Task 2 Technical Report
Level of Service - Diversion Programs

RECYCLING SYSTEM OPTIONS

City of Temiskaming Shores

November 13, 2009

Project No. 1055039

Table of Contents

Table of Contents

List of Tables

Table of Contents

List of Figures

1.0 Introduction: Task 2 – Recycling Level of Service

The purpose of Task 2 is to determine an appropriate level of service for recycling collection in the City. An analysis of the City's current recycling program was undertaken to determine a baseline of services offered. The analysis included costs associated with the program, diversion rates achieved, recycling services offered in both the residential and IC&I sectors; issues identified with the current system, facility information; and, the current waste collection contract. Other aspects considered when determining the appropriate level of recycling service were common recyclable materials in Ontario, legislation, economic market conditions, projected material quantities, and the various options available for enhancing the recycling program.

2.0 Review of Current Recycling System

Background information regarding the City of Temiskaming Shore's current recycling program as well other details on similar municipal recycling programs and governing legislation are included in this review. The following is a list of key sources consulted:

- The City of Temiskaming Shores Solid Waste Management Master Plan. Earth Tech (Canada) Inc. March 5, 2008.
- The City of Temiskaming Shores Council in Committee Report No. PW-054-01-2007 Old Corrugated Cardboard (OCC) – Fibre Pick Up. November 20, 2007.
- The City of Temiskaming Shores Council in Committee Report No. PW-054-2007 Old Corrugated Cardboard (OCC) – Fibre Pick Up. August 2, 2007.
- The City of Temiskaming Shores Appendix 2 – Applicable Tipping Fees to Request for Proposal PW-RFP-004-2009.
- The Corporation of the City of Temiskaming Shores By-Law No. 2009-061 Being a By-Law to Enter into an Agreement with Phippen Waste Management Limited for the Collection, Removal and Disposal of Refuse. May 19, 2009.
- The Corporation of the Town of Haileybury By-Law No. 2000-055 Being a By-Law to Authorize an Agreement with the Town of Cobalt and the Township of Dymond. November 1, 2000.

- Corporation of the Town of Haileybury By-Law 94-15 Being a By-Law to Establish a System for the Collection and Disposal of Garbage and other Refuse and to Designate certain Lands for the Garbage Disposal. March 8, 1994.
- The Corporation of the Town of New Liskeard By-Law No. 2807. October 7, 2002.
- The Corporation of the City of Temiskaming Shores By-Law 2008-166 being a By-Law to Amend Town of New Liskeard By-Law No. 2807. December 16, 2008.
- The Corporation of the Township of Dymond By-Law No. 799. December 1, 1977.
- The Corporation of the Township of Dymond By-Law No. 1160. June 6, 1995.
- The Corporation of the City of Temiskaming Shores By-Law 2008-167 being a By-Law to Amend Township of Dymond By-Law No. 799.
- Analysis of City of Owen Sound Waste Audit/Recycling Plan Data for Industrial Commercial & Institutional Premises. Kelleher Environmental. November 24, 2008.
- The Private Sector IC&I Waste Management System in Ontario. RIS International Ltd. January 2005.
- Report on Ontario Blue Box Material Recovery Facilities. Entec Consulting Ltd. March 2007.
- Ottawa Valley Waste Recovery Centre Business and Master Plan. MacViro. April 20, 2006.
- Community Profiles from the 2006 Census. Statistics Canada.
- City of Temiskaming Shores 2009 Community Profile. Tunnock Consulting Ltd. August 19, 2009.
- City of Temiskaming Shores Draft Official Plan. Tunnock Consulting Ltd. April 30, 2009.

2.1 OVERVIEW

The City of Temiskaming Shore's (the City) recycling program is provided by the Cochrane Temiskaming Waste Management Board (CTWMB). The CTWMB is divided into two (2) service zones, southern and northern, and provides recycling services to sixteen (16) municipalities. The City is part of the board's southern zone which includes the communities of Temagami, Cobalt, Evanturel, Englehart, Charlton, and Chamberlain. Presently, the City of Temiskaming Shores Public Works Operations Manager serves as the administrator for the Board's southern node. The City

receives $10,000 annually for the services provided. Similar to the City's waste collection program, the recycling program is governed by existing by-laws of its former municipalities within the CTWMB.

