

Northwest Territories
Highway Traffic, 2005



Northwest Territories Transportation

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Department of Transportation
Government of the Northwest Territories
June 2006

Acknowledgements

This report was prepared by the Planning and Policy Division of the Department of Transportation, Government of the Northwest Territories, in co-operation with: Highway Operations, Marine Services and Road Licensing & Safety Divisions.

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Table of Contents

Table of Contents	Page i
List of Figures	Page ii
List of Tables	Page iii
1.0 Summary of Traffic Data Collection Activities and Analysis	Page 1
1.1 Background	Page 1
1.2 Traffic Data Collection System	Page 1
1.3 Traffic Data Processing Procedures	Page 5
1.4 Glossary of Terms	Page 5
1.5 Layout of the Report	Page 6
2.0 Highway Traffic Volume Data	Page 7
3.0 Vehicle Movements at Ferries and Weigh Scales	Page 21
Appendix A Historical Data	
Appendix B Data Processing Methodology	

List of Figures

Figure 1	Northwest Territories Permanent and Seasonal Counter Locations (2005)	Page 2
Figure 2	2005 AADT at Permanent Counters	Page 7
Figure 3	2005 AADT on Highway Segments	Page 8
Figure 4	Estimated Vehicle Kilometres Travelled on Northwest Territories Highways	Page 16
Figure 5	Yearly Trend in Road Related Indicators	Page 17
Figure 6	Distribution of Monthly Traffic	Page 18
Figure 7	Distribution of Daily Traffic	Page 19
Figure 8	Distribution of Hourly Traffic	Page 20
Figure 9	Average Daily Traffic on Highway Ferries	Page 21
Figure 10	Commercial Vehicles Weighed at the Enterprise Weigh Scale	Page 29
Figure 11	Vehicle Classifications	Page 30

List of Tables

Table 1	Highway System Classification (2005)	Page 3
Table 2	Permanent and Seasonal Counter Locations	Page 4
Table 3	Estimated Traffic on Northwest Territories Highways	Page 9
Table 4	Traffic on Northwest Territories Access Roads (sorted by counter)	Page 10
Table 5	Traffic on Northwest Territories Winter Roads (sorted by counter)	Page 12
Table 6	Opening and Closing Dates for Winter Roads & Ice Bridges	Page 13
Table 7	Truck Traffic on the Tibbitt to Contwoyto Winter Road	Page 14
Table 8	Estimated Vehicle Kilometres Travelled on Northwest Territories Highways	Page 15
Table 9	Average Daily Traffic on Highway Ferries	Page 22
Table 10	Vehicle Classification Data at Dory Point Ferry (M.V. Merv Hardie)	Page 23
Table 11	Vehicle Classification Data at Liard River Ferry (M.V. Lafferty)	Page 24
Table 12	Vehicle Classification Data at Mackenzie River Ferry (M.V. Louis Cardinal)	Page 25
Table 13	Vehicle Classification Data at Peel River Ferry (C.F. Abraham Francis)	Page 26
Table 14	Vehicle Classification Data at Mackenzie River Ferry (M.V. Johnny Berens)	Page 27
Table 15	Vehicle Classification at the Enterprise Weigh Scale	Page 28

Section 1.0

Summary of Traffic Data Collection Activities and Analysis

1.0 Summary of Traffic Data Collection Activities and Analysis

1.1 Background

The Northwest Territories highway network consists of 2200 kilometres of all-weather roads and 1400 kilometres of winter roads. The highway system also includes five vehicle ferries. A map of the highway network is provided in Figure 1. A detailed listing of the highway system classification by surface type is provided in Table 1. It is noted that, in addition to the above, there are a number of winter roads constructed by mining companies to facilitate mine resupply.

The Department of Transportation of the Government of the Northwest Territories is responsible for operation and maintenance, capital rehabilitation, and upgrading of the Northwest Territories highway network. To monitor traffic utilizing the highway system, the Department of Transportation operates a series of mechanical counters and conducts periodic visual counts and surveys. Supplementing this information is data from the weigh scales and usage logs from the five ferries. Information obtained is used by the department to monitor changes in traffic flows, classify highways, set priorities in maintenance and capital funding, monitor safety aspects of the highways and optimize engineering designs. Traffic data is also used by businesses and the general public as the need arises.

This report presents traffic data collected by the Department of Transportation on the territorial highway network from 1993 to 2005. This report includes traffic information collected on major highways, access roads, winter roads and associated ferry crossings. The report also contains information on vehicle classifications.

1.2 Traffic Data Collection System

The Northwest Territories' Department of Transportation collects traffic at a number of permanent and seasonal counting stations as shown in Table 2 and illustrated in Figure 1. These stations provide hourly information on traffic for the complete year, or selected portions of the year for counters located on winter roads or other seasonal access roads. These stations are positioned to capture the general flow of traffic on the highway network.

Vehicle classification information is collected at the five ferries that operate on the highway system. The Marine Services Division of the Department of Transportation is responsible for collecting and processing this information.

Special turning movement counts at select intersections and visual vehicle classification counts are also conducted annually or as need arises. No manual counts were undertaken in 2005.

Information on truck volumes is obtained from the weigh scale in Enterprise. Truck volumes utilizing selected private (mining) winter roads is also collected and presented in this report.

In 2005, the Department initiated a two-year replacement program for traffic counters within the system. The 2005 report represents a significant improvement in traffic data reliability over previous years. The Department expects to have finished updating the traffic data network in 2006.

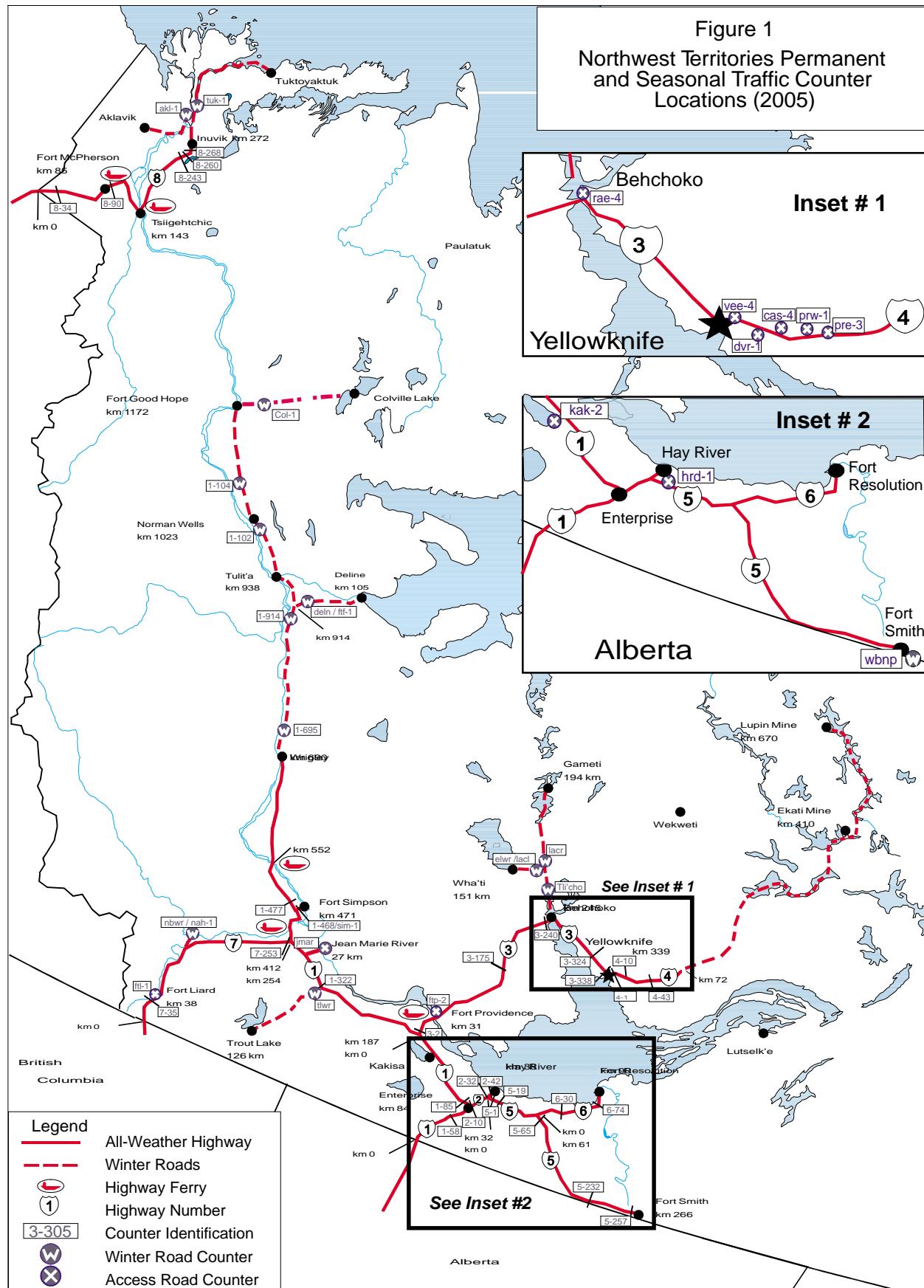


Table 1 Highway System Classification (2005)

Classification	Length (kilometres)						Total
	Paved	Dust- Controlled Gravel	Untreated Gravel	Ferry Crossing	Winter Road		
All-Weather Highways							
Highway 1 (Mackenzie Highway to Wrigley)	246.4	162.5	278.6	2.5	-	690.0	
Highway 2 (Hay River Highway)	43.7	-	-	-	-	43.7	
Highway 3 (Yellowknife Highway)	324.6	-	12.6	1.6	-	338.8	
Highway 4 (Ingraham Trail)	28.3	40.9	-	-	-	69.2	
Highway 5 (Fort Smith Highway)	157.5	108.5	-	-	-	266.0	
Highway 6 (Fort Resolution Highway)	38.0	24.0	28.0	-	-	90.0	
Highway 7 (Liard Highway)	-	73.2	180.9	-	-	254.1	
Highway 8 (Dempster Highway)	10.0	47.2	214.0	1.3	-	272.5	
Total	848.5	456.3	714.1	5.4	0.0	2,024.3	
Access Roads							
Kakisa Lake Access	12.9	-	-	-	-	12.9	
Fort Simpson Access	3.4	-	-	-	-	3.4	
Jean Marie River Access	-	-	27.4	-	-	27.4	
Fort Providence Access	5.4	-	-	-	-	5.4	
Rae Access	10.5	-	-	-	-	10.5	
Detah Access	11.3	-	-	-	-	11.3	
Hay River Reserve Access	2.4	11.8	-	-	-	14.2	
Fort Liard Access	1.3	-	4.0	-	-	5.3	
Hay River Hwy. No. 2 Km 43.7 - 48.6	4.9	-	-	-	-	4.9	
Yellowknife Access	1.7	-	-	-	-	1.7	
Fort McPherson Access	-	1.1	-	-	-	1.1	
Inuvik Access	0.6	-	-	-	-	0.6	
Hwy 3 Ice Crossing Access	-	9.4	-	-	-	9.4	
Miscellaneous Minor Access	3.2	8.5	45.2	-	-	56.9	
Total	57.6	30.8	76.6	0.0	0.0	165.0	
Winter Roads							
Mackenzie Valley Winter Road (Hwy #1- Wrigley to FGH)	-	-	-	-	486.4	486.4	
Colville Lake Winter Road (opened March 2001)	-	-	-	-	165.0	165.0	
Highway 3 Ice Crossing	-	-	-	-	3.1	3.1	
Trout Lake Winter Road	-	-	-	-	126.0	126.0	
Deline Winter Road	-	-	-	-	105.3	105.3	
Wha'ti Winter Road	-	-	-	-	103.0	103.0	
Rae Lakes Winter Road	-	-	-	-	125.0	125.0	
Nahanni Butte Winter Access Road	-	9.0	-	-	13.3	22.3	
Inuvik to Tuktoyaktuk Ice Road	-	-	-	-	184.0	184.0	
Aklavik Ice Road	-	-	-	-	85.0	85.0	
Detah Ice Road	-	-	-	-	6.3	6.3	
Total	0.0	9.0	0.0	0.0	1,402.4	1,411.4	
Total All-Weather Roads						2,189.3	
Total Winter Roads (Department of Transportation)						1,411.4	

Table 2 Permanent and Seasonal Counter Locations

Counter ID	Location (Hwy / Road)	Kilometre	Description
All-Weather Highways			
1-58	Highway 1	58	15 km south of Alexandra Falls
1-85	Highway 1	85	1.2 km west of Enterprise
1-322	Highway 1	322	0.4 km west of Trout Lake winter road
1-477	Highway 1	477	5.2 km west of Fort Simpson Access on Highway 1
2-10	Highway 2	10	10 km north of Enterprise, south of Paradise Gardens
2-32	Highway 2	32	40 metres north of Highway 2 and 5 intersection, south of service road
2-42	Highway 2	42	North of West Channel, across bridge
3-2	Highway 3	2	2 km north of Highway 1 and 3 intersection, south of ferry landing
3-175	Highway 3	175	53 km north of Chan Lake, 62 km south of Edzo
3-240	Highway 3	240	3 km south of Rae Access, north of Edzo
3-324	Highway 3	324	21 km east of Boundary Creek
3-338	Highway 3	338	0.8 km west of Highway 3 and 4 intersection
4-1	Highway 4	1	1 km north of Highway 3 and 4 intersection
4-10	Highway 4	10	2.5 km east of Yellowknife River Bridge / 300 m west of Dettah access road
4-43	Highway 4	43	11 km east of Prelude Lake East Access, 12 km west of Cameron River
5-1	Highway 5	1	1 km west of Highway 2 and 5, 1.5 km east of Hay River Reserve Access
5-19	Highway 5	19	10.6 km east of Sandy Creek, 19 km east of Highway 2 and 5 intersection
5-65	Highway 5	65	5 km south of Highway 5 and 6 intersection
5-232	Highway 5	232	12.3 km west of Salt River Village Access
5-257	Highway 5	257	6.1 km west of Fort Smith
6-30	Highway 6	30	8.5 km east of Pine Point Access
6-74	Highway 6	74	16 km west of Fort Resolution
7-35	Highway 7	35	2.6 km south of Fort Liard
7-253	Highway 7	253	0.3 km south of Highway 1 and 7 intersection
8-34	Highway 8	34	10 km west of Midway Lake
8-90	Highway 8	90	4.6 km north of Fort McPherson Access
8-243	Highway 8	243	1 km south of Cabin Creek
8-260	Highway 8	260	0.7 km north of airport access
8-268	Highway 8	268	1.3 km south of Inuvik
Access Roads			
cas-4	Cassidy Point	1	1 km north of junction with Highway 4
dvr-1	Dettah	1	1 km south of junction with Highway 4
ftl-1	Fort Liard	1	1 km west of junction with Highway 7
ftp-2	Fort Providence	2	2 km west of junction with Highway 3
hrd-1	Hay River Dene Reserve	1	1 km north of junction with Highway 5
jmar	Jean Marie River	1	1 km north of junction with Highway 1
kak-2	Kakisa	2	2 km south of junction with Highway 1
pre-3	Prelude East	1	1 km north of junction with Highway 4
prw-1	Prelude West	1	1 km north of junction with Highway 4
rae-4	Fort Rae	4.2	4.2 km north of junction with Highway 3
vee-4	Vee Lake	4.3	4 km north of junction with Highway 4
sim-1	Fort Simpson	1	1 km north of junction with Highway 1
Winter Roads			
1-695	Highway 1	695	1 km north of Wrigley on winter road
1-914	Highway 1	914	2 km south of junction of Highway 1 and Deline Access
1-102	Highway 1	1022	1.4 km south of Norman Wells
1-104	Highway 1	1031	0.5 km north of Norman Wells
akl-1	Aklavik	1	1 km west of junction with Tuktoyuktuk winter road
col-1	Colville Lake Winter Road	1	1 km east of junction with Mackenzie Valley winter road (Highway 1)
deln / ftf-1	Deline	1	1 km east of junction with Highway 1
elwr / lacl	Wha'ti	72	1 km west of junction with Gameti Access Road
lacr	Wha'ti / Rae Lakes	72	1 km north of junction with Wha'ti Access road
nbwr / nah-1	Nahanni Butte	2	2 km west of junction with Highway 7
tl'cho	Tli Cho Winter Road	1	1 km north of junction with Highway 3
tlwr	Trout Lake	1	1 km south of junction with Highway 1
tuk-1	Tuktoyaktuk	1	km 34 on Tuk winter road, 1 km north of junction with Aklavik winter road
wbnp	Wood Buffalo National Park		

1.3 Traffic Data Processing Procedures

The permanent traffic counters located throughout the Northwest Territories highway network collect traffic data on a continual basis. This data is stored to internal memory every hour. Approximately once per month, personnel working out of the highway maintenance camps download the data to a module, clear the internal memory of the counter, and send the downloaded data to the Transportation Planning and Policy Division.

