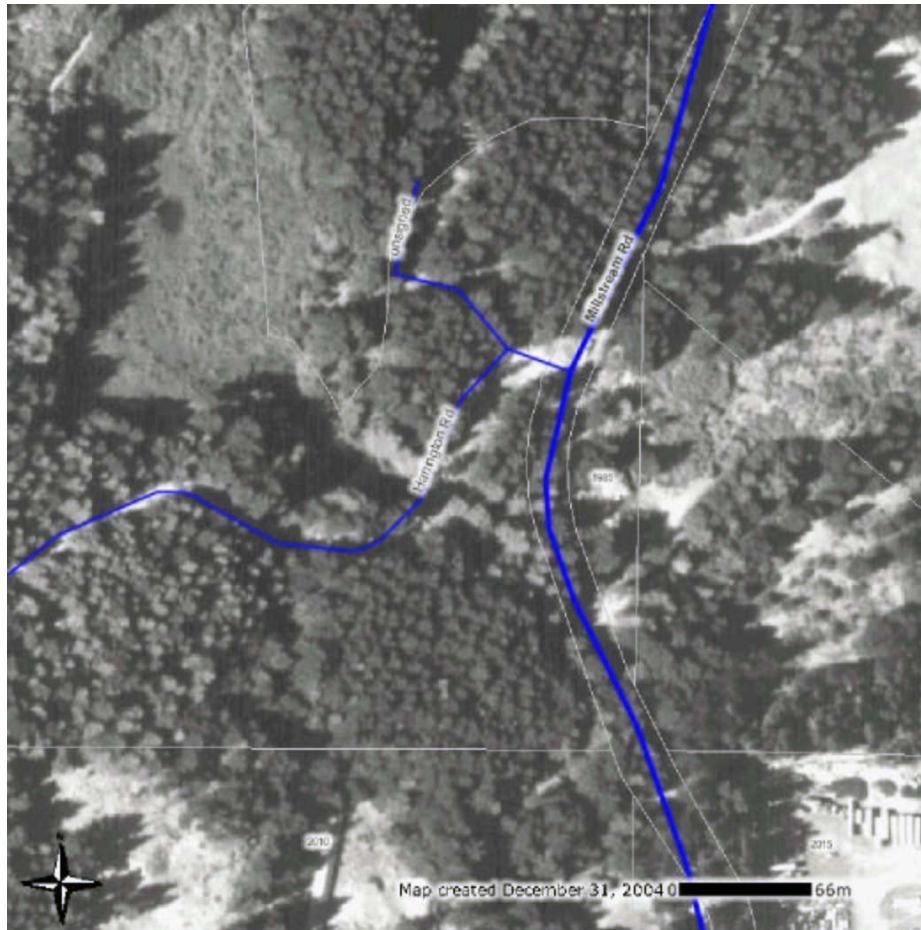


# **Bear Mountain Golf and Country Club Hannington Road Access Traffic Report**



District of Highland

January 2005

NovaTrans Engineering Inc.

## 1) Project Description

This project is a transportation study in support of rezoning and development of portions of the Bear Mountain Golf and Country Club development occurring within the District of Highlands. The majority of the project occurs within the City of Langford (Figure 1 – Keyplan) with present access via Millstream Road at the Bear Mountain Parkway intersection and future access via the Bear Mountain Parkway directly to the Trans Canada Highway. The District of Highlands portions will access Millstream Road via Hannington Rd. This intersection is the subject of this study.

## 2) Expected Land Uses

The District of Highlands reports that the Bear Mountain rezoning proposal includes the following land uses:

