TN 7: APPLICATION OF A MATHEMATICAL MODEL TO COMPARE THE USE OF TWO POTENTIAL PARK SITES

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ABSTRACT

Calculations of predicted visitor flows to a park depends (1)on being able to evaluate the probable attendance at the new park at a given time (e.g., for a season) and (2)on being able to estimate the trends in attendance that are important in explaining changes in the predicted attendance so as to use these to estimate the-attendance at the park at given future times (e.g., for the next 10 seasons). In this paper it is reported that past research resulted in the development of a mathematical model that was used to predict use of the two proposed parks being compared. Then available trend data were used to forecast use in the future based on the given season for which use had been estimated.

A special class of non-day users, main destination day users, was designated. The other class of user considered was campers. The importance of recognizing these classes of users to making estimates of the attendance at the two parks under the development options is stressed.

Also, policy considerations relevant to how the results of analysis are presented are introduced. It is pointed out that use figures predicted for the two parks are broken down by origin and type of users (day-use and camper) for a reason. This is so that managers responsible for selecting an option will know more than total use. The manager will know "who" is being served and how.

PURPOSE

The purpose of this Technical Note is to present the rationale for, and some of the details of the methodology used to predict, attendance at two potential park sites in Ontario, the Georgian Bay site and the French River Mouth site.

INTRODUCTION

That objective is not the original one. The note was originally prepared by Cheung and other CORDS researchers to communicate a method of making estimates that was the best method these researchers could arrive at for making estimates in 1972, given their problem and the time constraints under which they worked. There was a legitimate desire to make the work known to others so that, should they find themselves in similar circumstances, they could utilize ideas and methods that had been implemented. However, since that original work was carried out, a number of research projects have resulted in good park use data (which is readily available) in a number of provinces and in the development of overnight use models that remove the need for making approximations of overnight use based on the amount of day use. As well, there have been other developments. Still, it is considered worthwhile to give some details about what was done and why, and to show what was not done because it was not possible with the data or the methodologies originally available.

It is useful to recognize that an original objective of the project of calculating visitor flows to the two sites considered here was to evaluate their relative use as National Parks. In general terms the points to be clarified by the modelling effort were (1) who could be expected to be served and (2) how. Given the data available when the study had to be done, the only variables which could be considered that would aid policy makers were types of users and origin of users. However, when the researchers started to seriously consider the information on types and origins

of users, they found that a great deal of information could and should be developed. For example, the question of who is being served can be partially answered by giving a distribution of the origins of the future visitors to a site that will be developed. However, if users from one origin come primarily during daylight hours during the week and others from more distant origins come exclusively on the weekend for camping, this information should be given to planners and managers who are considering the site or comparing its to the merits of different sites to make decisions about development. It would be inefficient, really inappropriate, to provide for weekday camping when the greatest demand occurs on weekends. Weekend capacity would be too low and weekday capacity too high. On the other hand, weekday day-use facilities and programs might be provided at a very low cost (relative to camping facilities) but because of a proposed park's location these facilities might serve only one local community. Locating the park at another site might, with the same facilities, serve more communities.

In a similar vein, when one is concerned with the origin of users, the presentation of one or two use figures that tell “the whole use story” to managers is an impossibility. In this paper, figures are given on the numbers of total visitors as well as figures on the number of total visitor-days. There are also “break outs”. The "number of visitors" to a park is obviously not a precise measure, the only measure or even the best measure of the use of a park because, for example, visitors will stay for different lengths of time in a park and many visitors will visit a park several times on one trip while others visit it many times in one season. A park visit can Last anywhere from a couple of hours to a week or more. Some measure of the mix of day-use and overnight-use and average Length of stay is necessary for the planning of services, programs, personnel needs and maintenance and for evaluating the potential regional economic impact of a park development.

Though results are not presented here, the distribution of use between weekdays and weekends is important. The possibility of developing predictive weekend and weekday use models is discussed in TN 8 where an explicit methodology for defining loading curves for different types of park users by origin is specified. More theoretical statements of the need for a variety of different park use models by user types are presented in Technical Notes 30 and 40. In this present note the need to recognize the breakdown between weekend and weekday use was clear; however at the time of writing, carrying out the actual calculations was not possible.