Personnel with the Transportation Planning and Policy Division download the data from the module to the Government network in a flat file (ASCII format) and conduct a first level screening of the data. Any problems are noted and corrupt data is disregarded. The data is then copied into a Microsoft Excel spreadsheet and analysed to obtain the information presented in this report.

The first step in the analysis of the traffic data is to check for completeness and accuracy. Common problems include missing data due to the counter or module not functioning correctly, overlapping or missing data between months, and counts too high or low due to counter malfunctions. To ensure accurate results and also provide as much information as possible, a series of procedures has been established to correct deficiencies in the data. These steps are outlined in Appendix B.

1.4 Glossary of Terms

Average Annual Daily Traffic (AADT) is an estimate of the mean daily traffic for a period of one year.

Average Daily Traffic (ADT) is an estimate of the mean traffic for a specified period of time. For example, monthly ADT is an estimate of the mean daily traffic for a specified month.

Growth Rate is the increase or decrease in AADT from year to year.

Near Urban Highway is a section of highway located within or near a major urban centre.

Peak Summer Average Daily Traffic (PSADT) is an estimate of the mean daily traffic for the months of June, July and August.

Permanent Traffic Counter is a counter that is permanently placed at a specific location and counts traffic continuously.

Rural Highway is a section of highway located away from the traffic influence of a major urban centre.

Short Term Counts provide measurements of traffic characteristics based on visual observation for a specified period of time and purpose.

Traffic distributions illustrate how traffic varies over time. Distributions may be by month, by day of the week or hourly, and is usually measured as a percent of the AADT.

Vehicle Classification is the distribution of vehicle types in a traffic stream.

Vehicle Kilometres Travelled is the total number of vehicles for a specific road segment multiplied by the length of the road segment. Typically this result is multiplied by 365 days to reflect kilometres travelled in a year.

1.5 Layout of the Report

This report is organized into four sections.

Section 1 provides an introduction to the Northwest Territories traffic data collection system.

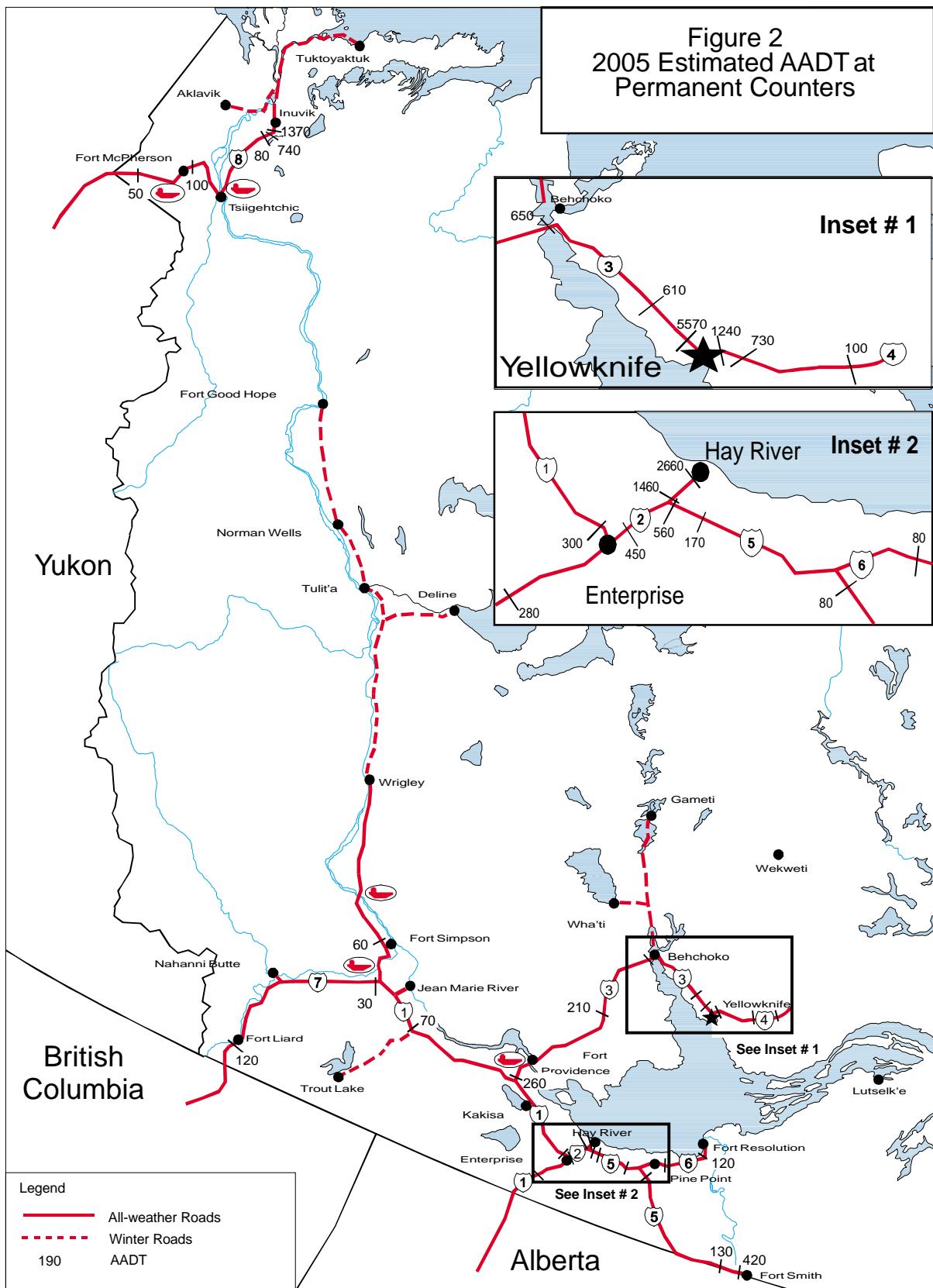
Section 2 presents the traffic information collected at all permanent counter locations and selected mining roads; including traffic volumes, distributions and vehicle kilometres travelled.

Section 3 presents traffic information collected on highway ferries, and commercial vehicle activity from the weigh scales.

The Appendices present additional detailed traffic information.

Section 2.0

Highway Traffic Volume Data



Note: Some data in this figure has been estimated using information from past years.

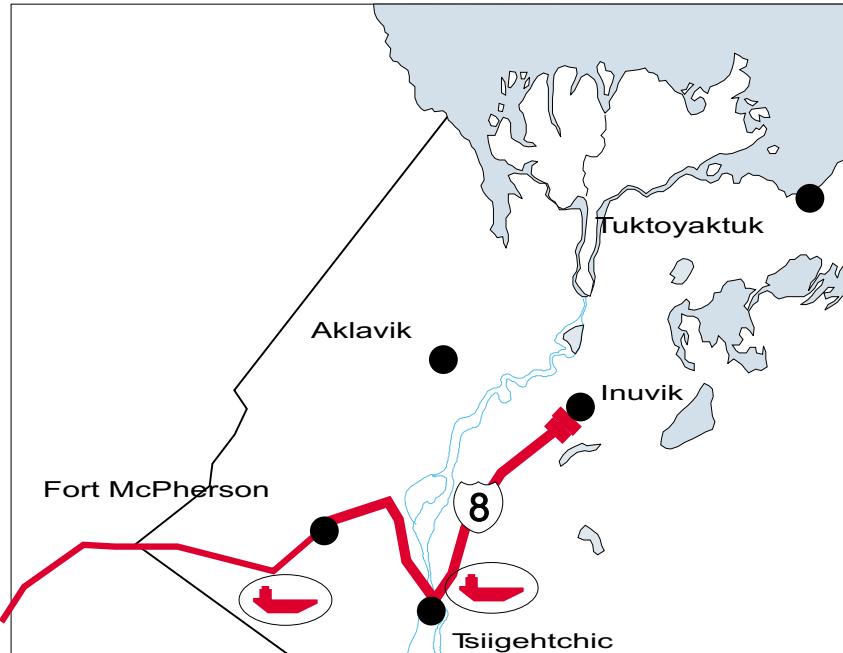


Figure 3
2005 AADT on
Highway Segments

Line Thickness	AADT
Thinnest	0-49
Very thin	50-99
Thin	100-199
Medium thin	200-299
Medium	300-399
Medium thick	400-499
Thick	500-999
Thickest	1000+