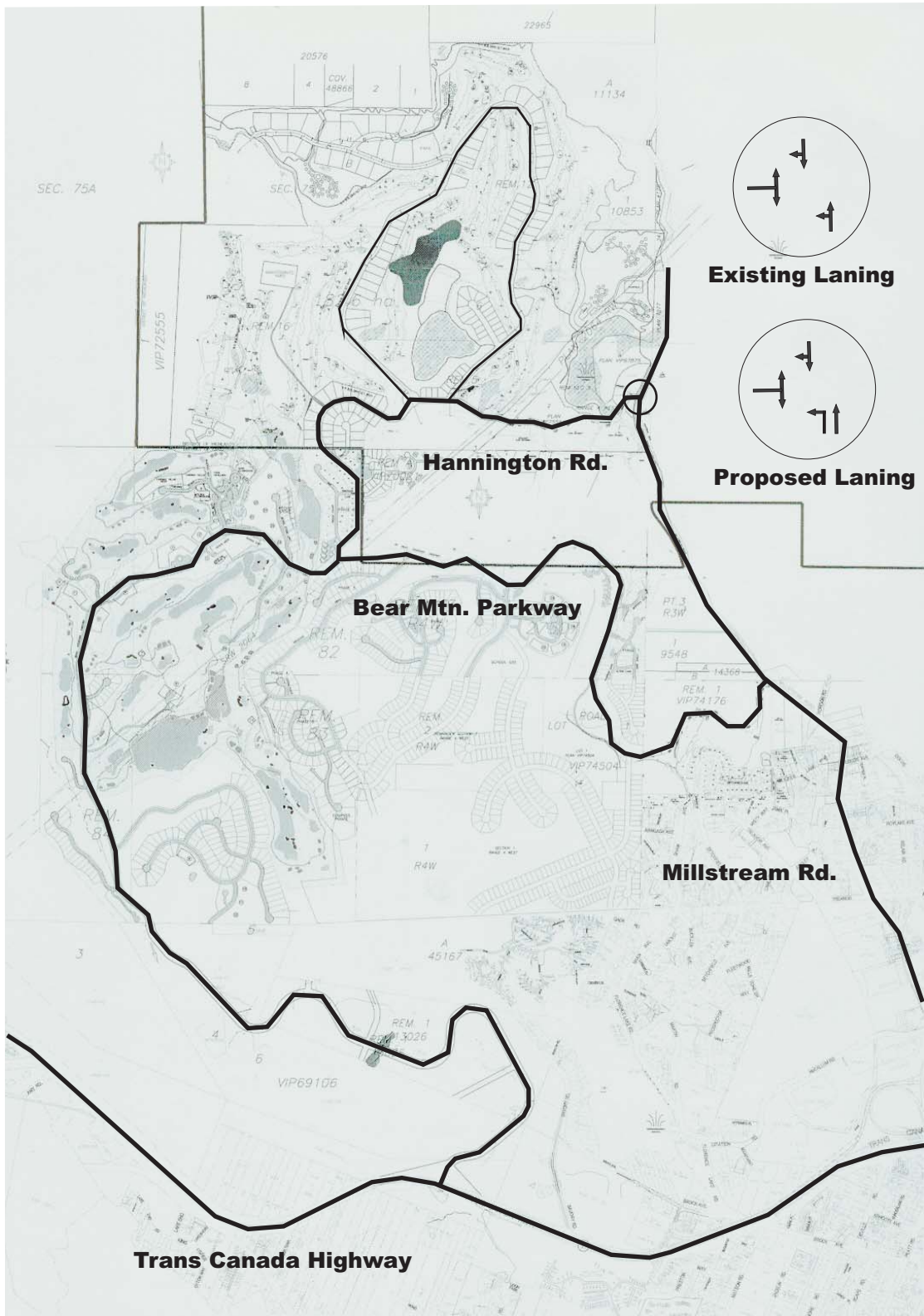
As discussed, the District requires a traffic study that takes into account the elements of the Bear Mountain rezoning proposal. This includes:

- 150 single family dwellings, 30 of which may be townhouses
- 250 tourist accommodation units, at least 100 of which must be included in a hotel. The remaining units will be cabin type units scattered over the site. This aspect of the development includes a resort hotel and will include accessory uses such as restaurant, licensed establishments, retail sales. There is also proposed a "lodge" which would include tourist accommodation units, and which may include licensed establishments, recreation facilities for guests, and a common dining area.
- 1100m<sup>2</sup> commercial space near the existing municipal hall
- 18 hole golf course with club house and accessory uses which may include restaurant, licensed establishments, retail sales
- Golf academy

Other land uses regarding the Hannington/Millstream intersection which must be accounted for include:

- Regular truck traffic, which occurs now and which will likely increase during construction
- There has been a 57 lot subdivision approved near the intersection.