THE MODEL

The basic model used in calculating the use figures for the two parks considered here was:

(1) $Y(i,j) = u + (C(0)T(j) + C(1)A(i,j))\, P(i)/g(D(i,j))$

WHERE

$Y(i,j)$ = the dependent variable, the estimated number of main destination day—use visitors, in hundreds, travelling to park j from origin i per season;

u = a mean calculated in a regression;

$T(j)$ = attractiveness of park j;

$C(0)$, $C(1)$ = scaling constants as determined by regression methods;

$P(i)$ = population, in thousands, of origin i;

$D(i,j)$ = road distance, in miles, from origin i to park j;

$A(i,j)$ = alternative factor of origin i, with respect to park j, as defined in Cheung (TN 1 and 1972) and where

$g(D(i,j))$ has two alternative formulations g_A and g_B:

$$g_A(D(i,j)) = \begin{cases} D(i,j)/2 & 0 < D(i,j)) < 20 \\ D(i,j)) & 20 \leq D(i,j)) < 55 \\ D(i,j))^{3/2} & 55 \leq D(i,j)) \end{cases}$$

or

$g_B(D(i,j)) = EXP(.0706D(i,j))$.

The A and B formulations account for the different results presented later.

Equation 1 is a modified form of the main destination day-use model developed by Cheung using CORDS Park User Survey data for Saskatchewan (for details on the data see TN 1 and the CORDS Data Collection and Documentation Volume).

The reasons that the Cheung model was not used per se in making predictions for the two Ontario sites were that (1) relevant park characteristics data such as that given in Table 1 for the construction of the attractiveness variable as defined by Cheung (TN 1) were not available, and (2) it was believed that attractiveness would have a multiplicative effect rather than an additive one on the volume of use. Cheung's original model, as is seen in Equation 1, suggested a basically additive effect. This suggested that a modified "Cheung model" of the following form be used:

(2) $Y(i,j) = C(0)T(j)((1 - C(1)A(i,j))P(i))/g(D(i,j)$

Assuming that Cheung's constant term u has an effect of less than 1% as it did in predicting use of parks in Saskatchewan, it can be ignored. And omitting the attractiveness term because it is considered that it should be a multiplicative factor as indicated in Equation 2 (T(j) is attractiveness), one can proceed to develop a new model. Assuming, further, that there are (on the average) four people in a vehicle that enters a park, one obtains, by some algebraic manipulations of Cheung's equation from TN 1:

(3) $Y(i,j) = 481(1 - 0.3\ A(i,j))P(i)/D(i,j)$

Certain data are required before Equation 3 can be used to calculate visitor flows. Origin-destination figures were obtained from the Ontario Department of Lands and Forests. Since 1971 census figures were not available at the time that this research was carried out, 1971 population figures were estimated from census data by using the following equation:

(4) $P(1971) = (P(1966))^2/P(1961)$

WHERE P(y) = population in year y

This is obviously based on the assumption that the change in population between 1966 and 1971 would be the same as the increase between 1961 and 1966. It was recognized that this approximation was not very good but given other much more major inaccuracies, even using 1966 census figures would have been a minor source of error.

The preceding discussion has not been about a model that allows a park's total attendance to be estimated. It may already be clear to the reader that the model just introduced is one that is used only to calculate mean destination day-use. The total estimated use at a proposed site consists of day-use (which is sub-divided into main destination day-use and non-main destination day-use) and overnight-use. For the reasons indicated in the Introduction it is important to have estimates for these other classes of use. The problem facing the researcher or planner is, if one has only a day-use model and no time to develop other regression models, how does one obtain "scientific" estimates of the other types of use?

