  
Jim White )  
Bill Glashoester ) - C.O.R.E. Program  
Doreen Schultz ) M.E. LaZerte Comp. High  
Carla Smith ) School  
Jane Whislin )

Weather: 84 degrees F.

SURVEY OF RIDING STABLES IN THE EDMONTON REGION

<u>STABLES</u> <u>RIDING ACADEMIES</u>	<u>STABLED</u>	<u>OWNED</u>	<u>LESSONS</u> <u>(no. of people)</u>
Abey Stables Ltd. R. R. #5 Edmonton	61	15	approx. 30
Azure Acures Stables R. R. #3 Sherwood Park	60	16	approx. 10
Double J Riding Centre R. R. #2 Sherwood Park	85	0 don't rent	no classes
Duke Ranches Ltd. R. R. #1 South Edmonton	50	2	approx. 50
Lazy "B" Stables Ltd. 5845 - 50 Street	90	0	approx. 100
Gold Spur Riding Academy R. R. #8 Edmonton	30	36	
Murray Stables 170 Street and 109 Avenue	5	10 (Getting out of business)	10
Cuscount Stables R. R. #2 St. Albert	85 in summer more in winter	non-public information	approx. 65

## APPENDIX F

### COMPARISON OF RIVER VALLEY TRAILS AND MINI-PARKS

It is useful to compare the object of concern of this Task Force with that of a second Task Force funded by the Alberta Environmental Research Trust and organized by the Edmonton Social Planning Council: the Mini-parks Task Force.

That Task Force also was concerned about the use and design of open space in an urban environment, but the type of space is different from river valley trails in the following ways:

1. Mini-parks are pockets of open (green, park) space in a city; river valley trails are continuous strips (or more accurately lie along) open (green, park) space in a city; geometrically speaking, mini-parks are points, river valley trails are lines.
2. Mini-parks can serve as the focus of activity of a neighbourhood, and often as a visual point of reference.

River valley trails connect neighbourhoods with one another and with non-residential parts of the City (downtown, large recreational areas, the University, etc.). A neighbourhood looks in on a mini-park, out along a trail.

River valley trails also often lie along the borders of neighbourhoods and thus serve to define the neighbourhood's borders whereas as a mini-park more often serves to define the neighbourhood's heart.

3. Mini-parks are intensively designed, are cultured, as opposed to the more natural, more broadly designed, river valley trails.
4. Mini-parks are, for adults, more often "passive" recreational spaces within which one does not do much exercise; whereas river valley trails usually involve some physical exercise in their enjoyment and use.

However, there are important similarities between the two kinds of open space.

1. Both mini-parks and river valley trails should be designed, it is argued by the two Task Forces, to be useable in a way which is incidental to other activities. One passes by or through a mini-park in conducting one's neighbourhood business as a pedestrian or a cyclist and decides to rest or pause to watch children play, (or if a child, to play),

smell a flower, or enjoy the open air a little longer. One decides to get from one's neighbourhood to another part of the city by using a river valley trail so that there is pleasure and exercise in getting to one's destination as well as achieving whatever it is one has set out to do at the destination.

2. Both mini-parks and river valley trails provide an opportunity to enjoy the out-of-doors in a quieter, more aesthetically pleasing, setting than is usually found in a large city.
3. Both mini-parks and river valley trails serve to improve the general physical environment of a city through the provision of plant life.
4. Both mini-parks and river valley trails enhance the feeling of quality of life of the city by providing visually pleasing areas that one passes by or across in the course of one's daily business; they enrich the texture of a city by providing an alternative to concrete material, to private holdings, to large single-use areas.
5. Both mini-parks and river valley trails provide socializing opportunities especially if they are consciously designed to give people a reason to contact one another - e.g. a chess game in a mini-park or an interesting resting spot on a trail. It is through such socializing that a sense of community builds up in a city, a sense of communal responsibility which reduces the phenomenon of the uninvolved by-stander when somebody is in trouble. Both types of open space also provide opportunities for communal involvement in their maintenance (in the case of river valley trails, e.g., clean-up campaigns along Mill Creek) or in their development (in the case of mini-parks, e.g., the Norwood experience where despite the conflicts generated over the location of mini-parks in the community there has probably been increased communication within the community as a result of dealing with the issue).

In sum, both mini-parks and river valley trails provide the opportunity for a city to increase its quality of life by the judicious design of open space. Both mini-parks and river valley trails provide excellent examples of how the physical environment, particularly the natural (and biologically cultured) physical environment can affect the lives of city residents in terms ranging from the creation (or maintenance) of a physically healthy environment, to providing opportunities to improve one's health (through, say, exercise), to improving the social life of a community, to improving the aesthetic quality of life. In designing the physical environment, we are most effective when we consider this range of impacts of our design on the quality of life.

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