The CTWMB is conducted in accordance with the provisions of a comprehensive agreement which provides for the *'joint management and operation of garbage collection and disposal systems or other municipal systems or services for the establishment of joint boards of management thereof and pursuant to Municipal Statute Amendment Act, 1993, S.O. 1993 c.20, Section 1 which provides for the passing of bylaws to establish, maintain and operate a waste management system'.*

Each of the municipalities participating in this recycling program has instituted by-laws to enter into an agreement with other municipalities for the joint management and operation of the Joint Waste Management (Recycling) Program. The CTWMB agreement was instituted on November 6, 1995.

The Board is composed of one member from each of the signatory municipalities. The Board annually selects a Chairperson, Vice-Chairperson, Secretary and Treasurer from its members for a one year term. An Executive Committee, composed of the Chairperson, the Vice-Chairperson and two other members, is also appointed annually. The Board is required to meet at least four times a year. Responsibilities of the board are as follows:

- Promoting and encouraging recycling;
- Maintaining records and statistics on the waste management program;
- Taking meeting minutes;
- Entering into contracts or agreements for the implementation of the Waste Management Program;
- Preparing and approving an annual budget;
- Providing an annual detailed account of the Waste Management Program's expenditures;
- Forwarding quarterly and annual statements to the Board members;
- Collecting each member municipalities' proportionate share of the capital and operating expenses;
- Disbursing funds as are properly due and owing;
- Consulting with the Ministry of the Environment regarding the implementation and operation of the Waste Management Program;
- Ensuring the proper insurance, legal and accounting services are provided for the management and operation of the Waste Management Program;
- Designating the types of waste materials to be collected for waste management purposes;
- Making the appropriate applications and reports on behalf of the Board members to receive and account for all grants, subsidies and other monies received;
- Purposing by-laws for each of the parties hereto to enact in order to further the goals and objectives of the Waste Management Program;

- Setting fees for the costs of operating and/or managing the Waste Management Program and to amend the fees as required;
- Borrowing funds only as required for approved budget items;
- Establishing bank accounts for the Waste Management Program;
- Setting, reviewing, and updating policies, procedures and systems for the efficient operation of the Waste Management Board;
- Establishing and maintaining suitable accounting systems to ensure proper control over revenues and disbursements; and
- Hiring, directing, supervising, and dismissing employees if necessary subject to allocations in the budget.

Of importance to this particular study is the City's ability to withdraw from the CTWMB agreement, if the recommendations of this report support such action. Section 3 (c) of the CTWMB Agreement states:

> *"Each party hereto shall participate in the Waste Management Program in accordance with the provisions of this Agreement. Any party to this Agreement, may withdraw from its participation in the Waste Management Program and its obligations thereunder at any time after is capital contributions as set out in Schedule "C" hereto has been paid in full. However in order to withdraw, such party must deliver a notice in writing before the 1st day of June in the year of the proposed withdrawal to every Clerk of each and every other part to this Agreement declaring its intention to withdraw and such withdrawal shall only be effective as of December 31st in that year. Each party hereto acknowledges that in the event that it withdraws from the Waste Management Program, there shall be no refund of any of the capital at that time subject to what is hereinafter set out. In addition there shall be no refund of any operating or other costs paid by such party to the Board. In addition the party withdrawing shall continue to contribute its annual household levy in accordance with Schedule "A" until its notice of withdrawal becomes effective. Upon such withdrawal becoming effective, the Board shall authorize KAO [the Corporation of the Town of Kapuskasing], as Trustee of the assets of the Board, to transfer to the party so withdrawing title to all assets, if any, which form the recycle deposit depot(s) in the Municipality so withdrawing.*
>
> *In the event that the Board disbands or is otherwise dissolved the net assets (or the net proceeds from the sale thereof) remaining after the payment of all of the Board's debts, costs, liabilities and obligations shall be divided among the parties herein as follows: Where a party or parties hereto have withdrawn from the Waste Management Program prior to the disbanding of the Board or other dissolutions, such party shall receive its proportionate share as set out in Schedule "A", of the*