To this end it was necessary to use information on the ratio of main destination day-use to other uses. Camper registration figures for main destination Ontario provincial parks for the period 1968 - 1970 indicate that the ratio of day-use visits to overnight-use visits was approximately six to one (see Table 1). The number of overnight users, therefore, could be estimated once the number of day-users was known or estimated. The equations for the calculation of the total number of visitors and the total number of visitor days used were as follows:

(5) Total visitors = day visitors plus overnight visitors,

OR

(6) Total visitors = day visitors plus 1/6 (day visitors),

AND

(7) Total visitor days = (day visitors * 1) + (average length of overnight stay * estimated number of overnight visitors).

It was also recognized that there was a need to recognize the load that visitors place on a park by the differentials which are clearly noticeable in terms of an increasing average length of stay for campers from about 2.5 to 4 days from south to north. From Table 2 it may be noted that an average increase of 20 percent in camping stay occurred for Northern Ontario parks from 1968 to 1969. In the area being considered, it seemed reasonable to accept that a 10 percent per year increase in average length of stay for campers is to be expected as an average for all sites (see Table 2), at least for the next few years.

Now Equations 6 and 7 can be used for projection into the future if three rates are specified:

1. Per annum rate of increase of day-use = RIDV
2. Per annum rate of increase of overnight-use = RICV
3. Per annum rate of increase in average length of camper stay = RIALCS

The equations based on a continued constant percent growth for 5 to 10 years are :

(8) Total visitors $(1971 + t) = (\text{day-use})\ (1+RIDV)^t + (\text{overnight-use})(1+RICV)^t$

Data provided by the province of Ontario allowed calculating the needed rates. Data in Tables 2 and 3 show why RIDV = .069. RICV = .113 and RIALCS=.11 were used.

However, given the equations that have been derived, a variety of figures may be calculated. Table 4(A & B) presents the predicted 1971 total visitors and total visitor days for Georgian Bay and French River Mouth. Formula A refers to use prediction obtained from the use of g(A)D(i,j) as defined for Equation 1. Formula B similarly refers to results obtained from g(B)D(i,j). The total use figures arrived at by summing up various columns in Table 4(A & B) provided a starting point for extrapolation to future use.

A constraint on the procedure described here should be kept in mind. The use of the rates cited to this point assumes that projections do not exceed the capacity of the site being considered. If capacity is not a factor, the application of Equations 8 and 9 result in the curves shown in Figure 1. Originally there were four parts to Figure 1. This was because it was deemed necessary to present results based on the use of both Formula A and Formula B (the different distance functions introduced earlier). In each figure, a manager or planner was able to see the load that will occur at the gate of a Park on the basis of number of visitors and also the load that will be on the Park in terms of day-use and number of camper days. The four curves were used to

communicate different information that (in total) gives the planner and/or manager a better basis on which to formulate his/her views on how the Park should be designed and how it should operate. If only one of these curves were presented to managers, as indicated earlier, it would be impossible to recognize how a balance should be struck between developing day-use areas and developing campgrounds.

TABLE 1: STATISTICS ON SOME ONTARIO "MAIN-DESTINATION" PARKS*

Name of Park	Acreage	Day-use Picnic Tables	Length of Day-use Beach (ft.)	Day-use Parking Acreage
Oastler Lake	78	165	300	2.0
Arrowhead	1652	98	900	2.5
Sturgeon Bay	35	**	**	**
Killarney	84350	50	600	**
Grundy Lake	6313	552	800	8.0
Restoule	1635	**	**	**
Mikisew	420	90	1500	2.5
Killbear Point	4340	489	800	1.5

Name of Park	Number of Day-Use Parking Spaces	Number of Developed Campsites			Day-use/Campers		
		1968	1969	1970	1968	1969	1970
Oastler Lake	250	170	170	183	8.	7.	5.
Arrowhead	210	102	253	253	3.	4.	4.
Sturgeon Bay	**	87	89	87	5.	3.	8.
Killarney	100	102	125	160	13.5	9.	8.
Grundy Lake	500	537	537	540	2.	4.	4.
Restoule	**	229	229	225	2.	3.	4.
Mikisew	226	256	256	256	2.	5.	5.
Killbear Point	100	878	939	1018	4.	6.	5.
		Average			5.	5.	5.