These land uses and their expected traffic generation are presented in Table 2 below. Where there was some question as to the trip generation that could be expected a conservative assumption was generally selected. These assumptions are listed below:



SCALE : NTS

DATE : Dec 2004

DES. BY : MGG

**NovaTrans Engineering Inc.**  
*Innovative Transportation Solutions*

FIGURE 1  
 AREA KEYPLAN

- The 150 residential units were all assumed to be single family rather than splitting out an as yet unknown number of multi-family units. Single family units have a higher trip generation than multi-family units.
- The “Resort Hotel” category was used for all of the tourist accommodation units as it was felt to best represent the typical travel and trip generation patterns resulting from these units regardless of whether they be hotel or “cabin-type” (with 1 parking space) units.
- The Golf Academy was assumed to be included in the trips generated by the 18-hole golf course as the ITE Trip Generation Manual states that some of the Golf Courses surveyed include “driving ranges and clubhouses with a pro shop”.

**Table 2**  
**Bear Mountain : Hannington Road Access Study**  
**Area Development Trip Generation**

Land Use			Trip Generation									
Type	Size	Measurement	AM Peak			PM Peak			Saturday			
			rate	in	out	rate	in	out	rate	in	out	
<b>Other Hannington Rd. Developments</b>												
Residential - Single Family	57	units	1.00	15	42	1.2	44	25	1.08	31	31	
<b>Bear Mountain : Highlands</b>												
Residential - Single Family	150	units	1.00	39	111	1.2	115	65	1.08	81	81	
Residential - Medium Density	0	units	0.49	0	0	0.68	0	0	0.61	0	0	
Golf Course	18	Holes	2.80	42	9	3.7	35	32	5.10	66	26	
Retail Commercial	1100	sq.m.	0.78	5	3	4.2	23	23	5.3	29	29	
Business Park	0	sq. m.	2.20	0	0	1.7	0	0	0.21	0	0	
Banquet	0	seats	0.00	0	0	0.28	0	0	0.00	0	0	
Resort Hotel (330)	100	rooms	0.31	22	9	0.42	18	24	0.86	48	38	
Tourist Accomodation (330)	150	rooms	0.31	33	13	0.42	27	36	0.86	72	57	
Total				109	131		191	144		224	174	

### 3) Intersection Geometry

The intersection of Hannington Rd. with Millstream Rd. is a T-intersection with Millstream Rd. being the major roadway running north to south, and Hannington Rd. being the minor roadway teeing in from the east side. The intersection presently has a single lane in each direction on both Hannington and Millstream roads with no turning bays or significant intersection widenings for turning vehicles. The Hannington Road leg is poorly placed on the outside of a curve with some limitations to view lines, particularly to the south.

A previous design for an upgraded intersection was done by JBR Highway Consulting Ltd. In support of the 57-lot subdivision referred to earlier. Apparently, traffic from the Bear Mountain Development was allowed for in this design, however, no report was provided to confirm this. The upgrade design generally allows for widening to the outside of the curve to allow for the introduction of a 24 m. storage bay for the northbound to westbound left turning traffic.

#### **4) Traffic Forecasting**

The periods typically of consequence are the weekday AM and PM peak hours, as well as the Saturday PM peak hour. The main movement of concern is the northbound to westbound left turn into Hannington Rd. from Millstream Rd. south. As this is a “return” trip from work or shopping via Millstream Road south it is very small in the AM peak hour. Therefore the weekday and Saturday PM peak hours are the critical hours selected for analysis.

The planning horizon period is a 10-year period requiring traffic forecasts with development for the year 2014. A step-wise approach to the development of future traffic volumes was utilized. Each of the steps is described below with the results and interim steps for each of the 2014 weekday and Saturday PM peak hours provided appended to the report.

**Year 2004 Base Forecast:** Traffic volume counts collected in 2002 by Ward Consulting for the intersection of Treanor and Millstream Rd. were used as the basis of the Base Traffic forecast. In 2002, between Treanor and Hannington there were only a few small roads, namely Hoy Lake, Goldie, Hordon and River Road. Consequently a conservative assumption was made that all of the traffic approaching and departing Treanor from Millstream North was present at Hannington Rd. A 1.5% yearly growth factor was then applied to the 2002 volumes for the 2004 Base forecast. Recognizing that present turning volumes at Hannington Road are low consisting mainly of volumes to and from the Municipal Hall some low volume estimates were added to and from the Hannington leg.