value of the net assets which were in existence both on the date such party's notice of withdrawal became effective and on the date of dissolution and such value shall be equal to the lesser of the following:

i. The value of the net assets on the date the notice of withdrawal became effective;

ii. The value of the net assets on dissolutions;

iii. The net proceeds realized on the sale of the assets; and,

iv. The actual value of the total capital contributions made by the party prior to its withdrawal from the Waste Management Program less the value of any assets transferred to such party on its withdrawal;

and all parties hereto who are participants in the Waste Management Program as of the date of dissolution shall be entitled to share in all of the net assets or net proceeds on a pro rata basis based on each party's relative total capital contribution made to the Waste Management Program during the term of this Agreement."

In accordance with the CTWMB Agreement, the City could withdraw from the agreement, provided notice is given by the identified date, June 1, of the year the City wishes to withdraw. The City would then be bound to the terms of the Agreement until December 31 of the year the City submits its withdrawal request.

2.2 CURRENT RESIDENTIAL RECYCLING PROGRAM COSTS

The City's costs of operating the recycling program are provided below (Table 1). The total cost for the recycling program has varied since 2004, with an average annual cost over the past five years of $89,841. The annual budget includes a CTWMB rebate for the administration of the Southern Node, payment to the CTWMB for the recycling program, service contracts, maintenance materials and supplies, use of the City's equipment, and the cost required for a full-time employee and benefits. Note, in 2008 the City's budget did not include the use of the City's own equipment. The CTWMB rebate for administrative services is $10,000 annually (2005 through 2008). The City's Public Works Operations Manager serves as the administrator. The Public Works Operations Division is responsible for the maintenance of the depots and bins.

Table 1 Recycling Program Costs 2004-2008

Year	Cost	Cost per Household	Cost per Tonne
2004	$83,158[1]	$17.92	$166.65
2005	$92, 240[2]	$19.88	$185.21
2006	$85,282[3]	$18.31[4]	Tonnages NA
2007	$96,407[5]	$20.58[6]	Tonnages NA
2008	$92,119[7]	$19.51[8]	$186.91

In order to compare the City's recycling program costs to the costs of other similar recycling programs within the province, Waste Diversion Ontario (WDO) data collected as part of the Datacall for 2005, 2006, and 2007 was analyzed. Since 2003, WDO annually collects recycling program information from municipalities in Ontario. Each municipality is categorized according to the municipality's size and type of recycling program offered. The CTWMB is included with the "Rural-Depot North" program category. In 2007, 30 municipalities were included in the same category as the CTWMB which provides a good basis for program comparison. It is important to note that the results reported by the WDO are for the entire area within the CTWMB's jurisdiction; data for the City alone was not available from the WDO. Table 2 illustrates the CTWMB's performance for annual recycling program cost per household and per tonne marketed as well as annual depot costs per household.

Table 2 WDO Program Performance Data for Rural Depot North Municipalities

Year	Minimum	Maximum	Median	CTWMB
Net Annual Residential Recycling Program Cost per Household				
2005	$4.02	$70.54	$23.29	$23.30
2006	$4.34	$75.36	$23.48	$23.00
2007	$3.71	$88.21	$25.26	$27.00
Net Annual Residential Recycling Program Cost per Tonne Marketed				
2005	$58.10	$952.50	$321.50	$377.90
2006	$62.30	$967.50	$332.20	$342.50
2007	$68.40	$1082.80	$346.40	$344.30
Total Annual Depot/Transfer Station Costs per Household				

[1] The City of Temiskaming Shores Solid Waste Management Master Plan. Earth Tech (Canada) Inc. March 5, 2008.
[2] The City of Temiskaming Shores Solid Waste Management Master Plan. Earth Tech (Canada) Inc. March 5, 2008.
[3] 2006 City Budget
[4] Number of Households from CTWMB Southern Node Operations "2008" Report
[5] 2007 City Budget
[6] Number of Households from CTWMB Southern Node Operations "2008" Report
[7] 2008 City Budget
[8] Number of Households from CTWMB Southern Node Operations "2008" Report