*** Being a main destination park refers to having over 50% main-destination visitors as reported by the province of Ontario.**

**** Unknown.**

TABLE 2: AVERAGE LENGTH OF STAY - SUMMARY STATISTICS

Some Southern Ontario Provincial Parks	Average Length of Stay in Days 1968	1969	1970
Holiday Beach	2.3	2.2	2.2
Ipperwash	4.4	4.9	5.0
Long Point	2.8	2.1	2.7
Pinery	3.1	2.3	2.2
Rock Point	1.6	1.4	1.6
Rondeau	2.4	3.0	2.2
Selkirk	2.0	1.7	2.0
Turkey Point	1.8	1.7	1.8
Wheatley	1.8	2.2	2.5
Craigleith	1.9	1.5	2.0
Inverhuron	2.4	2.8	3.7
Point Farms	2.1	2.4	2.4
Sauble Falls	2.3	1.7	2.3
Bass Lake	1.9	2.2	1.9
Devil's Glen	1.5	1.5	1.3
Earl Rowe	2.1	2.1	2.1
Mara	1.6	1.9	2.0
Sibbald Point	2.8	2.7	2.7
Six Mile Lake	1.9	1.7	2.0
Average	2.4	2.3	2.4

% Average Annual Change for South = 0.0%

Some Northern Ontario Provincial Parks	Average Length of Stay in Days 1968	1969	1970
Arrowhead	1.7	2.2	2.5
Grundy Lake	2.0	3.0	3.0
Killbear Point	3.2	4.7	5.2
Mikisew	2.0	3.7	3.8
Oastler Lake	2.1	2.6	2.7
Restoule	2.5	4.2	4.5
Sturgeon Bay	2.0	3.2	3.3
Missinaibi Lake	-	3.7	3.8
Wakami Lake	-	5.1	5.3
Killarney	4.0	2.3	3.9
Windy Lake	3.1	1.8	3.0
Average	2.5	3.3	3.7
% Average Change 1969)		**32% (1968 -**	
% Average Change 1970)		**12% (1969 -**	

% Average Annual Change for North = 22%

"Over-all Annual Average" = RIALCS = (0.0 + .22)/2 = .11(11%)