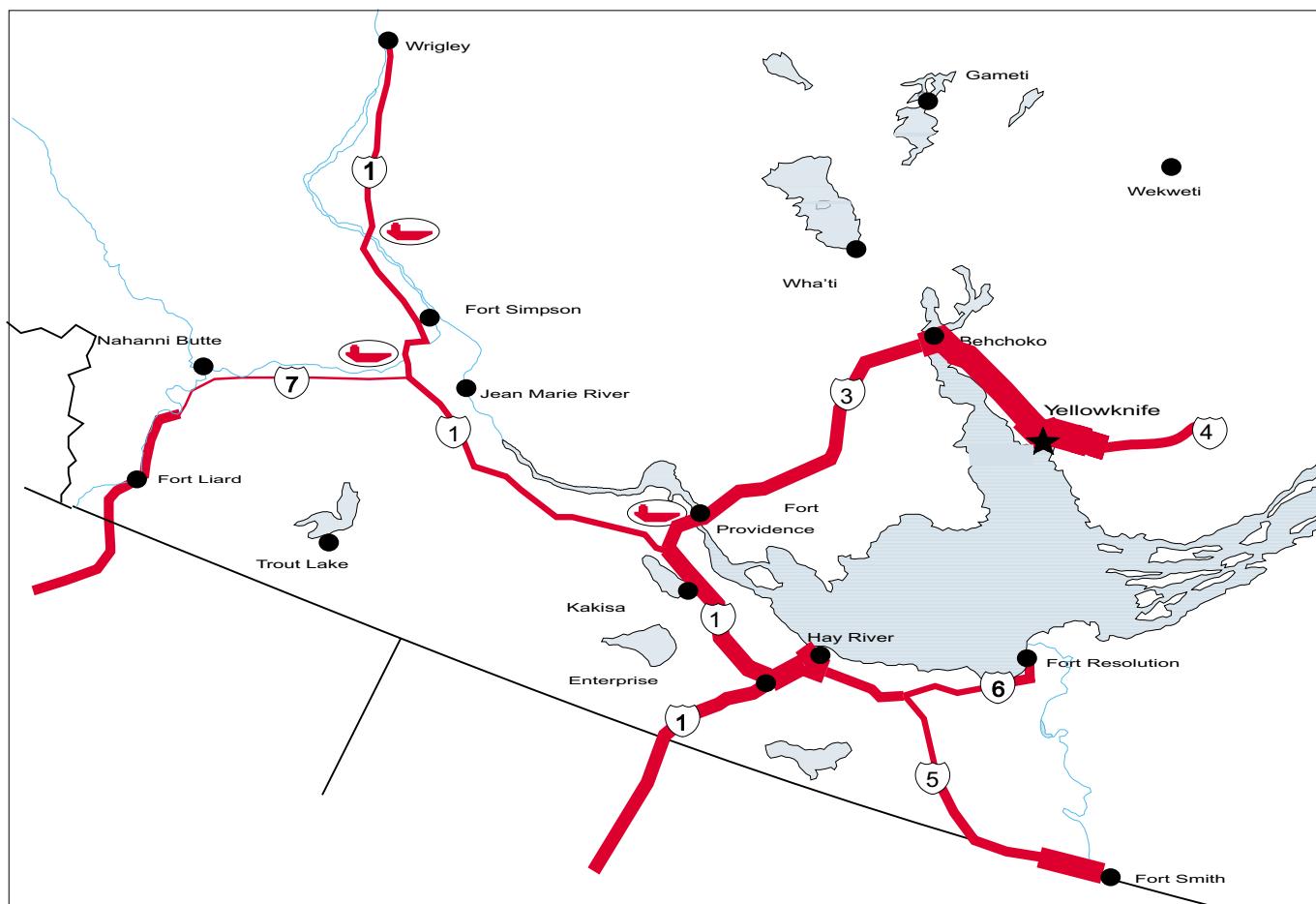


Table 3 Estimated Traffic on Northwest Territories Highways

Highway	Kilometre	Counter ID	Description	AADT				PSADT											
				2005	2004	2003	2002	2001	2000	1999	1998	2005	2004	2003	2002	2001	2000	1999	1998
Data Not Available																			
1	58	1-58	15 km south of Alexandra Falls	280	250	250	240	230	220	210	200	390	420	390	350	340	320	320	320
1	85	1-85	1.2 km west of Enterprise	300	270	270	250	240	230	230	230	380	400	320	320	320	320	320	330
1	322	1-322	0.4 km west of Trout Lake winter road	70	60	60	60	60	60	**	50	90	80	80	80	**	80	**	80
1	477	1477	5.2 km west of Fort Simpson Access on Highway 1	60	50	50	40	40	**	40	60	60	60	60	60	60	60	60	50
2	10	2-10	10 km north of Enterprise, south of Paradise Gardens	450	410	420	400	400	400	410	410	550	510	530	500	500	510	510	520
2	32	2-32	40 metres north of Highway 2 and 5 intersection	1460	1390	1420	1340	1340	1340	1340	1340	1920	1970	1880	1880	1880	1880	1880	1760
2	42	2-42	North of West Channel across bridge	2860	2530	2590	2440	2420	2400	2450	2450	3130	3120	3200	3010	3010	3000	3000	3050
3	2	3-2	2 km north of Highway 1 and 3 intersection, south of ferry	260	250	240	220	200	190	200	200	350	350	330	290	290	280	280	280
3	175	3-175	53 km north of Chan Lake, 62 km south of Edzo	210	210	210	190	180	180	180	180	290	290	280	270	270	260	260	**
3	240	3-240	3 km south of Rae access, south of Frank's Channel	650	650	640	590	570	550	560	560	710	710	700	670	670	650	650	**
3 ¹	324	3-324	0.1 km west of km 324 marker	610	450	440	410	400	390	390	690	520	500	470	460	470	470	470	430
3	338	3-338	0.8 km west of Highway 3 and 4 intersection	5570	5570	5460	5060	4980	5010	4890	6460	6460	6330	6030	6030	6180	6180	5740	5740
4	1	4-1	1 km north of Highway 3 and 4 intersection	1240	1240	1240	1230	1330	1460	1600	1600	1600	1600	1600	1600	1600	1600	1600	1850
4	10	4-10	2.5 km east of Yellowknife River Bridge	730	730	730	720	720	**	**	950	950	950	950	950	950	950	950	**
4	43	4-43	11 km east of Prelude Lake East Access	100	100	100	100	100	**	100	130	130	130	130	130	140	140	140	130
5	1	5-1	1 km east of Highway 2 and 5 intersection	560	560	530	520	510	520	520	740	740	710	690	690	700	700	730	730
5	19	5-19	19 km east of Highway 2 and 5 intersection	170	170	160	160	170	170	170	230	230	220	220	220	210	210	220	220
5	65	5-65	5 km south of Highway 5 and 6 intersection	80	80	70	70	70	70	70	100	100	100	100	100	110	110	110	90
5	232	5-232	25km west of Fort Smith	130	130	120	120	120	120	120	200	200	190	180	180	180	180	180	140
5	257	5-257	6.1 km west of Fort Smith	420	420	390	390	390	390	380	530	530	510	500	480	480	480	480	460
6	30	6-30	8.5 km east of Pine Point Access	80	80	80	80	80	80	80	90	100	110	100	100	100	100	100	90
6	74	6-74	16 km west of Fort Resolution	120	110	100	110	100	100	110	130	140	140	130	130	120	120	120	140
7	35	7-35	2.6 km south of Fort Liard	120	120	120	**	**	120	130	130	130	130	130	130	130	130	130	130
7	253	7-253	0.3 km south of Highway 1 and 7 intersection	30	30	30	30	30	30	30	40	40	40	40	40	50	50	50	50
8	34	8-34	10 km west of Midway Lake	50	50	50	40	40	40	40	90	100	100	90	90	100	100	100	90
8	90	8-90	4.6 km north of Fort Mcpherson Access	100	80	80	80	80	80	90	140	180	170	150	160	180	180	170	170
8	243	8-243	1 km south of Cabin Creek	80	80	80	70	80	80	80	130	130	130	120	120	130	130	130	130
8	260	8-260	0.7 km north of airport access	740	740	690	630	630	630	760	900	830	850	850	950	950	880	880	880
8	268	8-268	1.3 km south of Inuvik	1370	1270	1210	1120	1120	1120	1150	1400	1300	1640	1510	1500	1650	1650	1560	1560

¹ Counter was moved to km 324 in October 2005 due to reconstruction. It was previously located at km 305.

** Insufficient data to calculate AADT/PSADT

AADT - Average Annual Daily Traffic

PSADT - Peak Summer Average Daily Traffic (June, July, August)

All values are estimated and rounded to the nearest 10.

Table 4 Traffic on Northwest Territories Access Roads (sorted by counter)

Community	Location (km)	Counter ID	Year	Monthly Average Daily Traffic												PSADT	
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Kakisa	2	kak-2	2000	24	43	52	74	86	50			33	36	47			
			1999	27	27	38	60	89	53			52	38	27	25	25	
			1998				28	64	77	101	80	55	32	29	23	86	
			1997	23	21	21			94	79	90	37	15	21	20	89	
			1996	18	23	25	23	49	84	109	90	43	31	24	24	95	
			1995	26			24		77	109	76	54	31	23	24	87	
			1994	15	19	17		49	68	109	87	48	37		24	89	
			1993	16		20	21	46	61	81	94	44	29	20	20	79	
Rae	4.2	rae-4	2004		693	667											
			1998					433									
			1997							543	593	542	568			589	
			1996		283				580		686	673	582	373		686	
			1995						553	614	621	644	581	389		588	
			1994			194				550		467	298				
			1993	584	237											506	
Dettah	1	dvr-1	2001	56	161			283	284	256	216					274	
			2000	48	34	54	95	261	310	211	278	290	277	235		266	
			1999		44	53	292	277		245	270	289	293	246		266	
			1998	73	65	57	31	121	156	134				259	212	139	
			1997						126	98	241	252	186		127		
			1996						237	211	252	258	262			231	
			1995	48	42	44	118		260	215	212	250	240	217		227	
			1994			52	130		269	228		252	248	228	125	254	
			1993	48	43	55	212	223	210	198	190	211	222	248		199	
Paradise Gardens	2	pgr-1	1996	78	90	93	109	111	157	160	172	141	122	103	99	163	
			1995							143	134	109	94	78		143	
			1994	69	65	68	96	110	138	128	140	123				135	
			1993						114	97	109	103	87	76	73	107	
Vee Lake	4.3	vee-4	2005		75	65	58	72	68	59	45	35	20			66	
			2004	40	61	55		59								57	
			2002	56					60	75	44					60	
			2001														
			2000														
			1999	43	82	70	58	39									
			1998	63	71	70	58	79	77	77	59	49	35	37	20	70	
			1997						86	65	63	41	33			71	
			1996						100	67	58	37	25	38		69	
			1995						71	51	52	26	41			61	
			1994						90	84	56	47	33			76	
			1993						76	85	72	59	46	32	28	73	
Cassidy Point	4	cas-4	1998							96	54	46	35			97	
			1997						57	50	36	36				55	
			1996						123	94	75	49	43			109	
			1995									46	34				
			1994		75	88	177	84	96	102	82	67	53			93	
			1993						90	100	80	64	50	44		97	
Prelude Lake West	1	prw-1	1998							193	238	139	78	57			238
			1997						290	290	253	141	64			280	
			1996						331	256	243	127	90	101			264
			1995													305	
			1994							239		117	85	63			232
Prelude Lake East	3	pre-3	2000						306								306
			1999					283	307	261						284	
			1998							5	88	83	74	59			86
			1997						116	83	76	62	58				86
			1996							68	65	48	29				68
			1995							85	71	64	54				76
			1994						93	91	86	82	72				88
Hay River Dene Village	1	hrd-1	2005		86	83	178	479			546	378					
			2004	84	80	73										455	
			2001		36	404		287		623	469	121	441				427
			2000	14	37	52	304	416	453	400	421	469					405
			1999	32	37	126	357		356	399	425	167					
			1998	62	40	48	267										
			1997	29	33	42			395	362							
			1996	31	54	71	354	446	480	383	416	373	390	255	33	426	
			1995	29	33	41	216	451	391	420	407	414	170	43		420	
			1994	26	31	75	302							46	39		
			1993	28	27	137	376		411	356	365	333	344	234	50		

Table 4 cont'd Traffic on Northwest Territories Access Roads (sorted by counter)

Community	Location (km)	Counter ID	Year	Monthly Average Daily Traffic												PSADT
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Fort Providence	2	ftp-2	2005	362	464	133	43	415	387	333		201	180			378
			2004	255	298											472
			2003	260	269	264		396	353	515	551					457
			2002	277	243	248				457	375	334	279	289		347
			2001			208		324	352	365	336	207				201
			2000	315	421	270	219	299	259	254	210	194	200	139	119	241
			1999	316	423	259	309	662	239	205	176	170	154	149		468
			1998	249	276	271	397	315				309	328	254	49	
			1997			213		465	439	488	337	271				446
			1996	211	227	242	297	360	421	419	501	397	307	331	247	219
			1995	200	228	226	273	357	368	426	477	303	262	244		254
			1994	197	192	246	281	381	449	512	383	315	243	222	230	232
			1993	183	99	188	334	404	444	531	456	295	275	233	227	202
Fort Liard	1	fl-1	1998		242	175	207	332	405	326	249					355
			1997	166	218	211	238				132	89				
			1996		195	210			252	197	193	156		142		219
			1995	172	366	339	213	220	209	255	297	220	172	135	134	254
			1994	150	161	197	169	206		231	190	199	162	172		232
			1993	155	165	166	170	180	204	211	193	180	171	162	146	202
Fort Simpson	1	sim-1	2005							1292	1493	1313	1202	1107	1041	1393
			2003		1289	1302						269	354			911
			2001			430										
			2000	961	991	1093	1110			911						
			1999	960	989	1076	1114	891				1235	1128	976	1007	
			1998									1208	978			1176
			1997	478	895	866			1100	1215	1143		1054	867	773	
			1996													
Jean Marie River	1	jmar	2005							24	23	33	23			24
			2003			34	36					19	27	81		
			2001													24
			2000				16	22	30	23	17					
			1999													
			1998	12	18	18	14	14	62		89	70	49			84
			1997	14	13									17		

Note: Blanks indicate insufficient data to calculate monthly ADT.

Table 5 Traffic on Northwest Territories Winter Roads (sorted by road)

Winter Road	Location (km)	Counter ID	Year	Opening Date	Closing Date	Monthly Average Daily Traffic					ADT
						Dec	Jan	Feb	March	April	
Aklavik	1	akl-1	1996	Dec 19 / 95	Apr 26 / 96	32	49	43			41
			1995	Dec 23 / 94	Apr 24 / 95						
			1994	Jan 18 / 94	Apr 28 / 94						
			1993	Dec 15 / 92	May 2 / 93	53	61	70	32		54
Colville Lake	1	col-1	2006	Jan 13 / 06	Mar 22 / 06	4	14	17			14
			2005	Dec 13 / 04	Mar 31 / 05		54	54			54
Deline / Fort Franklin	1	deln	2006	Jan 25 / 06	Mar 22 / 06	54	49	39			45
			1998	Feb 3 / 98	Mar 16 / 98	13	15				15
			1997	Feb 4 / 97	Mar 17 / 97	110	73	46			76
			1996	Jan 18 / 96	Mar 20 / 96						
	1	fft-1	1995	Jan 20 / 95	Mar 26 / 95	42	39	35			37
			1994	Jan 25 / 94	Mar 30 / 94	42	19	30			30
			1993			16	23	35	21		23
Detah Ice Road	at entrance (Yellowknife Side)	dettah	2006	Dec 20 / 05	Apr 16 / 06	686	644	712	814	764	726
			2005	Dec 10 / 04	Apr 11 / 05	652	624	829	973		791
Gameti	72	lacr	1997	Feb 7 / 97	Mar 25 / 97	78	170	152			133
			1996	Feb 2 / 96	Mar 20 / 96						
			1995	Jan 13 / 95	Mar 22 / 95						
Highway No. 1	695	1-695	2006	Dec 19 / 05	Apr 7 / 06	53	74	85			76
			2005	Dec 13 / 04	Mar 31 / 05	39	49	51			49
Highway No. 1	914	1-914	2006	Dec 19 / 05	Apr 7 / 06	44	50	45			47
			2005	Jan 04 / 05	Mar 31 / 05	21	70	64			63
			1998	Feb 6 / 98	Mar 16 / 98	10	7				8
			1997	Feb 14 / 97	Mar 17 / 97		7	34	17		19
			1996	Jan 26 / 96	Mar 20 / 96						
			1995	Jan 12 / 95	Mar 19 / 95	29	35				32
			1994	Dec 23 / 93	Mar 29 / 94	12	20	23			19
			1993	Jan 11 / 93	Mar 26 / 93	27	27				27
Highway No. 1	1022	1-102	2006	Dec 19 / 05	Apr 7 / 06	98	68	77			74
			2005	Jan 04 / 05	Mar 31 / 05	51	70	86			80
			1999	Dec 31 / 98	Mar 16 / 99	33					33
			1998	Jan 23 / 98	Mar 16 / 98	107	139				112
			1997	Jan 14 / 97	Mar 17 / 97	9	10				10
			1996	Jan 8 / 96	Mar 20 / 96						
			1995	Jan 18 / 95	Mar 26 / 95						
			1994	Dec 29 / 93	Mar 30 / 94	40	49	55			48
Highway No. 1	1031	1-104	1993	Jan 14 / 93	Mar 29 / 93	16	19	18	4		14
						19	20	24			21
Nahanni Butte	2	nbwr	1997	Dec 9 / 96	Apr 17 / 97	23	40	69	13		36
			1996	Dec 1 / 95	Mar 25 / 96	11	10	19			13
			1995	Dec 01 / 94	Mar 26 / 95	10	17	39			22
			1994	Dec 18 / 93	Mar 28 / 94	20	18				19
			1993	Dec 15 / 92	Mar 27 / 93	13	12				12
Tibbitt to Contwoyto	0.3	lupin	2006	Feb 1 / 06	Mar 23 / 06		167	243			201
Tli'Cho	0.1	tlcho	2006	Feb 7 / 06	Apr 16 / 06		71	77			74
Trout Lake	1	tlwr	2002	Jan 14 / 02	Mar 18 / 02	6	7				7
			2001	Dec 18 / 00	Mar 15 / 01						
			2000	Jan 11 / 00	Mar 15 / 00						
			1999	Dec 21 / 98	Mar 16 / 99	9	7	9			8
			1998	Jan 20 / 98	Mar 16 / 98		5				5
			1997	Jan 11 / 97	Mar 17 / 97		5	9			7
			1996	Jan 20 / 96	Mar 15 / 96	4	6	11	9		8
			1995	Dec 22 / 94	Mar 22 / 95	8					8
Tuktoyaktuk	1	tuk-1	1997	Dec 20 / 96	Apr 25 / 97	30	44	61			45
			1996	Dec 19 / 95	Apr 19 / 96		74				
			1995	Dec 22 / 94	Apr 24 / 95						
			1994	Jan 05 / 94	Apr 28 / 94						
			1993	Dec 18 / 92	May 2 / 93	32	83	108	101		81
Wha'ti	72	elwr	1997	Jan 20 / 97	Mar 25 / 97	31	45	64			47
			1996	Jan 15 / 96	Mar 20 / 96		16	20	20	8	
			1995	Jan 13 / 95	Mar 29 / 95		17	17	15		
			1994	Feb 18 / 94	Apr 18 / 94						
			1993	Jan 27 / 93	April 2 / 93		16	14			15
Wood Buffalo National Park		wbnp	2004			29	25				27
			2000			7	15	17			13
			1997			16	20	20	8		16
			1996			22	18	20	24		21
			1995			17	17	15			16
			1994			13	3				8
			1993			16	17	14			16

Note: Blanks may indicate insufficient data to calculate monthly ADT, road closed, or counter not installed.