**Year 2014 Base Forecast:** As for the 2004 Base Forecast a 1.5% yearly growth factor was applied to the 2002 volumes for the 2014 Base forecast. However, because of the low volumes presently accessing the Hannington leg, the volumes from the 57 unit single family unit development as specifically calculated in Table 2 were also added to the Base Forecast.

**Bear Mountain Development Traffic Forecast:** Trips forecasts were generated from each of the different land uses as described earlier in Table 2. 20% of the trips generated were estimated to remain local, within the Bear Mountain development, accessing either shops services, golf facilities etc. in the village centre area or friends, parks etc. throughout the development. The remaining 80% were estimated to enter and exit the development via the Hannington at Millstream intersection. Given the proximity and direct routing to this intersection from the Bear Mountain Highlands land use areas, and the fairly indirect routing via the Bear Mountain Parkway, very few trips would be expected to exit via the Bear Mountain Parkway, these would be included within the 20% local figure above.

**Year 2004 and 2014 With Development Forecasts:** Once the above forecasts were carried out it was a simple task to add the development forecast to the Base Traffic forecasts to achieve the final “With Development” Traffic Forecasts.



24 m. left turn bay places the end of the storage bay into the longer view from the roadway tangent section to the south.

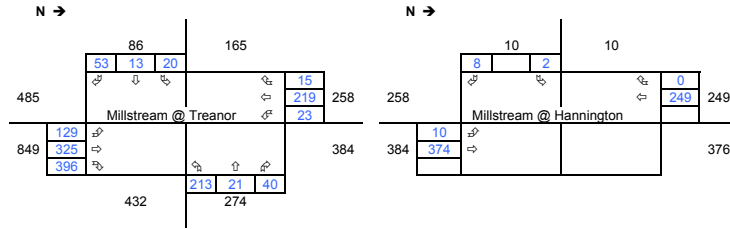
In addition to this, during construction heavy vehicles carrying rock and fill can be expected to utilize this access. A dump truck with a pup would completely fill a 15 m. storage bay. Slower start up speed would mean that the truck requires a longer gap than usual in the approaching southbound traffic. In addition, slower speeds coming up the hill northbound on Millstream Rd. may have created a following platoon of traffic some of which may also want to turn left onto Hannington. At least one additional car length is recommended which would put the desirable length at 22 m.

## **5) Recommendations**

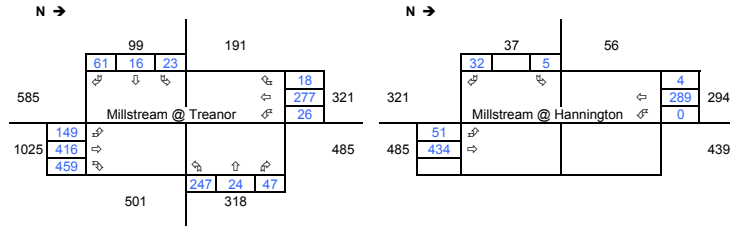
As a result of the above the 24 m. left turn bay as designed by JBR Highway Consulting Ltd. is recommended.