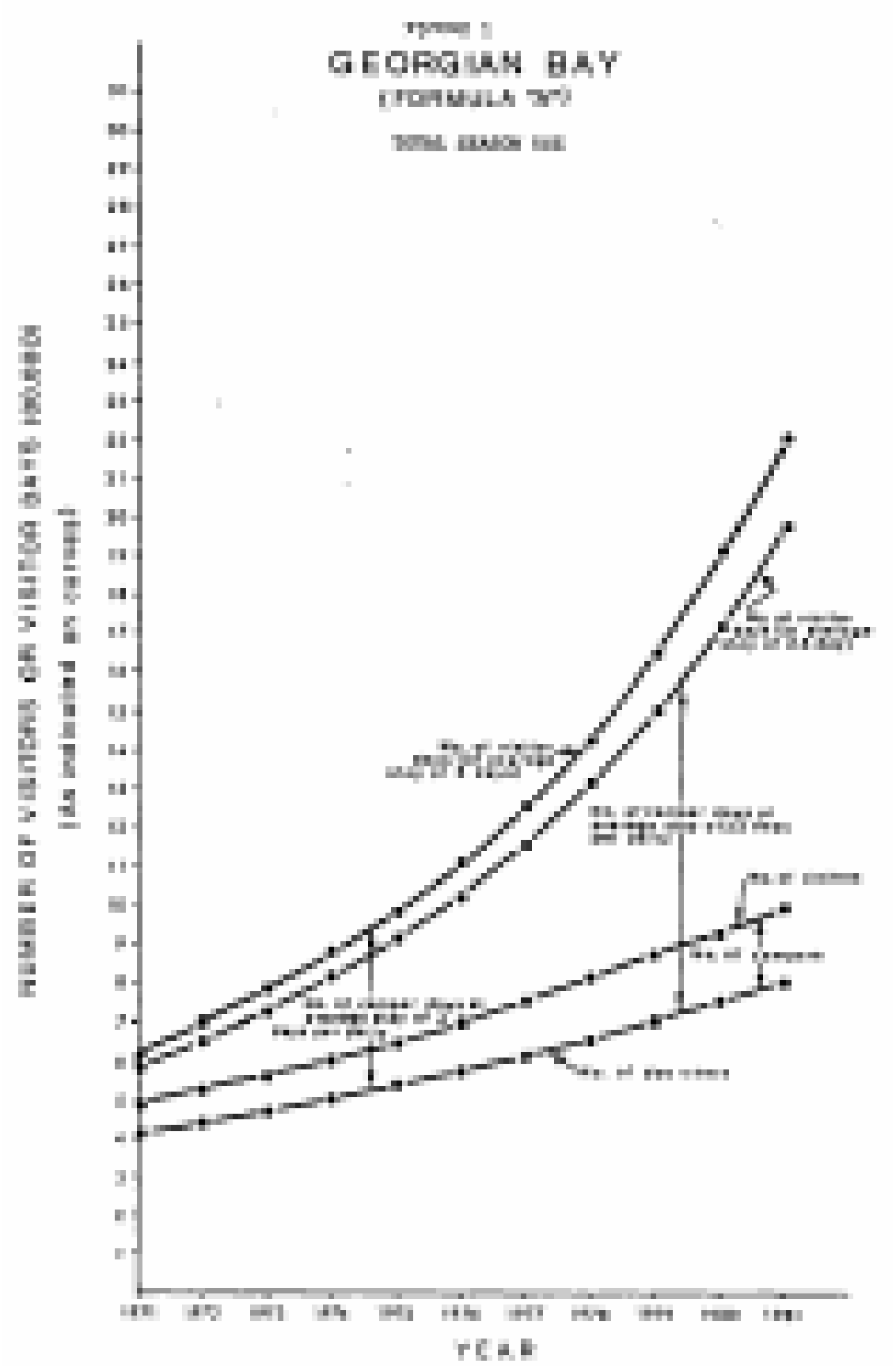
GEORGIAN BAY
YEAR

TABLE 3: CHANGE IN DAY-USE AND CHANGE IN CAMPER USE:SUMMARY STATISTICS

Year	Total Season Day-Use	% Change in Day-use	Total Season Camper Use	% Change in Camp Use
1960	5,692,578		592,103	
1961	5,352,811	-6.0	862,559	45.
1962	6,757,867	26.2	1,063,127	23.
1963	7,685,952	13.7	840,491	-20.
1964	8,230,937	6.6	916,281	9.
1965	7,973,196	-3.1	902,472	-1.
1966	8,796,884	10.3	994,787	10.
1967	9,037,442	2.7	1,155,091	16.
1968	8,320,299	-7.9	1,119,912	-3.
196S	9,099,297	9.4	1,3b0,639	21.
1970	10,640,726	16.9	1,531,528	12.
	Average	6.9	Average	11.
		RIDV=0.069		**RICU=0.113**

DISCUSSION

Understanding what the modified Cheung model implies about attractiveness is important in evaluating whether the model proposed should or should not be used. To test whether the model did appear to be appropriate to the Ontario situation, use figures were generated for several Ontario Parks and these were compared with the use figures actually observed at these Parks. This gave a picture of whether the model is appropriate in terms of showing that the Parks in Ontario appear to follow roughly the model established based on Saskatchewan data.

One should note that the Ontario Parks that were considered and compared with the proposed Parks were not operating at capacity. When one examines Figure 1, one sees a drastic increase in the use of the proposed sites being predicted. Now, obviously the parks should not be opened with their 1981 capacity if they are to be opened in 1971 or 1972. Rather an approach should be taken that opens a certain amount of capacity to see if the use projections appear to be following the appropriate trajectory.

One point that cannot be stressed enough is that all of the estimates made in this article are subject to a great deal of error. Park planners and designers should not take the figures as gospel truth but take them as (at best) a plus or minus 50% estimate. Given this fact an approach to planning called Discreet Instrumentalism appears to be appropriate. Under this procedure a development plan is established but, at the same time, an evaluation program is set up in parallel so that the development plan can be modified if use estimates are not following the plan trajectory or if, in some other way, the park is not operating as it was planned that it would operate.