Table 6 Opening and Close Dates for Winter Roads & Ice Bridges

ALL WEATHER ROAD OPENED SUMMER 1994												ALL WEATHER ROAD OPENED FALL 1997												
Winter Roads	7-Highway - Wrigley	7-Highway #1 - Tuilla - Nomwan Wells	7-Highway - Tuilla (Highway #1)	Hope (Highway #1)	Colville Highway #1	Delhi Lake Access	Troll Lake Bridge Access	Nahan-Maree Bridge Access	Leahni-Buite Access	Wrae TI Access	Thukayakuk Access	Land River Crossing	MacKenzie River Crossing at Tsiigiehchic	Pel River Crossing	MacKenzie River Crossing at Kamseel Bead	Lupin Mine	Minning Roads							
1993/94	Open	12-Jan	13-Jan	13-Jan	13-Jan	16-Jan	6-Dec	4-Jan	16-Jan	13-Dec	16-Jan	22-Dec	Open	16-Dec	3-Dec	18-Nov	10-Nov	12-Jan	Open	17-Feb	1-Apr	14-Jan	3-Apr	
Closed	Closed	13-Apr	4-Apr	4-Apr	4-Apr	31-Mar	31-Mar	31-Mar	31-Mar	14-Jan	20-Nov	11-Dec	Closed	20-Apr	8-May	8-May	8-May	13-Apr	Closed	13-Apr	14-Jan	3-Apr	3-Apr	
1994/95	Open	27-Dec	15-Jan	15-Jan	15-Jan	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	24-Dec	Open	13-Dec	19-Nov	15-Nov	17-Dec	Open	27-Dec	30-Jan	30-Jan	30-Jan	30-Jan	
Closed	Closed	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	20-Mar	24-Dec	Closed	22-Apr	2-May	11-May	11-May	20-Mar	Closed	20-Mar	20-Mar	20-Mar	20-Mar	
1995/96	Open	18-Dec	25-Jan	23-Dec	15-Jan	17-Jan	6-Nov	18-Dec	11-Jan	28-Nov	12-Dec	12-Dec	Open	13-Dec	14-Nov	14-Nov	6-Nov	18-Dec	Open	22-Jan	27-Apr	27-Apr	27-Apr	
Closed	Closed	3-Apr	3-Apr	3-Apr	3-Apr	3-Apr	3-Apr	3-Apr	3-Apr	3-Apr	3-Apr	28-Apr	Closed	15-Apr	26-Apr	9-May	10-May	3-Apr	Closed	7-Apr	14-Jan	14-Jan	14-Jan	
1996/97	Open	17-Dec	13-Jan	19-Jan	9-Jan	9-Jan	15-Dec	18-Dec	18-Dec	20-Dec	20-Dec	20-Dec	Open	17-Dec	21-Nov	19-Nov	19-Nov	17-Dec	Open	22-Jan	27-Apr	27-Apr	27-Apr	
Closed	Closed	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	Closed	19-Apr	21-Apr	19-Apr	19-Apr	1-Apr	Closed	1-Apr	14-Jan	14-Jan	14-Jan	
1997/98	Open	19-Dec	19-Dec	29-Dec	13-Jan	13-Jan	13-Jan	13-Jan	13-Jan	13-Jan	13-Jan	13-Jan	Open	19-Dec	21-Nov	21-Nov	21-Nov	17-Dec	Open	28-Jan	30-Apr	30-Apr	30-Apr	
Closed	Closed	7-Apr	7-Apr	7-Apr	7-Apr	7-Apr	7-Apr	7-Apr	7-Apr	7-Apr	7-Apr	7-Apr	Closed	19-Apr	21-Apr	17-Apr	17-Apr	7-Apr	Closed	7-Apr	14-Jan	14-Jan	14-Jan	
1998/99	Open	1-Feb	31-Dec	7-Jan	7-Jan	21-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	Open	31-Dec	16-Dec	16-Dec	16-Dec	1-Dec	Open	23-Nov	20-Apr	20-Apr	20-Apr	
Closed	Closed	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	Closed	16-Apr	9-Apr	9-Apr	9-Apr	16-Mar	Closed	16-Mar	16-Mar	16-Mar	16-Mar	
1999/00	Open	3-Feb	11-Jan	24-Dec	11-Jan	13-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	Open	1-Feb	14-Feb	11-Jan	14-Dec	17-Jan	Open	6-Jan	3-Dec	1-Dec	1-Dec	
Closed	Closed	15-Mar	15-Mar	15-Mar	15-Mar	15-Mar	15-Mar	15-Mar	15-Mar	15-Mar	15-Mar	15-Mar	Closed	20-Apr	12-Apr	12-Apr	12-Apr	5-May	Closed	22-Apr	3-Apr	3-Apr	3-Apr	
2000/01	Open	19-Jan	15-Jan	8-Jan	23-Feb	20-Jan	18-Dec	6-Dec	18-Mar	20-Feb	10-Mar	21-Dec	Open	14-Apr	14-Apr	14-Apr	14-Apr	21-Apr	Open	21-Apr	14-Dec	14-Dec	14-Dec	
Closed	Closed	15-Mar	5-Apr	5-Apr	5-Apr	5-Apr	5-Apr	5-Apr	5-Apr	5-Apr	5-Apr	5-Apr	Closed	24-Jan	11-Jan	9-Jan	8-May	31-Dec	Closed	15-Apr	21-Apr	21-Apr	21-Apr	
2001/02	Open	20-Dec	10-Jan	11-Jan	9-Jan	18-Mar	14-Jan	14-Jan	14-Jan	24-Jan	11-Feb	21-Dec	2-Dec	31-Dec	31-Dec	31-Dec	31-Dec	2-Dec	Open	24-Jan	2-Dec	14-Dec	14-Dec	
Closed	Closed	18-Mar	18-Mar	18-Mar	18-Mar	18-Mar	18-Mar	18-Mar	18-Mar	18-Mar	18-Mar	18-Mar	Closed	25-Apr	25-Apr	25-Apr	25-Apr	2-May	Closed	2-May	9-May	14-Dec	14-Dec	
2002/03	Open	22-Jan	22-Jan	20-Jan	20-Jan	17-Mar	9-Jan	9-Jan	9-Jan	27-Jan	10-Feb	6-Dec	6-Dec	17-Jan	17-Jan	17-Jan	17-Jan	21-Nov	Open	19-Dec	1-Dec	1-Dec	1-Dec	
Closed	Closed	18-Mar	10-Apr	10-Apr	10-Apr	10-Apr	10-Apr	10-Apr	10-Apr	10-Apr	10-Apr	10-Apr	Closed	17-Apr	18-Apr	18-Apr	18-Apr	19-Apr	Closed	19-Apr	13-Mar	13-Mar	13-Mar	
2003/04	Open	19-Dec	29-Dec	19-Dec	19-Dec	13-Jan	12-Dec	16-Dec	13-Feb	9-Mar	19-Dec	17-Dec	23-Dec	Open	16-Mar	26-Nov	20-Nov	14-Nov	1-Dec	Open	28-Jan	1-Dec	1-Dec	1-Dec
Closed	Closed	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	16-Mar	Closed	22-Apr	22-Apr	22-Apr	22-Apr	22-Apr	Closed	22-Apr	14-Jan	14-Jan	14-Jan	
2004/05	Open	13-Dec	4-Jan	1-Apr	1-Apr	1-Apr	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	Open	14-Jan	10-Dec	7-Dec	6-Dec	1-Dec	Open	31-Oct	1-Dec	1-Dec	1-Dec	
Closed	Closed	19-Dec	19-Dec	29-Dec	13-Jan	25-Jan	22-Dec	8-Dec	7-Feb	16-Mar	20-Dec	9-Jan	13-Jan	Open	19-Apr	27-Apr	25-Apr	18-Apr	22-Apr	Open	22-Jan	5-Apr	5-Apr	5-Apr
2005/06	Open	7-Apr	7-Apr	7-Apr	7-Apr	22-Mar	22-Mar	22-Mar	22-Mar	22-Mar	22-Mar	22-Mar	Open	16-Apr	16-Apr	16-Apr	16-Apr	9-May	Open	17-Jan	1-Dec	1-Dec	1-Dec	

Last 20 years average

Open	11-Jan	7-Jan	23-Mar	28-Mar	23-Jan	2-Jan	24-Mar	7-Apr	24-Jan	9-Feb	14-Dec	26-Dec	4-Jan	Open	22-Dec	25-Nov	25-Nov	15-Nov	16-Dec	Open	29-Jan	3-Apr	
Closed	Closed	23-Mar	29-Mar	1-Apr	29-Mar	24-Mar	24-Mar	30-Apr	19-Apr	19-Apr	19-Apr	19-Apr	19-Apr	Closed	30-Apr	30-Apr	30-Apr	30-Apr	5-May	Closed	30-Apr	4-Apr	4-Apr

Last 5 years average

Table 7 Truck Traffic on the Tibbitt to Contwoyo Winter Road

		Lupin Mine ⁽¹⁾	BHP Diamonds Ekati Mine	Diavik Diamond Mines Inc.	DeBeers Snap Lake	Tahera	Mineral Exploration Traffic	Total
2006 ⁽²⁾	Total Tonnage	1,071	82,447	55,750	34,852	7,821	2,435	184,376
	Total Trucks	35	3,152	2,094	1,623	258	148	7,310
2005	Total Tonnage	7,709	117,661	94,303	18,089		14,771	252,533
	Total Trucks	251	3,434	2,848	703		614	7,850
2004	Total Tonnage	11,097	105,127	53,960	6,852		2,108	179,144
	Total Trucks	288	2,984	1,572	295		117	5,256
2003	Total Tonnage	27,832	101,990	67,394			1,602	198,818
	Total Trucks	702	3,003	2,202			87	5,994
2002	Total Tonnage	27,315	132,077	93,009			3,083	255,484
	Total Trucks	698	3,913	3,339			218	8,168
2001	Total Tonnage	26,239	99,297	111,506			8,545	245,587
	Total Trucks	688	2,912	4,127			363	8,090
2000	Total Tonnage	21,672	66,609	25,068			12,031	125,380
	Total Trucks	557			3,402			3,959
1999	Total Tonnage	3,356	41,453				12,399	57,208
	Total Trucks	85			1,759			1,844
1998 ⁽³⁾	Total Tonnage	4,220	73,712				4,056	81,988
	Total Trucks	112			2,431			2,543

The number of trucks indicated are "loaded truckloads" and therefore represents one-way traffic. To determine the total truck traffic these numbers should be multiplied by 2.

(1) Winter road data provided by the Tibbitt to Contwoyo Winter Road Joint Venture.

Road is typically open during most of January to March.

2006 season	50 days (February 5 - March 26)
2005 season	70 days (January 26 - April 5)
2004 season	64 days (January 28 - March 31)
2003 season	61 days (February 1 - April 2)
2002 season	81 days (January 26 - April 16)
2001 season	72 days (February 1 - April 13)
2000 season	65 days (January 29 - April 3)
1999 season	58 days (February 1 - March 30)
1998 season	76 days (January 19 - April 4)

Notes: BHP Diamond Mines Ekati Mine went into production in October of 1998. Diavik Diamond Mine began construction of the mine site in 2000.

(2) Climatically, 2006 was one of the warmest winters on record.

Winter road never reached full load bearing capacity.

(3) For data preceding 1998, please see Appendix B "Historical Data"

Table 8 Estimated Vehicle Kilometres Travelled on NWT Highway s

Hwy km	Length (km)	AADT										Vehicle Kilometres Travelled (millions)							
		2005	2004	2003	2002	2001	2000	1999	1998	2005	2004	2003	2002	2001	2000	1999	1998		
1 58 Alberta Border to Enterprise	84.2	280		250	250	240	230	220	210	8.7		7.6	7.8	7.4	7.1	6.7	6.6		
1 85 Enterprise to Junction with Hwy #3	103.4	300		270	270	250	240	230	230	11.4		10.3	10.1	9.4	9.2	8.6	8.8		
1 Arterial	187.6									20.1		17.9	17.9	16.8	16.2	15.3	15.4		
2 10 Enterprise to Junction with Hwy #5	37.5	450		410	420	400	400	400	410	6.1		5.6	5.8	5.5	5.4	5.5	5.6		
2 32 Junction with Hwy #5 to Hay River (West Channel Bridge)	6.2	1460		1390	1420	1340	1340	1340	1340	3.3		3.1	3.2	3.0	3.0	3.0	3.0		
2 Arterial	43.7									9.4		8.7	9.0	8.5	8.5	8.5	8.7		
3 2 Junction with Hwy #1 to Fort Providence Access	44.1	260		250	240	220	200	190	200	4.2		4.0	3.9	3.5	3.2	3.0	3.2		
3 175 Fort Providence Access to Edzo Access	192.4	210		210	210	190	180	180	180	14.8		14.8	14.5	13.5	12.9	12.9	12.9		
3 240 Edzo Access to Rae Access	8.5	650		650	640	590	570	550	560	2.0		2.0	2.0	1.8	1.8	1.7	1.7		
*3 305 Rae Access to Yellowknife Access (Old Airport Road)	88.5	450		450	440	410	400	390	390	14.6		14.6	14.3	13.1	12.9	12.7	12.7		
3 340 Old Airport Road Junction to Junction with Hwy #4	5.3	5570		5570	5460	5060	4980	5010	4890	10.8		10.8	10.6	9.8	9.6	9.7	9.5		
3 Arterial	338.8									46.4		46.1	45.2	41.7	40.3	40.1	39.9		
Total Arterial		<u>570.1</u>								<u>75.9</u>		<u>72.8</u>	<u>72.1</u>	<u>67.0</u>	<u>65.0</u>	<u>63.9</u>	<u>64.0</u>		
1 322 Junction with Hwy #3 to Junction with Hwy #7	268.8	70		60	60	60	60	50	50	7.2		6.1	6.3	6.1	5.6	5.0	5.0		
*1 468 Junction with Hwy #7 to Fort Simpson Access	14.9	240		240	240	240	240	240	240	1.3		1.3	1.3	1.3	1.3	1.3	1.3		
1 477 Fort Simpson Access to Mackenzie River	79.2	60		40	50	40	40	40	40	1.6		1.2	1.5	1.2	1.2	1.2	1.2		
1 Collector	362.9									10.1		8.6	9.1	8.6	8.1	7.5	7.5		
4 1 Junction with Hwy #3 to Royal Oak Mine	5	1240		1240	1240	1240	1230	1330	1460	2.3		2.3	2.3	2.3	2.2	2.4	2.7		
4 10 Royal Oak Mine to Prelude Lake East Access	11.8	730		730	730	720	680	680	680	3.1		3.1	3.1	3.1	2.9	2.9	2.9		
4 43 Prelude Lake East Access to Tibbet Lake	52.4	100		100	100	100	100	100	100	1.9		1.9	1.9	1.9	1.9	1.9	1.9		
4 Collector	69.2									7.3		7.3	7.3	7.2	7.2	7.5	7.5		
5 1 Junction with Hwy #2 to Hay River Indian Village Access	2.5	560		560	530	520	510	520	520	0.5		0.5	0.5	0.5	0.5	0.5	0.5		
5 19 Hay River Indian Village Access to Birch Creek	24.8	170		170	160	160	170	170	170	1.6		1.6	1.5	1.4	1.5	1.6	1.6		
*5 48 Birch Creek to Junction with Hwy #6	33.1	170		170	170	170	170	170	170	1.5		1.5	1.5	1.5	1.5	1.5	1.5		
5 65 Junction with Hwy #6 to Salt River Village Access Road	187.8	80		80	70	70	70	80	70	5.3		5.5	5.0	4.8	5.0	5.1	4.9		
5 232 Salt River Village Access Road to Fort Smith Access (Trout St.)	13.5	130		130	120	120	120	110	110	0.6		0.6	0.6	0.6	0.5	0.5	0.5		
5 257 Fort Smith Access (Trout St.) to King St. Intersection	4.3	420		420	390	390	390	390	380	0.7		0.7	0.6	0.6	0.6	0.6	0.6		
5 Collector	266									10.3		10.4	9.7	9.4	9.7	9.9	9.6		
6 30 Junction with Hwy #5 to Little Buffalo Village Road	68.3	80		80	80	80	80	80	80	1.9		2.0	2.0	1.9	2.0	1.9	1.9		
6 74 Little Buffalo Village Road to Fort Resolution	21.7	120		110	100	110	100	100	110	0.9		0.8	0.8	0.8	0.8	0.8	0.8		
6 Collector	90									2.9		2.9	2.8	2.7	2.8	2.7	2.8		
7 35 BC Border to Fort Liard	37.6	120		120	120	120	120	120	120	1.6		1.6	1.6	1.6	1.6	1.6	1.6		
7 253 Fort Liard to Junction with Hwy #1	216.5	30		30	30	30	30	30	30	2.7		2.7	2.6	2.4	2.5	2.7	2.7		
7 Collector	254.1									4.3		4.3	4.3	4.1	4.1	4.3	4.3		
8 34 Yukon Border to Fort McPherson Access	85.4	50		50	50	40	40	40	40	1.6		1.6	1.6	1.1	1.1	1.1	1.1		
8 90 Fort McPherson Access to Mackenzie River Ferry	57.2	100		80	80	80	90	90	90	2.1		1.7	1.8	1.8	1.8	1.8	1.6		
8 243 Mackenzie River Ferry to Airport Access Road	116.7	80		80	80	70	80	90	80	3.3		3.3	3.3	3.2	3.4	3.8	3.4		
8 259 Airport Access Road to Tuk Park Access Road	6.1	740		740	690	630	630	630	630	1.6		1.6	1.5	1.4	1.4	1.4	1.4		
8 268 Tuk Park Access Road to Inuvik	3.9	1370		1270	1210	1120	1120	1150	1150	1.9		1.8	1.7	1.6	1.6	1.6	1.5		
8 collector	269.3									10.6		10.0	9.9	9.0	9.3	9.8	9.1		
Total Collector		<u>1311.5</u>								<u>45.4</u>		<u>43.5</u>	<u>43.1</u>	<u>41.2</u>	<u>41.2</u>	<u>41.3</u>	<u>40.6</u>		
Total Vehicle Kilometres Travelled										<u>121.4</u>		<u>116.3</u>	<u>115.3</u>	<u>108.2</u>	<u>106.2</u>	<u>105.2</u>	<u>104.7</u>		