**Bear Mountain : Highlands Traffic Study**  
**Weekday PM Peak Traffic Volume Forecast**

**Year 2004 Base Traffic Forecast**

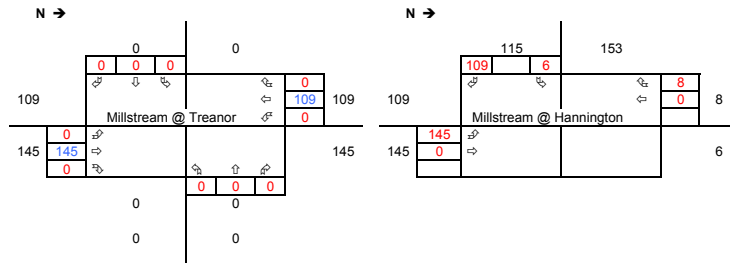


**Year 2014 Base Traffic Forecast**

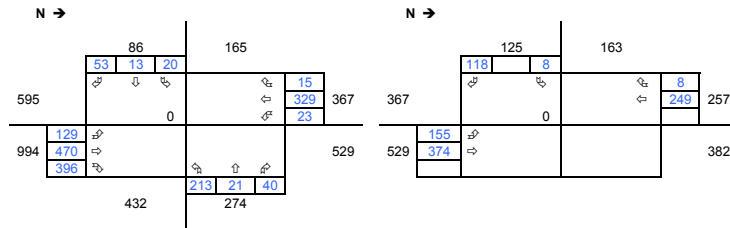


**Bear Mountain Development Traffic Forecast**

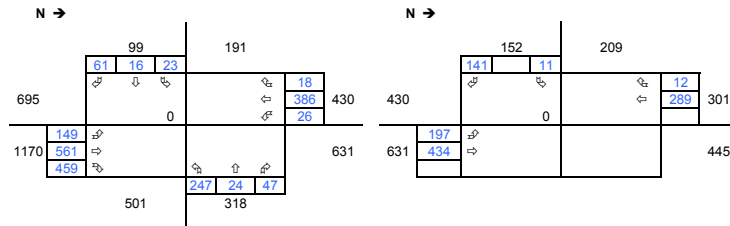
	In	Out	Split
100%	191	144	North 5%
20% Local	38	29	South 95%
80% External	153	115	



**Year 2004 with Development Traffic Forecast**

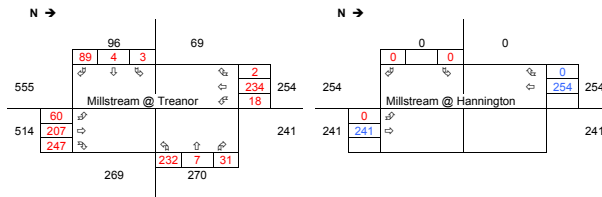


**Year 2014 with Development Traffic Forecast**

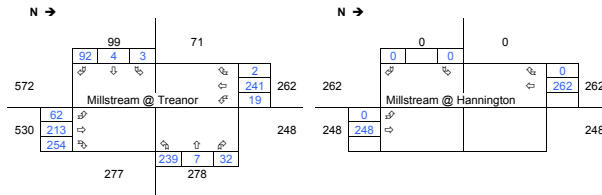


**Bear Mountain : Highlands Traffic Study**  
**Saturday PM Peak Traffic Volume Forecast**

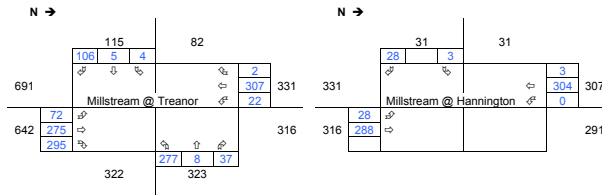
**Year 2002 Traffic Data (T. Ward)**



**Year 2004 Base Traffic Forecast**

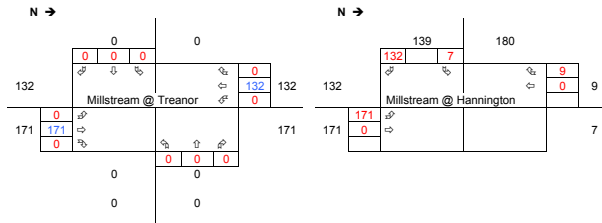


**Year 2014 Base Traffic Forecast**

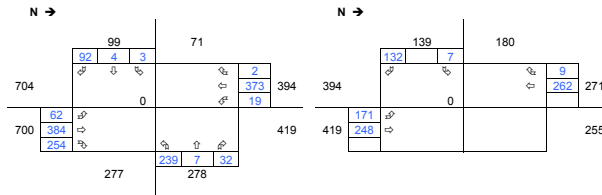


**Bear Mountain Development Traffic Forecast**

####	In	Out	Split
20% Local	45	35	North 5%
80% External	180	139	South 95%



**Year 2004 with Development Traffic Forecast**



**Year 2014 with Development Traffic Forecast**