TABLE 4(a): USE PREDICTION BY ORIGIN

	NUMBER OF MAIN DESTINATION DAY USERS				NUMBER OF NON-MAIN DESTINATION DAY USE				TOTAL NO. OF CAMPERS			
	VISITORS TO GEORGIAN BAY		VISITORS TO FRENCH RIVER		VISITORS TO GEORGIAN BAY		VISITORS TO FRENCH RIVER		VISITORS TO GEORGIAN BAY		VISITORS TO FRENCH RIVER	
	FORMULA A	FORMULA B	FORMULA A	FORMULA B	FORMULA A	FORMULA B	FORMULA A	FORMULA B	FORMULA A	FORMULA B	FORMULA A	FORMULA B
Niagara Falls	3,895	5,372					1,412	2,453	634	895	235	409
St. Catharines	6,805	8,980					2,177	4,016	1,090	1,497	363	673
Welland	2,624	3,803					1,078	1,761	437	634	180	294
Hamilton	22,912	26,604	6,320	11,426					3,819	4,434	1,053	1,904
Brantford	3,698	4,713					1,344	2,154	616	786	224	359
Guelph	2,290	3,274					977	1,527	382	546	163	255
Galt	2,728	3,040					1,039	1,402	455	507	173	234
Kitchener												
Waterloo	6,959	11,431					2,423	5,137	1,160	1,905	404	856
Woodstock					2,126	2,639	906	1,245	354	440	151	209
Stratford					1,910	2,510	854	1,189	318	418	142	193
London					6,742	11,871	2,404	5,334	1,124	1,979	401	889
St. Thomas					1,747	2,191	801	1,047	291	365	134	175
Sarnia					2,536	4,529	1,092	2,083	423	755	182	347
Chatham					1,981	3,081	897	1,441	331	514	150	240
Windsor					5,302	13,835	2,144	6,305	884	2,306	357	1,034
Owne Sound	2,286	2,387	940	1,097					381	398	151	183
Burlington	5,673	6,108	1,755	2,625					946	1,018	293	439
Oakville	13,553	14,212	3,585	5,584					2,259	2,369	598	931
Mississauga	9,406	9,877	2,487	3,538					1,568	1,646	415	590
Toronto	202,913	231,109	43,187	62,979					33,819	38,518	7,198	10,497
Detroit					21,186	47,189	7,946	29,839	3,531	11,198	1,324	4,973
TOTALS	327,494	369,759	206,521	200,250	82,114	201,693	44,652	111,732	68,271	95,245	41,865	52,001

TABLE 4(b): USE PROJECTION BY ORIGIN

	VISITORS TO GEORGIAN BAY AT AVERAGE STAY OF 3 DAYS		VISITORS TO FRENCH RIVER AT AVERAGE STAY OF 3 DAYS		VISITORS TO GEORGIAN BAY AT AVERAGE STAY OF 2.5 DAYS		VISITORS TO FRENCH RIVER AT AVERAGE STAY OF 4.5 DAYS	
	FORMULA A	FORMULA B	FORMULA A	FORMULA B	FORMULA A	FORMULA B	FORMULA A	FORMULA B
Niagara Falls	1,902	2,685	705	1,227	1,585	2,238	1,058	1,841
St. Catharines	3,270	4,491	1,089	2,019	2,725	3,743	1,634	3,029
Welland	1,311	1,902	540	882	1,093	1,585	810	1,323
Hamilton	11,457	13,302	3,159	5,712	9,548	11,085	4,739	8,568
Brantford	1,843	2,358	672	1,077	1,540	1,965	1,008	1,616
Guelph	1,146	1,638	489	765	955	1,365	734	1,148
Galt	1,365	1,521	519	702	1,138	1,268	779	1,053
Kitchener								
Waterloo	3,480	5,715	1,212	2,568	2,900	4,763	1,818	3,852
Woodstock	1,062	1,320	451	624	885	1,100	680	936
Stratford	954	1,254	426	594	795	1,045	639	891
London	3,372	5,937	1,203	2,667	2,810	4,948	1,805	4,001
St. Thomas	873	1,095	402	525	728	913	603	788
Sarnia	1,269	2,265	546	1,041	1,058	1,888	819	1,562
Chatham	993	1,542	450	720	828	1,285	675	1,080
Windsor	2,652	6,918	1,071	3,102	2,210	5,765	1,607	4,653
Owen Sound	1,143	1,194	453	549	953	995	680	824
Burlington	2,838	3,054	879	1,314	2,365	2,545	1,319	1,971
Oakville	6,777	7,107	1,794	2,793	5,648	5,923	2,691	4,190
Mississauga	4,704	4,938	1,245	1,770	3,920	4,115	1,868	2,655
Toronto	101,457	115,554	21,594	31,491	84,548	96,295	32,391	47,237
Detroit	10,593	33,594	3,972	14,919	8,828	27,995	5,958	22,379
TOTAL	204,813	285,735	125,595	156,003	170,689	238,119	188,405	234,015