Note: * denotes counter has been taken out of service

Percent increase from 1998 to 1999 = 0.5% (Arterial increase = -0.2%; Collector increase = 1.7%)

Percent increase from 1999 to 2000 = 1.0% (Arterial increase = 1.6%; Collector increase = -0.2%)

Percent increase from 2000 to 2001 = 1.9% (Arterial increase = 3.1%; Collector increase = 0.2%)

Percent increase from 2001 to 2002 = 6.6% (Arterial increase = 7.6%; Collector increase = 4.6%)

Percent increase from 2002 to 2003 = 0.9% (Arterial increase = 1.0%; Collector increase = 0.9%)

Percent increase from 2003 to 2005 = 4.4% (Arterial increase = 4.3%; Collector increase = 4.4%)

Average annual percent increase from 1998 to 2005 = 2.3% (Arterial increase = 2.7%; Collector increase = 1.7%)

Vehicle Kilometres Travelled (VKT) is a unit for measuring the amount of traffic on a road. It is calculated by multiplying the AADT by 365 days/year by the length of the road. I.E. (number of vehicles/day)(365 days/year)(number of kilometres assumed driven)=vehicle kilometres travelled per year
VKT indicates usage of a road and is typically used to calculate collision rates.

Figure 4
Estimated Vehicle Kilometres Travelled on Northwest Territories Highways

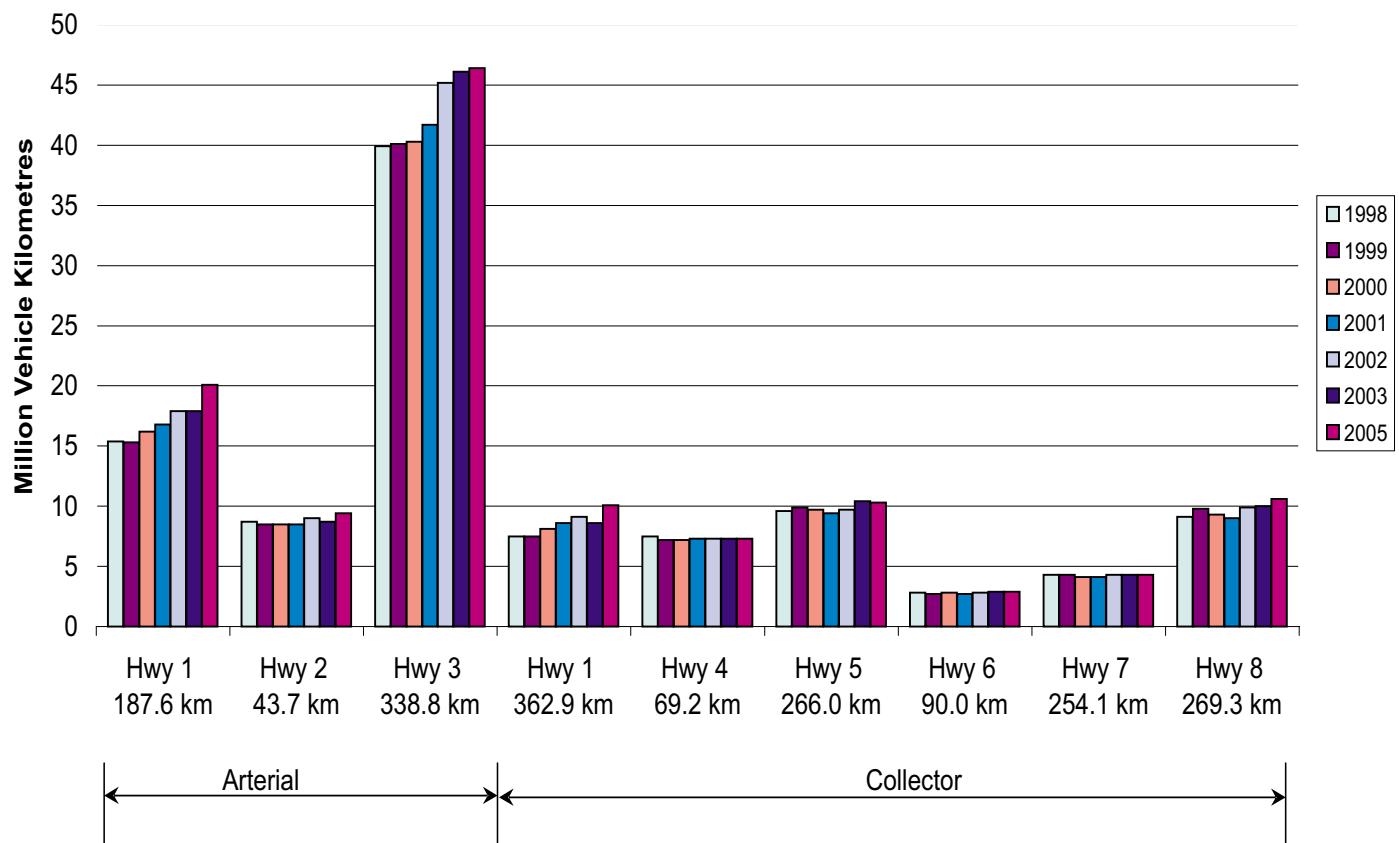
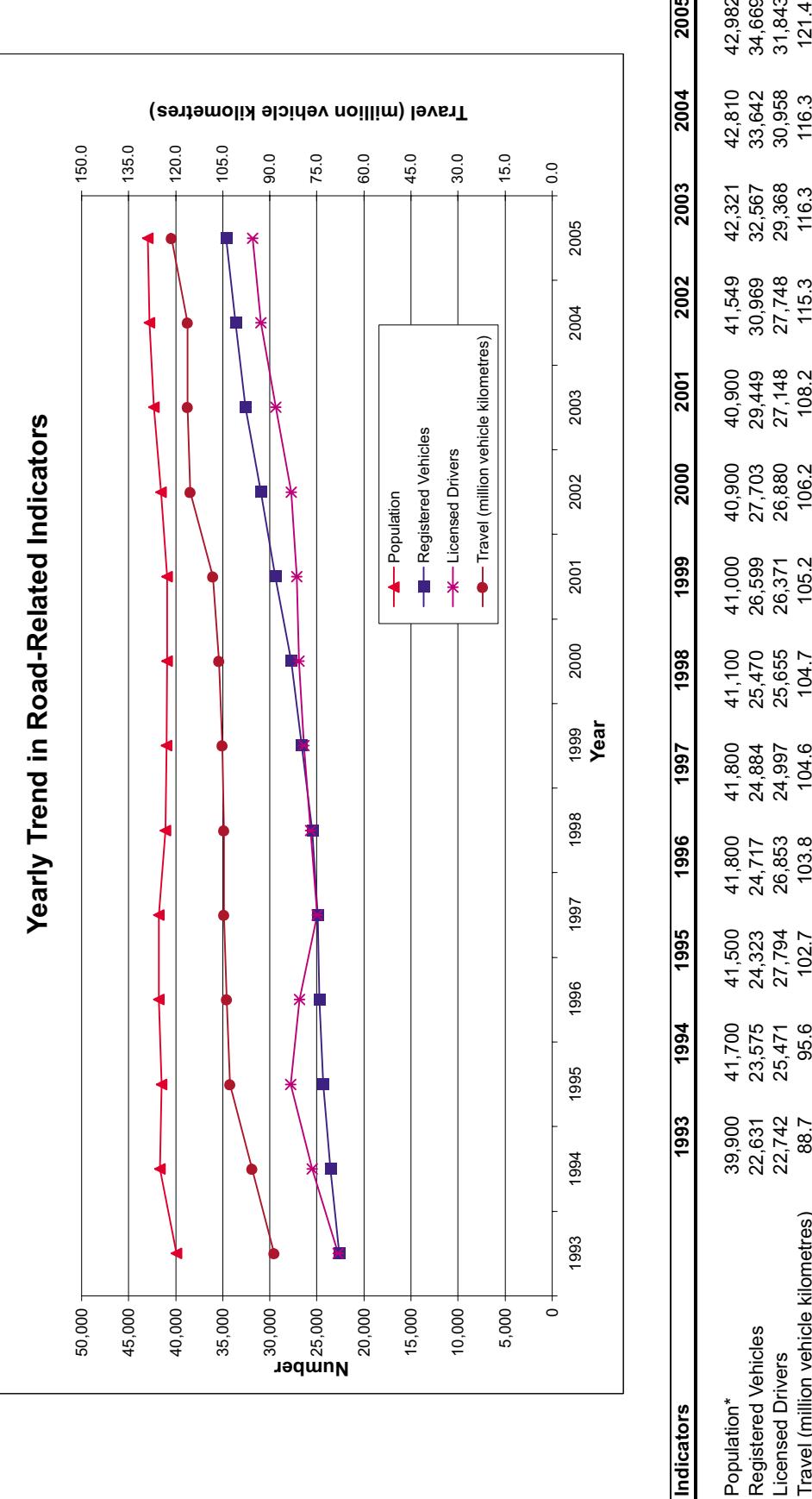


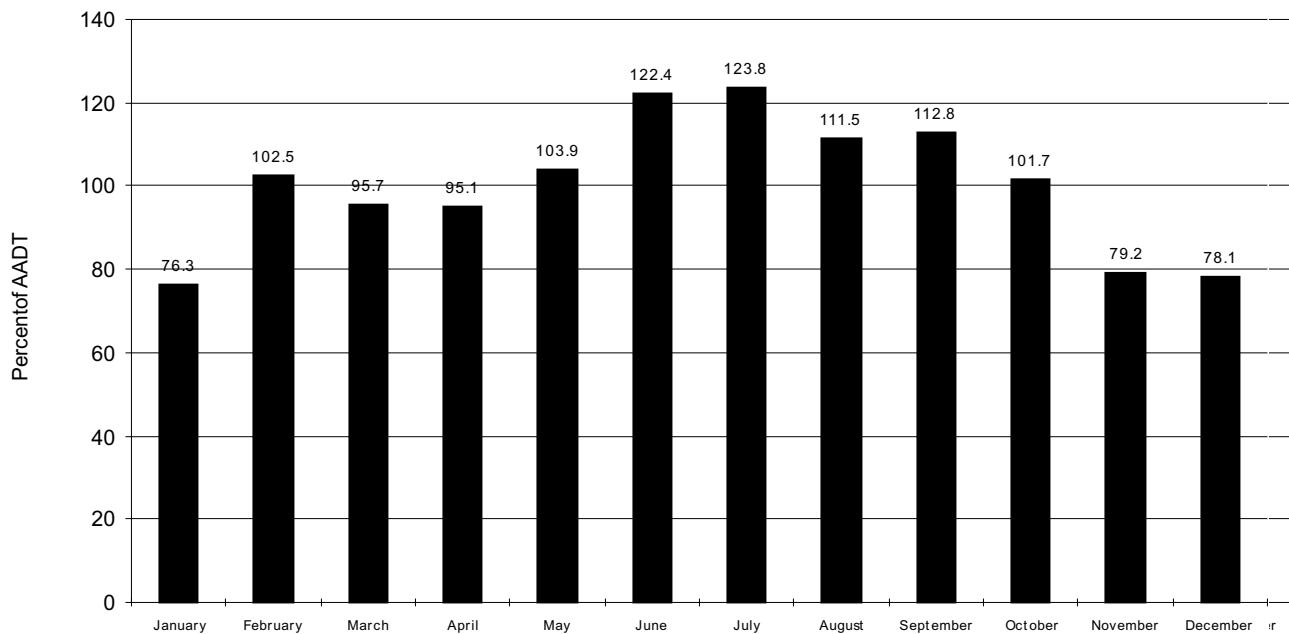
Figure 5



*Source: Northwest Territories Stats Bureau

Figure 6
Distribution of Monthly Traffic

Typical Near Urban Highway
(Hwy 3, Km 338)



Typical Rural Highway
(Hwy 5, Km 65)