TABLE 5: ATTRACTIVENESS DETERMINATION

	FRENCH RIVER MOUTH BASED ON 0.6 ATTRACTIVENESS FACTOR AND 1.0 DISTANCE CORRECTION		GEORGIAN BAY ISLANDS BASED ON A 1.0 ATTRACTIVENESS FACTOR AND $\frac{1.0}{(1-.31)}$ DISTANCE CORRECTION*	
	Using GRUDY LAKE as a control site***		Using KILLBEAR as a control site***	
CITY	FORMULA A	FORMULA B	FORMULA A	FORMULA B
Hamilton	1.6	1.0	2.6	2.3
London	2.1	1.1	4.5	2.9
Toronto	.9	.6	1.9	2.0
Sudbury**	1.2	1.6	1.2	1.1
St. Catharines	2.0	1.3	2.8	2.3
Kitchener - Waterloo	1.8	1.0	5.7	3.6
Oakville	1.3	1.0	2.8	2.9
Barrie	1.6	.47	1.1	1.9
AVERAGES	1.6	.92	3.1	2.6
	Average for the two formulas 1.25		Weighted averages = 2.5****	

*The distance correction is determined from $q(d) = e^{-.0706d}$ so that for 15 miles of extra travel

$$q(d_1)/q(d_2) = e^{-.0706(d_1 - d_2)}$$

$$= e^{-.0706(15)}$$

$$= e^{-1.05}$$

**Sudbury figures are low because the alternative factor for Sudbury does not take into account U.S. areas or non-park areas that compete for use by Sudbury's population.

***The actual formula used in claculations used 1968 camper figures so camper visitation observed was compared to (camper visitation predicted) X (growth correction). The growth correction reduced visitation to about the level expected based on 1968 population by multiplying by a rate which is actually a 2½ year correction. In terms of a formula:

$$\text{Attractiveness} = \frac{\text{No. observed campers}}{(1-r/2)}$$

$$r = \frac{\text{population 1966-popul. 1961}}{\frac{1}{2}\text{ (popul. 1966 + popul. 1961)}}$$

****Since Toronto is a major source of users a weighted average is used rather than (2.1 2.5)/2 [e.g. average $j = \sum_i$((users i)) (attractiveness j))/(users i)]

Certainly, when planning for a park is done based on the kind of computations illustrated in this note, it is critical to set up a use monitoring plan so that based on revised use estimates when the park actually opens, one sets up a scheme for managers and planners that will allow them to know if the park is having the use levels expected. If there were other objectives for the park (such as regional development etc.) information about the opening of enterprises, data on total sales etc. should be accumulated so that the goals for the park do not become lost in a procedure that sees an original intent handed over for implementation to people who may not know what that intent was and therefore may not be in a position to understand what is not happening that should be happening. This particular theme is taken up in more detail in CORDS TN 40.