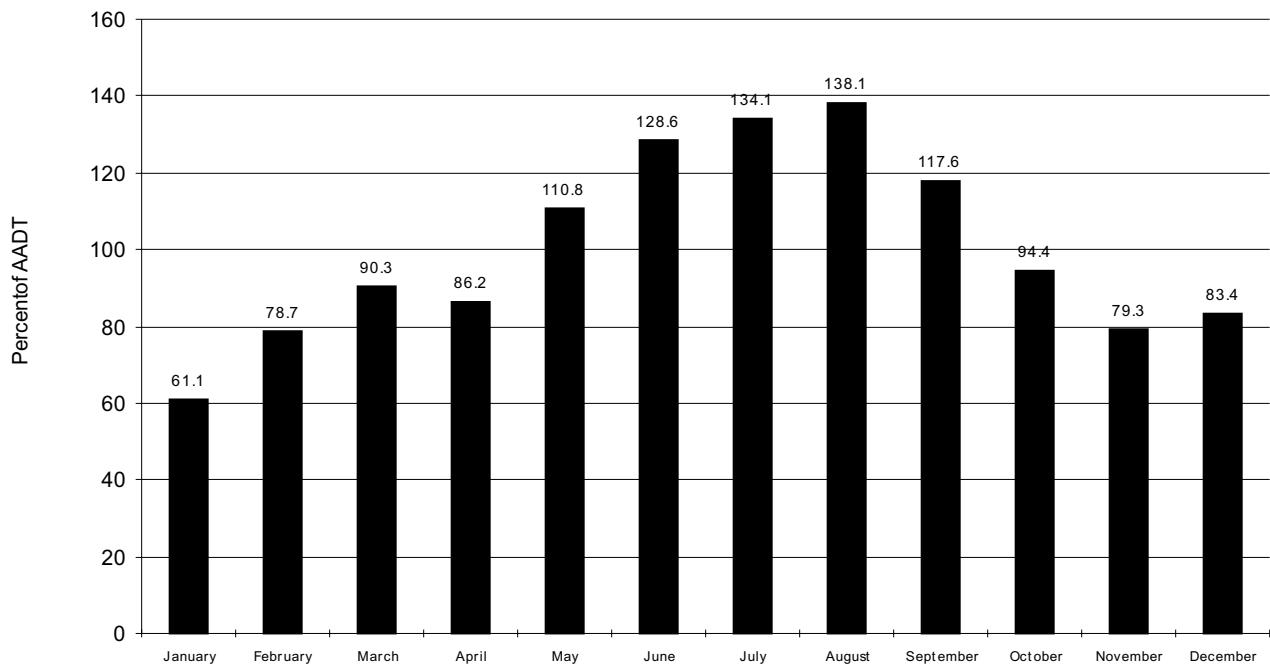
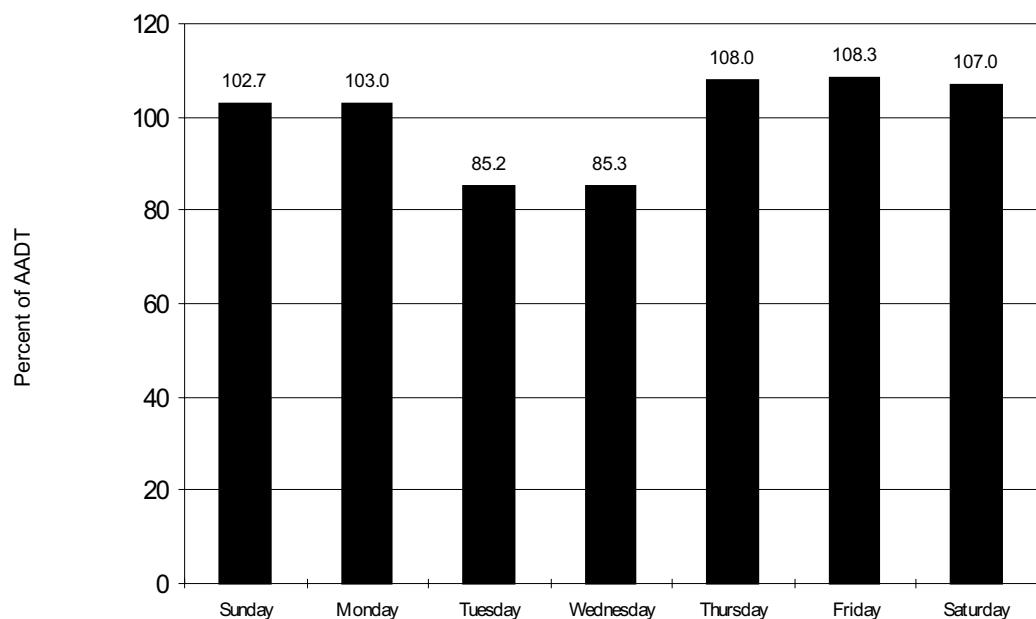


Figure 7
Distribution of Daily Traffic

Typical Near Urban Highway
(Hwy 3, Km 338)



Typical Rural Highway
(Hwy 5, Km 65)

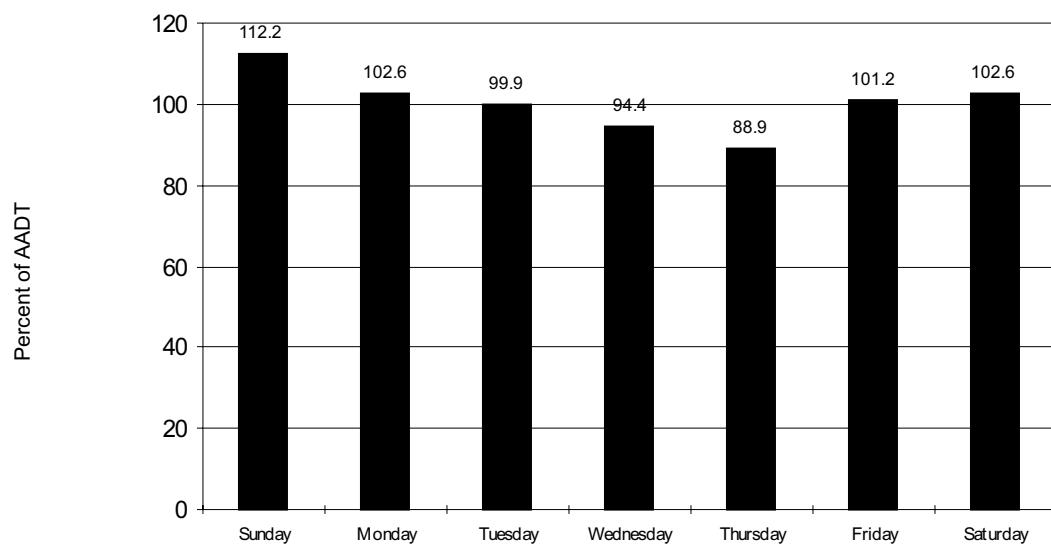
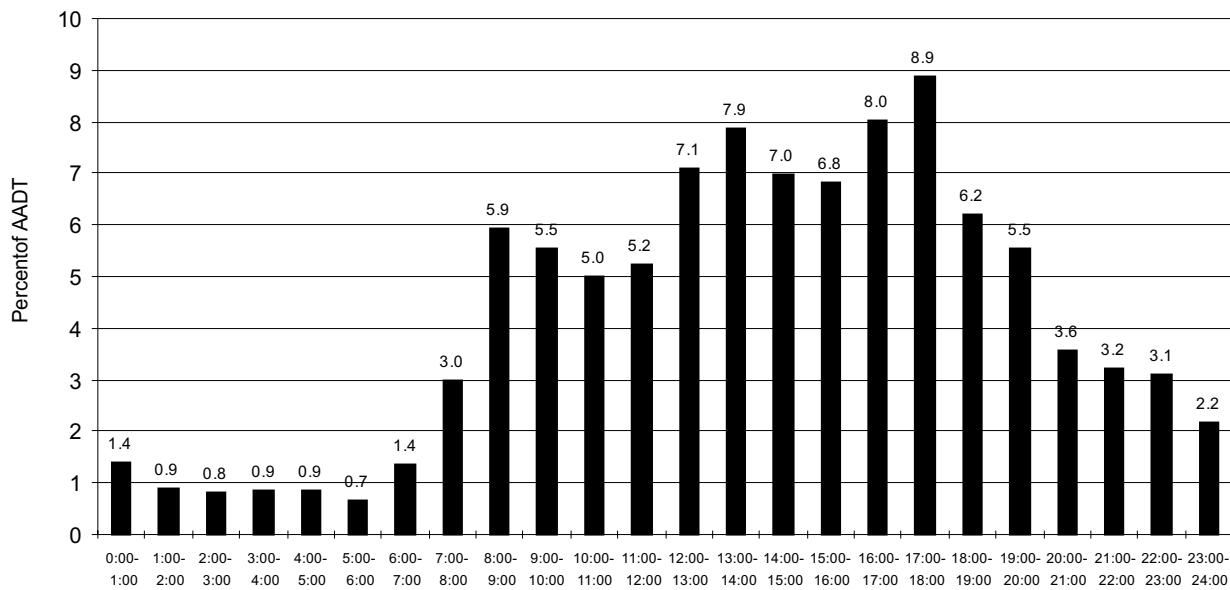
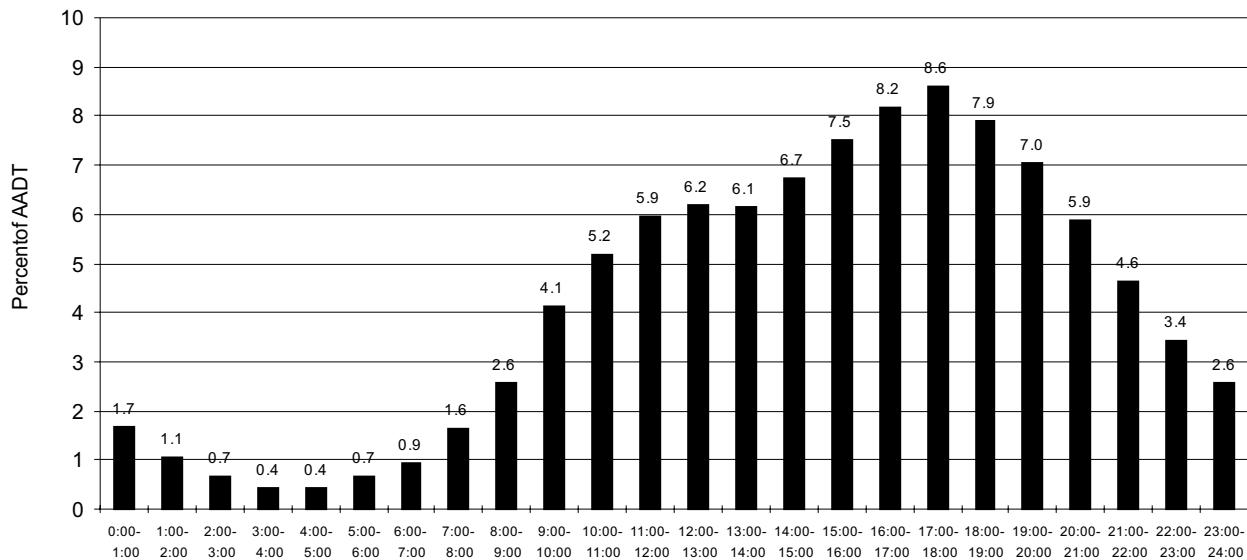


Figure 8
Distribution of Hourly Traffic

Typical Near Urban Highway
(Hwy 3, Km 338)



Typical Rural Highway
(Hwy 5, Km 65)



Section 3.0

Vehicle Movements at Ferries and Weigh Scales

Figure 9

Average Daily Traffic on Highway Ferries

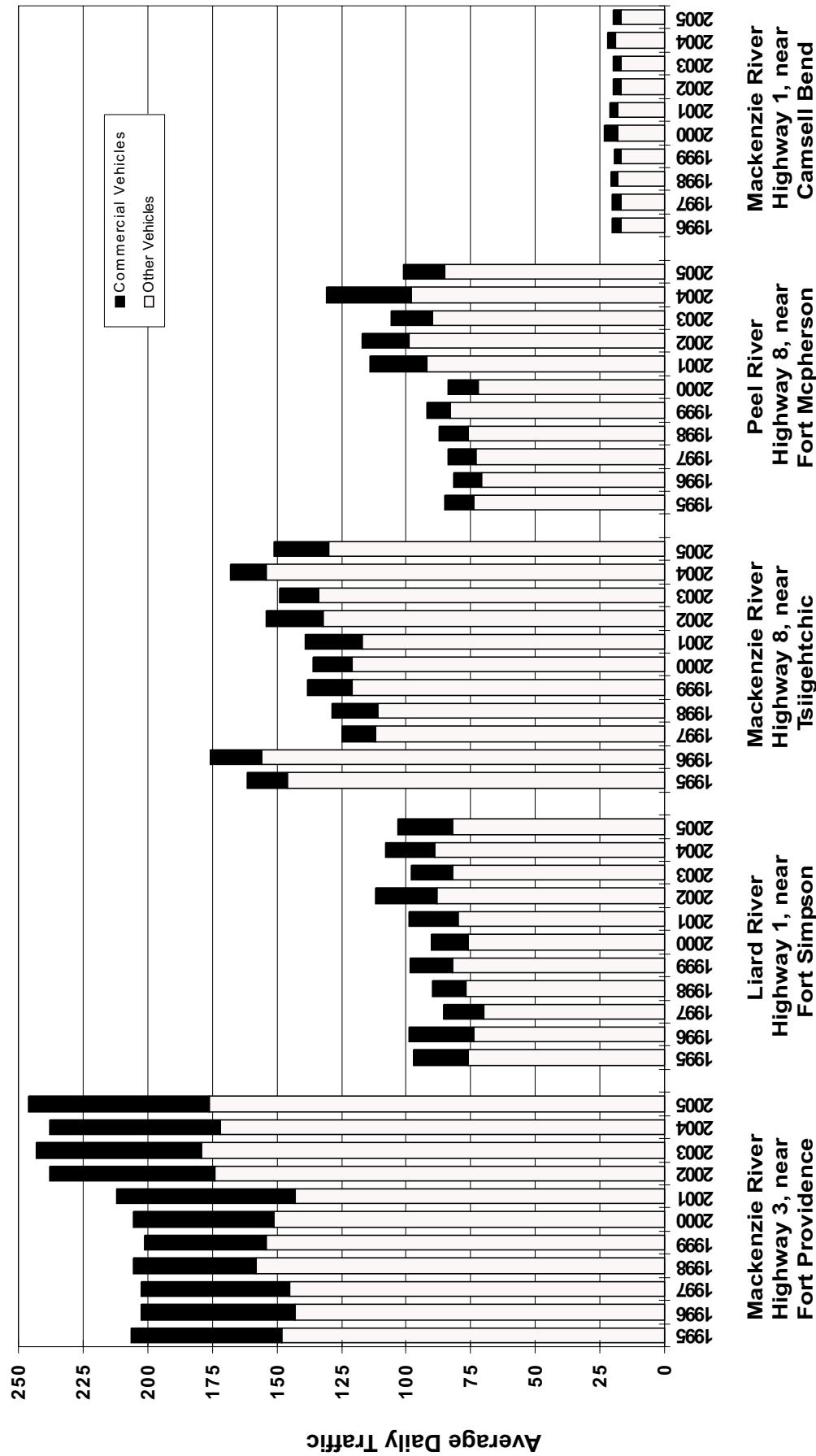


Table 9 Average Daily Traffic on Highway Ferries

Ferry Crossing	Location	Ferry	Vehicle Type	Year									
				2005	2004	2003	2002	2001	2000	1999	1998	1997	
Dory Point	Highway 3, near Fort Providence	M.V. Merv Hardie	Commercial Vehicles	70	66	64	64	69	55	47	47	58	59
			Light Vehicles	159	154	159	155	130	134	136	141	130	129
			Trailers Towed	17	18	20	19	13	17	18	17	16	14
			Total	246	238	243	238	212	205	201	206	202	206
Liard River	Highway 1, near Fort Simpson	M.V. Lafferty	Commercial Vehicles	21	19	16	24	19	14	16	13	16	25
			Light Vehicles	76	82	76	81	75	70	76	72	66	68
			Trailers Towed	6	7	6	7	5	6	6	5	5	6
			Total	103	108	98	112	99	90	98	90	87	98
Mackenzie River	Highway 8, near Tsiigehtchic	M.V. Louis Cardinal	Commercial Vehicles	21	19	15	22	22	15	17	18	13	20
			Light Vehicles	119	135	127	119	105	106	106	93	97	139
			Trailers Towed	11	14	7	13	12	13	15	15	15	17
			Total	151	168	149	154	139	134	138	126	125	161
Peel River	Highway 8, near Fort McPherson	C.F. Abraham Francis	Commercial Vehicles	16	33	16	18	22	12	9	11	11	11
			Light Vehicles	79	90	81	92	82	64	71	64	65	60
			Trailers Towed	6	8	9	7	10	8	12	12	8	11
			Total	101	131	106	117	114	84	92	87	84	81
Mackenzie River	Highway 1, near Camstell Bend	M.V. Johnny Berens	Commercial Vehicles	3	3	3	3	3	6	2	3	3	3
			Light Vehicles	16	18	16	16	17	17	16	17	17	16
			Trailers Towed	1	1	1	1	1	1	1	1	0	1
			Total	20	22	20	20	21	23	19	20	21	20

Table 111 Vehicle Classification Data at Liard River Ferry (Highway 1 near Fort Simpson, M.V. Lafferty)

Operating Season	Month	Total Traffic	Average Daily Traffic	Light Vehicles	Trailers Towed	Truck Single Unit	Truck Semi-Trailer	Percent of Total			Other	Total Commercial	Number of Passengers
								Total	Over size	Bus			
May 11/05	Nov 5/05	1,931	92	84.77	4.09	3.26	2.80	0.00	0.21	4.87	11.13	4,068	
	May-05	3,514	117	70.15	7.17	3.64	15.57	0.09	0.40	2.99	22.68	7,328	
	Jun-05	3,721	120	67.40	7.09	4.11	19.00	0.08	0.43	1.88	25.50	7,757	
	Jul-05												
	Aug-05	3,799	123	72.78	7.79	4.08	12.66	0.26	0.13	2.29	19.43	7,595	
	Sep-05	2,963	99	75.90	5.33	4.89	11.47	0.03	0.24	2.13	18.76	5,815	
	Oct-05	2,130	69	74.98	3.52	7.14	11.55	0.28	0.61	1.92	21.50	4,327	
	Nov-05	373	75	85.52	2.68	4.83	4.56	0.00	0.00	2.41	11.80	673	
	Total	18,431	103	73.46	6.15	4.42	12.98	0.12	0.32	2.54	20.38	37,563	
May 16/04	Oct 26/04	May-04	1,451	97	82.84	4.00	3.65	3.03	0.07	0.00	6.41	13.16	2,949
		Jun-04	3,225	108	73.83	6.42	2.95	12.68	0.16	0.37	3.60	19.75	6,551
		Jul-04	3,870	125	74.34	6.46	4.39	9.87	0.36	0.21	4.37	19.20	8,211
		Aug-04	3,774	122	75.46	7.68	3.95	8.37	0.32	0.29	3.92	16.85	8,125
		Sep-04	3,249	108	75.78	5.94	3.51	13.17	0.52	0.06	1.02	18.28	6,455
		Oct-04	2,095	81	80.14	2.58	4.96	10.21	0.38	0.24	1.48	17.28	4,045
		Total	17,664	108	76.14	5.96	3.88	10.15	0.32	0.22	3.34	17.91	36,336
May 13/03	Nov 4/03	May-03	1,797	95	86.03	3.62	2.78	3.78	0.00	0.22	3.56	10.35	3,796
		Jun-03	2,957	99	75.62	9.06	4.13	7.51	0.03	0.27	3.38	15.32	6,052
		Jul-03	3,072	99	76.30	8.79	2.96	8.76	0.23	0.13	2.83	14.91	6,797
		Aug-03	3,294	106	77.47	8.86	3.64	7.65	0.18	0.27	1.91	13.66	7,247
		Sep-03	3,173	106	72.68	5.01	4.85	15.51	0.66	0.25	1.04	22.31	5,886
		Oct-03	2,654	86	78.30	3.20	6.78	8.63	0.08	0.60	2.41	18.50	5,482
		Nov-03	246	62	84.15	2.85	5.69	2.85	0.00	0.00	4.47	13.01	439
		Total	17,193	98	77.18	6.67	4.25	8.95	0.22	0.28	2.45	16.16	35,679
May 22/02	Nov 6/02	Total	18,976	112	72.23	6.09	4.83	13.67	0.08	0.40	2.70	21.68	37,830
May 15/01	Nov 2/01	Total	17,146	99	75.7	5.7	5.3	9.4	0.3	0.5	3.1	18.7	34,612
May 10/00	Nov 3/00	Total	16,048	90	77.2	6.8	4.4	7.7	0.2	0.6	3.1	16.0	33,040
May 10/99	Nov 3/99	Total	17,376	98	77.5	5.8	4.3	8.7	0.2	0.9	2.5	16.7	34,907
May 06/98	Nov 10/98	Total	17,022	90	79.4	5.8	4.2	7.4	0	0.8	2.3	14.8	34,808
May 15/97	Nov 12/97	Total	14,885	87	74.7	6.1	5.1	10.7	0.1	0.9	2.4	19.2	30,666
May 6/96	Oct 26/96	Total	16,932	98	69	5.8	5.6	16	0.2	0.7	2.8	25.3	35,472
May 9/95	Oct 27/95	Total	16,846	97	71.6	6.5	5.1	14.4	0.2	0.2	2	21.9	34,734
May 6/94	Nov 6/94	Total	17,869	97	68.8	5.9	5.6	17.1	0.2	0.2	2.2	25.3	36,163
May 12/93	Nov 17/93	Total	14,053	74	71.6	10.5	6.5	9.2	0.1	0.3	1.8	17.9	29,516

Table 12 Vehicle Classification Data at Mackenzie River Ferry (Highway 8 near Tsiigehtchic, M.V. Louis Cardinal)

Operating Season	Month	Total Traffic	Average Daily Traffic	Light Vehicles	Trailers Towed	Truck Single Unit	Truck Semi Trailer	Percent of Total		Bus	Other	Total Commercial	Number of Passengers
								Over size	Over size				
May 27/05	Oct 29/05	368	92	78.80	4.08	9.51	2.72	0.00	0.00	4.89	17.12	648	
	Jun-05	4,851	162	78.46	8.25	3.22	7.07	0.08	0.02	2.91	13.30	8,863	
	Jul-05	5,703	184	77.80	10.45	3.09	6.33	0.28	0.28	1.77	11.75	11,778	
	Aug-05	5,815	188	78.07	7.62	5.19	6.72	0.22	0.05	2.12	14.31	12,280	
	Sep-05	3,983	133	80.99	2.86	5.45	9.19	0.05	0.00	1.46	16.14	7,749	
	Oct-05	2,536	91	81.98	0.95	4.10	12.03	0.28	0.00	0.67	17.07	4,912	
	Total	23,256	151	79.02	6.85	4.26	7.64	0.18	0.09	1.97	14.13	46,230	
June 4/04	Oct 20/04	Jun-04	4,665	173	77.64	13.40	2.66	5.04	0.06	0.02	1.18	8,96	
		Jul-04	6,298	203	78.09	12.00	1.79	6.35	0.11	0.16	1.49	9.91	
		Aug-04	6,090	196	83.63	6.58	2.28	5.85	0.43	0.07	1.17	10.478	
		Sep-04	4,261	142	80.66	2.58	3.66	12.41	0.28	0.07	0.33	16.76	
		Oct-04	2,260	108	81.68	1.55	3.36	12.17	0.13	0.04	1.06	16.77	
	Total	23,574	168	80.24	8.17	2.58	7.61	0.22	0.08	1.09	11.58	40,642	
June 5/03	Nov 2/03	Jun-03	4,449	171	83.86	6.47	1.84	7.01	0.22	0.04	0.54	9.67	
		Jul-03	5,679	183	83.85	5.85	1.60	7.48	0.07	0.30	0.85	10.30	
		Aug-03	5,397	174	84.82	6.15	3.35	4.63	0.04	0.24	0.76	12,359	
		Sep-03	3,763	125	87.14	2.07	1.49	8.90	0.08	0.05	0.27	9.02	
		Oct-03	2,973	96	86.68	0.13	2.99	9.35	0.24	0.07	0.54	13.19	
		Nov-03	50	50	96.00	0.00	4.00	0.00	0.00	0.00	4.00	113	
	Total	22,311	149	85.05	4.63	2.25	7.17	0.12	0.16	0.62	10.32	48,269	
June 4/02	Oct 19/02	Total	21,130	154	77.24	8.27	3.86	8.11	0.59	0.13	1.80	14.49	
June 5/01	Oct 27/01	Total	19,827	139	75.2	8.9	2.9	11.3	0.3	0.1	1.3	15.9	
June 6/00	Oct. 23/00	Total	18,795	134	78.7	9.8	2.5	6.9	0.1	0.1	1.8	11.5	
June 2/99	Oct. 15/99	Total	19,028	138	76.5	11.0	3.3	7.2	0.1	0.2	1.7	12.5	
May 27/98	Oct. 23/98	Total	19,149	126	74.1	11.9	3.8	4.8	0.0	0.3	5.1	13.9	
June 4/97	Oct 19/97	Total	16,894	125	77.2	12.3	2.5	4.9	0.1	0.7	2.4	10.5	
June 4/96	Oct 16/96	Total	23,570	175	79.3	9.5	2.9	5.9	0.5	0.5	1.4	11.2	
May 24/95	Oct 24/95	Total	24,620	160	81.9	8.4	2.1	5.3	0.3	0.5	1.5	9.7	
May 30/94	Oct 30/94	Total	27,052	176	82.9	5.9	3	4.6	0.3	0.5	2.8	11.2	
June 4/93	Oct 28/93	Total	25,132	171	75.3	12.1	2.3	5.7	0.7	0.3	3.5	12.6	

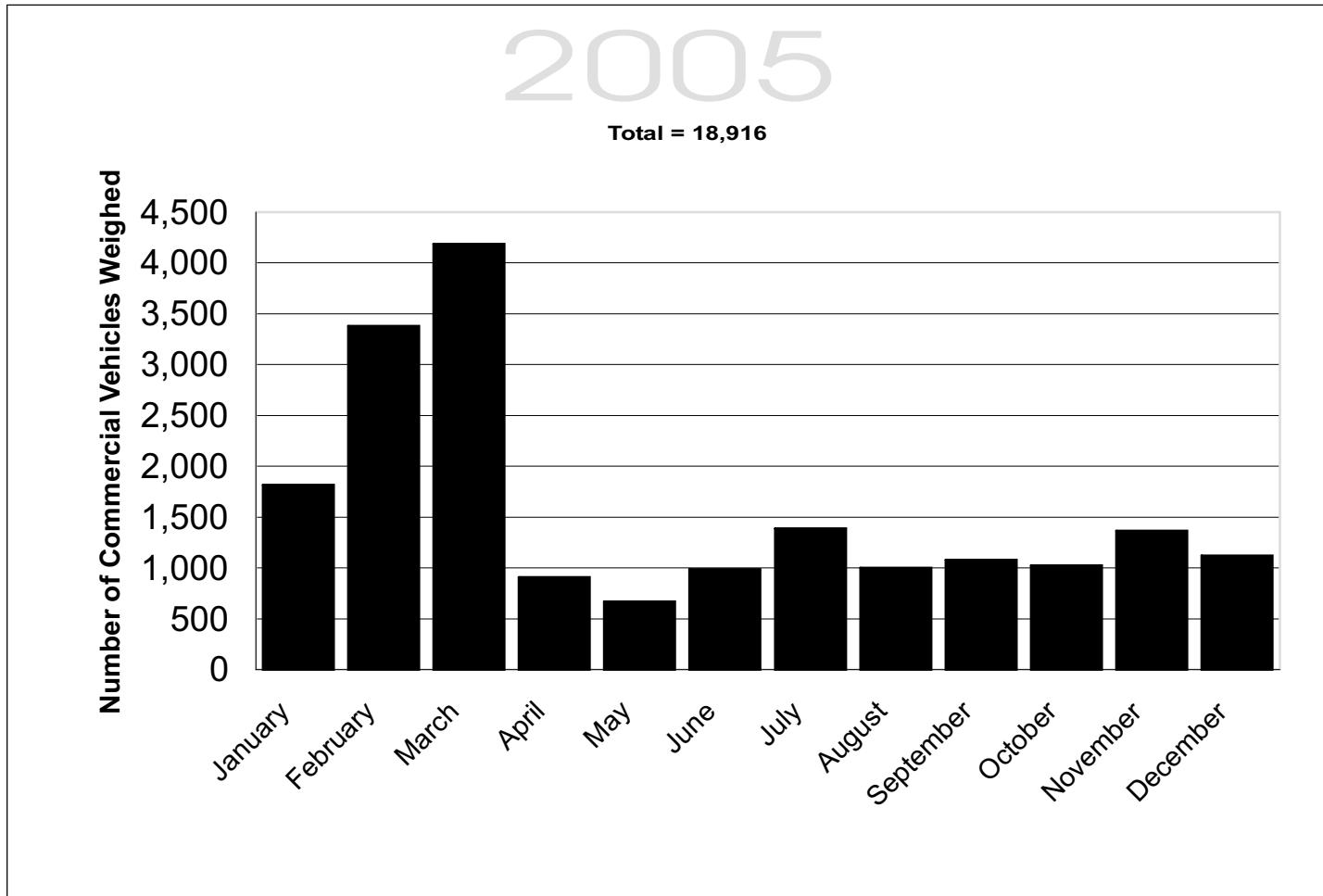
Table 13 Vehicle Classification Data at Peel River Ferry (Highway 8 near Fort McPherson, C.F. Abraham Francis)