The capacity of sites presents special problems to modelling efforts. Examination of Ontario's data for Killbear and other sites (Table 6) suggests the guidelines given in Table 7. The values in Table 7 assume a ratio of 6 to 1 day-use visitors to campers.

Table 7 provides guidelines that should be considered reasonable capacity relations for use that tends to be at least 10% below design capacity. If a park runs at capacity, traffic considerations, crowding and other factor may affect use. It must be emphasized that the number of sites given in Table 7 should not be regarded as a design guideline. Care must be taken to ensure that "natural" and other biological balances are not upset by the creation of park facilities.

Given Killbear and other parks as providing back-up capacity for the proposed sites, one should expect to reach a balance between expected use and the capacity of the site by accepting the fact that biological and social considerations should define a capacity which should not be exceeded. If use predictions exceed the design capacity, and if the park is to be a stable ecological entity, then use must be redistributed to conform to capacity.

CONCLUSION

This paper has traced the steps that have resulted in the estimation of various park use figures and suggestions that planners and policy makers have found useful. Data were supplied to planners to help ensure that the "best" answer to a planning problem that could be derived at the time was arrived at with full knowledge of the problems facing the researchers as they attempted to apply the model discussed in this paper.

It is primarily in the spirit of seeking reaction to their research philosophy presented that this paper was written. The greatest value that may come from it is that the critical and constructive reaction should be a response to what figures policy makers really need. It is certainly easy to attack the paper on the basis that (1) a Saskatchewan day-use model was applied to Ontario, (2) that adequate consideration was not given to the breakdown between weekend and weekday use, and (3) that proper consideration was not given to the effect of the "baby boom" and other demographic forces on the growth of park use in Ontario. To focus on these problems, however, is to miss the more important points and perspectives which are contained in this study. Planners, managers and policy makers often phrase questions regarding development options in casual imprecise forms that vary with each proposed development. More reliable, valid and useful data could be obtained if the data collection and analysis of various use figures were standardized considering real needs. The authors believe that it is the responsibility of the researcher to comment on the practical significance of the numbers he/she arrives at. To guide policy makers and planners to ask for the right information: the researcher should not just react directly to requests but should also understand policy and planning well enough to guide planners and managers away from information they should not use, as welt as guide them towards information that they should use (for reasons that follow logically from objectives).

TABLE 6: SOME FIGURES RELEVANT TO CAPACITY

Name of Park	July - August % Occupancy * No. Campsites[1]	1970 Number of Campers[1]	Ratio(1)[1]
Oastler	181	19,424	107.3
Arrowhead	124	14,279	115.2
Sturgeon Bay	84	7,682	91.5
Killarney	102	7,559	74.1
Grundy Lake	373	35,656	95.6
Restoule	108	6,620	61.3
Mikisew	136	10,166	74.8
Killbear Point	753	42,700	56.7

Name of Park	No. of Day-Use Picnic Tables	Number of Day-Users[1]	Ratio(2)[1]
Oastler	165	110,698	670.9
Arrowhead	98	67,644	690.2
Sturgeon Bay	**	67,109	
Killarney	50	62,762	1,255.2
Grundy Lake	552	150,564	272.8
Restoule	**	31,063	
Mikisew	90	54,371	604.1

[1] Per Season or Season Average)

$$(1) \quad \frac{\text{(Number of Campers)}}{\text{\% (Occupancy) (Number Campsites)}}$$

$$(2) \quad \frac{\text{(Number of Day-Users)}}{\text{(Number of Day-Use Picnic Tables)}}$$

TABLE 7: CAPACITY CONSIDERATIONS

Total Season Visitation	#Campsites Assuming 4.5 Days Average Stay	#Campsites Assuming 3 Days Average Stay	#Day-Use "Sites"*
500,000	1,800	1,200	1,250
400,000	1,500	1,000	1,000
300,000	1,250	830	750
250,000	1,000	667	625
200,000	750	500	500
100,000	375	225	250

* **The above assumes a ratio of 6/1 of day-user visitors to campers. The figures for day-use sites are not easily interpreted, but reflect "turn-over" and the fact that some day-users do not use "developed" sites or "double up".**