Operating Season	Month	Total Traffic	Average Daily Traffic	Light Vehicles	Trailers Towed	Truck Single Unit	Truck Semi-Trailer	Percent of Total		Bus	Other	Total Commercial	Number of Passengers
								Over size	Total				
May 25/05	Oct 24/05	242	35	80.99	5.79	2.07	5.79	0.00	0.00	5.37	13.22	509	
	Jun-05	2,636	90	74.37	7.23	0.70	11.94	0.45	0.04	5.27	18.40	5,153	
	Jul-05	5,181	167	80.04	6.93	2.93	7.62	0.27	0.25	1.95	13.03	11,653	
	Aug-05	3,688	119	80.88	6.45	1.79	7.35	0.52	0.11	2.90	12.66	7,984	
	Sep-05	2,413	80	78.37	2.78	1.82	14.71	0.75	0.08	1.49	18.86	4,883	
	Oct-05	1,226	51	71.86	1.71	2.37	19.41	0.08	0.08	4.49	26.43	2,082	
	Total	15,335	101	78.36	5.79	2.04	10.33	0.41	0.14	2.94	15.86	32,284	
June 2/04	Oct 25/04	3,180	110	75.06	11.51	2.26	7.30	0.06	0.06	3.74	13.43	5,718	
	Jun-04	5,406	174	70.59	7.51	2.09	6.84	0.26	0.24	12.47	21.90	10,245	
	Jul-04	6,023	194	73.83	4.75	0.91	5.99	0.45	0.05	14.01	21.42	8,897	
	Aug-04	3,230	108	59.41	2.32	0.80	15.26	0.12	0.06	22.01	38.27	4,498	
	Sep-04	1,638	61	49.88	1.59	0.18	15.96	0.24	0.00	32.16	48.53	2,002	
	Total	19,537	131	68.67	5.94	1.38	8.84	0.26	0.10	14.81	25.39	31,360	
June 4/03	Oct 29/03	2,323	86	68.40	15.93	3.96	7.88	0.52	0.04	3.27	15.67	5,275	
	Jun-03	4,024	130	69.73	12.97	0.77	11.53	0.32	0.32	4.35	17.30	8,830	
	Jul-03	5,230	169	85.03	6.52	0.50	4.63	0.88	0.84	1.61	8.45	10,264	
	Aug-03	2,652	88	74.89	4.11	1.17	17.99	0.41	0.00	1.43	20.00	5,028	
	Sep-03	1,486	51	79.95	0.94	1.01	17.83	0.07	0.20	0.00	19.11	2,836	
	Total	15,715	106	76.46	8.63	1.24	10.38	0.53	0.39	2.37	14.91	32,233	
May 27/02	Oct 25/02	17,810	117	78.72	5.72	1.73	9.34	1.07	0.52	2.91	15.56	37,322	
June 10/01	Oct 29/01	Total	16,114	114	71.8	8.6	3.1	14.4	0.3	0.4	1.4	19.6	31,498
June 6/00	Oct 26/00	Total	11,959	84	76.3	9.7	1.7	9.0	0.3	0.5	2.6	14.1	27,823
May 31/99	Oct 15/99	Total	12,713	92	76.8	13.4	0.8	5.6	0.5	0.5	2.4	9.8	28,066
May 27/98	Oct 22/98	Total	13,097	87	73.8	13.2	1.4	6.9	0.3	0.4	4.0	13.0	32,775
June 3/97	Oct 20/97	Total	11,738	84	77.0	9.7	1.6	7.4	0.1	0.5	3.7	13.3	27,454
June 3/96	Oct 19/96	Total	11,237	81	73.5	13.3	1.8	8.2	0.1	0.5	2.7	13.3	25,891
May 22/95	Oct 24/95	Total	13,247	85	72.4	14.6	1.1	8.7	0	0.4	2.7	13.0	31,485
May 27/94	Oct 29/94	Total	14,012	90	74.9	12.4	0.8	9.1	0.0	0.3	2.5	12.7	35,352
June 3/93	Oct 29/93	Total	14,561	98	77.6	9.9	0.8	8.8	0.2	0.6	2.2	12.6	38,078

Table 14 Vehicle Classification Data at Mackenzie River Ferry (Highway 1, road to Wrigley, near Camsell Bend, M.V. Johnny Berens)

Operating Season	Month	Total Traffic	Average Daily Traffic	Light Vehicles	Trailers Towed	Truck Single Unit	Truck Semi-Trailer	Percent of Total		Bus	Other	Total Commercial	Number of Passengers
								Over size	Total				
May 20/05 Nov 4/05	May-05	226	19	69.91	0.44	23.89	0.00	0.00	0.44	5.31	29.65	437	
	Jun-05	493	16	81.74	3.65	5.27	3.85	0.00	1.01	4.46	14.60	1,036	
	Jul-05	696	22	81.32	6.18	6.90	2.44	0.00	0.72	2.44	12.50	1,588	
	Aug-05	680	21	86.06	6.21	3.48	1.52	0.00	0.30	2.42	7.73	1,409	
	Sep-05	638	21	82.92	5.17	6.43	3.92	0.00	0.00	1.57	11.91	1,243	
	Oct-05	533	17	82.55	2.63	5.63	6.94	0.00	0.00	2.25	14.82	993	
	Nov-05	81	20	77.78	0.00	14.81	4.94	0.00	0.00	2.47	22.22	152	
	Total	3,327	20	81.97	4.51	7.03	3.37	0.00	0.39	2.74	13.53	6,858	
May 28/04 Oct 22/04	May-04	77	19	89.61	2.60	5.19	0.00	0.00	0.00	2.60	7.79	173	
	Jun-04	503	17	87.28	1.19	9.54	0.40	0.00	0.00	1.59	11.53	1,125	
	Jul-04	707	23	82.46	5.52	5.94	3.54	0.00	0.57	1.98	12.02	1,613	
	Aug-04	686	22	85.71	4.96	5.83	2.04	0.00	0.00	1.46	9.33	1,493	
	Sep-04	761	25	81.73	4.34	3.94	8.67	0.00	0.00	1.31	13.93	1,409	
	Oct-04	508	23	79.53	3.35	6.10	8.27	0.00	0.00	2.76	17.13	857	
	Total	3,242	22	83.44	4.04	6.01	4.60	0.00	0.12	1.79	12.52	6,670	
May 30/03 Oct 31/03	May-03	37	19	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	103
	Jun-03	477	16	79.66	3.14	9.64	2.10	0.00	0.00	5.45	17.19	1,001	
	Jul-03	611	20	74.96	3.76	13.58	4.42	0.00	0.00	3.27	21.28	1,302	
	Aug-03	671	22	86.14	4.47	5.37	1.49	0.00	0.00	2.53	9.39	1,641	
	Sep-03	672	22	84.67	6.55	5.51	1.19	0.00	0.00	2.08	8.78	1,335	
	Oct-03	695	22	82.45	3.02	6.91	5.76	0.00	0.00	1.87	14.53	1,334	
	Total	3,163	20	82.04	4.20	7.90	3.00	0.00	0.00	2.85	13.75	6,716	
May 31/02 Nov 01/02	Total	3,106	20	79.65	5.54	6.89	3.86	0.35	0.13	3.57	14.81	6,402	
May 22/01 Oct 29/01	Total	3,404	21	79.5	5.5	6.1	2.9	1.0	0.5	4.3	14.8	6,742	
May 20/00 Oct 30/00	Total	3,786	23	72.9	3.3	3.9	3.3	0.3	0.2	16.2	23.8	7,593	
May 21/99 Oct 16/99	Total	2,779	19	82.6	4.8	4.7	2.8	0.0	0.1	4.9	12.6	7,270	
May 15/98 Nov 03/98	Total	3,384	20	83.9	3.2	4.6	4.4	0.3	0.1	3.4	12.9	8,959	
May 18/97 Oct 27/97	Total	3,396	21	82.6	1.8	8.8	2.0	0.1	0.2	4.4	15.6	8,448	
May 22/96 Oct 25/96	Total	3,161	20	80.0	4.5	4.9	5.2	0.2	0.1	5.2	15.5	6,926	
May 17/95 Oct 16/95	Total	2,990	20	83.3	2.4	6.0	4.2	0.6	0.1	3.3	14.3	6,935	
June 3/94 Nov 2/94	Total	2978	19	82.2	1.7	5.4	6.7	0.6	0.3	3.1	16.1	6,712	

Figure 10
Commercial Vehicles Weighed
at the Enterprise Weigh Scale



Total Vehicles Weighed

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2005	1,816	3,378	4,187	907	667	987	1,387	1,000	1,080	1,024	1,363	1,120	18,916
2004	1,551	2,866	3,858	596	582	1,225	844	1,046	1,358	1,102	870	838	16,736
2003	1,229	2,788	3,883	675	739	693	1,169	729	953	1,144	976	924	15,902
2002	1,448	2,913	3,358	892	336	1,114	982	854	1,054	1,123	1,128	803	16,005
2001	1,881	2,230	3,410	1,257	566	874	730	767	842	839	938	240	14,574
2000	1,051	1,862	2,266	522	501	830	720	703	681	798	795	762	11,491

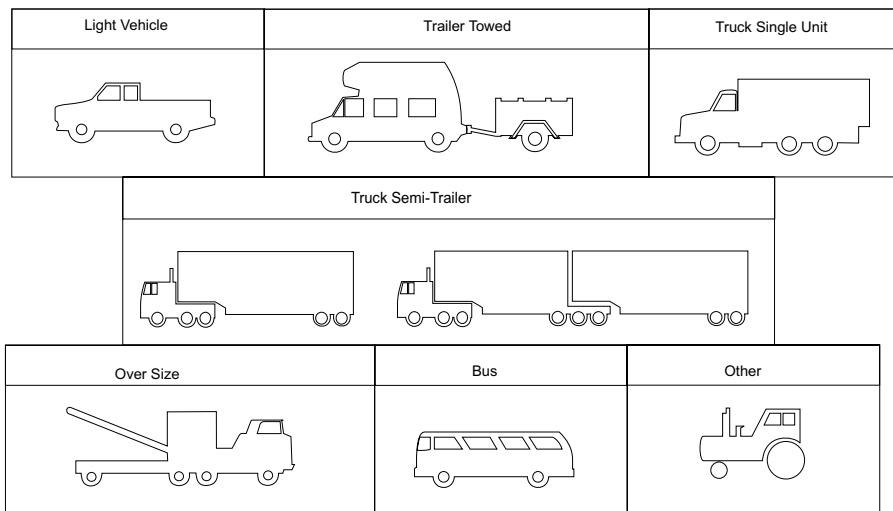
Note:

(1) A commercial vehicle is any vehicle with a GVW over 4500 kg.

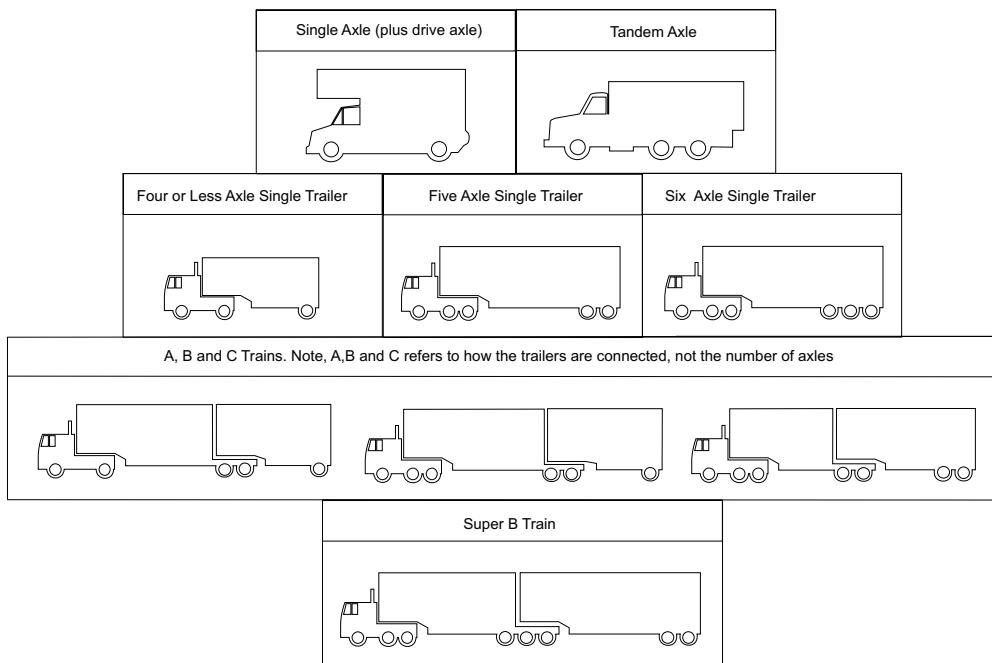
(2) In December 2001, it is estimated that only one-third of the data was collected due to weigh scale closures.

Figure 11
Vehicle Classifications

Highway Ferries



Weigh Scale Classification



Note: For more information regarding commercial vehicle definitions and allowable weights, please see the *Large Vehicle Control Regulations* under the *Motor Vehicles Act* available at www.justice.gov.nt.ca

Appendix A

Historical Data

The Department has been actively collecting data since its formation in 1989. This Traffic Report shows the current state of the system only, however the following historical data is available:

- **Short-term Visual Counts** – Vehicles are classified and counted manually at various highway junctions throughout the territory. The data is used to enhance vehicle classification and AADT calculations.
- **Short-term Intersection Volume Counts** – Vehicles are counted by direction and turning movement, which gives an indication of overall traffic flow at selected intersections on the highway system.
- **Historical AADT** – Average daily traffic, broken down by month and year, is also available from 1989 through to 1997. AADT from 1998 through to the present is located in Table 3.
- **Historical Tibbitt to Contwoyto Winter Road Data** - shows the same information contained in Table 7 of the report for 1994-1997

The Department will provide the above data upon request. Please refer to the acknowledgements section in the front of this report for contact information.

Appendix B

Data Processing Methodology

Data Processing Methodology

The primary goal in traffic data collection is to determine Average Annual Daily Traffic (AADT). The most concise way of doing this is to collect traffic data at a site for a year, sum the traffic counts over the year and then divide by 365 days. However, for a number of reasons including routine maintenance, breakdowns and faulty data modules, no counter runs at 100% operational capacity for an entire year. Therefore, adjustments must be made for gaps in the data.

Three steps are involved in the processing of traffic data. Step one is to fill in as much missing data as possible for the year in question. Step two involves applying an AADT formula to the data and step three consists of independently verifying the calculated AADT through other sources and previous experience. The following steps outline this process in more detail:

Step One

- If less than one week of data is missing, an average of the hourly count in the week prior and the week following is calculated and applied to the missing data.
- If over one week of data is missing but less than a month, the first step is to obtain the data from the previous year. If the data cannot be found, an average of the first prior week and the first following week is calculated and applied to the missing data.
- If over one month of data is missing, data from previous years is applied through a growth rate algorithm. The results are analysed for accuracy and completeness through comparisons with other traffic counter sites, data from other sources and previous experience.
- Growth rate is determined at each site by comparing available monthly average daily traffic from year to year and averaging over the last four years.

Step Two

- AADT is determined using an industry standard American Association of State Highway and Transportation Officials (AASHTO) formula (see below). After step one is applied there is a strong possibility that there will still be incomplete data for the year. The AASHTO formula directly accounts for missing data by computing an average of averages.

$$AADT = \frac{1}{7} \sum_{i=1}^7 \left[\frac{1}{12} \sum_{j=1}^{12} \left(\frac{1}{n} \sum_{k=1}^n VOL_{ijk} \right) \right]$$

Where: Vol = daily traffic for day k, of day-of-week i, and month j

i = day of the week

j = month of the year

k = 1 when the day is the first occurrence of that day of the week in a month, 4 when it is the fourth occurrence.

n = the number of days of that day of week during that month (usually between 1 and 5, depending on the number of missing data).

Step Three

- Calculated AADT numbers are compared against previous years' values, other sources of traffic information such as ferry logs and Tibbitt to Contwoyo Winter Road logs, upstream and downstream counter sites and previous experience.
- If results of the AADT algorithms are deemed inaccurate at a particular site, the AADT for the year will be estimated by applying an appropriate growth rate to the previous year's AADT.

Note: For counters located on access roads and winter roads no extra information is introduced. Only the data collected in the current year is presented.

For more detailed information, please contact the Planning and Policy Division of the Department of Transportation as listed in the Acknowledgements section of this report.