Year	Minimum	Maximum	Median	CTWMB
2005	$3.90	$63.56	$21.15	$10.80
2006	$4.21	$68.02	$22.57	$11.30
2007	$1.98	$83.65	$20.75	$12.50
Total Annual Recycling Materials Marketed per Household (kg)				
2005	10.3	641.5	74.1	61.6
2006	10.9	267.8	75.0	67.1
2007	3.7	252.5	76.5	78.4

According to the WDO data, the costs for the CTWMB's recycling program in 2005 and 2006 were at the median point of all reported programs. In 2007, the costs were just above the median. The CTWMB's recycling program cost per tonne marketed was above the median in both 2005 and 2006, but dropped just below the median in 2007. For 2005 to 2007, the CTWMB spent well below the median in total annual depot/transfer costs per household. The CTWMB marketed fewer recyclables than the median in 2005 and 2006, but sold slightly more than the median in 2007.

As the City of Temiskaming Shores is considering implementation of a curbside recycling collection program, we have compared CTWMB program costs to those of northern municipal recycling programs that include curbside collection. This information is provided in Table 3.

Table 3 WDO Program Performance Data for Rural Collection North Municipalities

Year	Minimum	Maximum	Median	CTWMB
Net Annual Residential Recycling Program Cost per Household				
2005	$12.89	$58.57	$27.98	$23.30
2006	$10.61	$65.06	$32.97	$23.00
2007	$7.17	$66.38	$32.68	$27.00
Net Annual Residential Recycling Program Cost per Tonne Marketed				
2005	$40.70	$774.10	$198.20	$377.90
2006	$41.70	$752.90	$264.80	$342.50
2007	$45.30	$647.80	$315.00	$344.30
Total Annual Depot/Transfer Station Costs per Household				
2005	$2.38	$38.55	$6.25	$10.80
2006	$0.51	$40.79	$3.73	$11.30
2007	$0.51	$39.44	$7.32	$12.50
Total Annual Collection Costs per Household				
2005	$6.30	$48.20	$22.50	n/a
2006	$6.40	$45.90	$23.90	n/a

Year	Minimum	Maximum	Median	CTWMB
2007	$7.80	$57.10	$26.20	n/a
Total Annual Recycling Materials Marketed per Household (kg)				
2005	24.6	247.7	131.4	61.6
2006	27.3	227.2	116.9	67.1
2007	27.4	244.8	117.8	78.4

Comparison between the Rural Collection North municipalities and the CTWMB illustrates the potential difference between the CTWMB's current program offered in Temiskaming, and potential cost and performance if curbside collection of recyclables is identified as the preferred option.

The median net cost per household for those municipalities with curbside programs is greater than the CTWMB's current cost; however the net cost per tonne marketed is lower as more tonnes of material are managed by programs that offer curbside collection. Municipalities in the North that offer curbside collection of recyclables, capture and market significantly more blue box materials per household than the CTWMB.

Overall, when comparing the CTWMB to other Rural Depot North communities, the CTWMB's recycling program performance is very similar to the median value for all the programs. One exception is the cost per household for depot/transfer stations; while the CTWMB does not have the lowest cost, it is well below the median.

If Temiskaming was to implement a residential curbside collection program, the amount of marketable blue box materials would be expected to rise. It is likely that the cost per tonne for the recycling program would decrease but the cost per household will increase with the addition of curbside collection.

2.3 IC&I RECYCLING PROGRAM COSTS

The IC&I sector in Temiskaming currently has access to very limited municipal recycling services. The IC&I sector is permitted to deliver certain recyclables to the MRF free of charge on specified days. Previously, several premises in the IC&I sector received some municipally funded recycling collection service, however this service was discontinued in 2008.

Up to the end of 2007 the following services were provided:

- The waste collection provider (Phippen)was contracted through the City to collect fibre from downtown IC&I facilities and five New Liskeard schools.
- Collection at each school was $25 which was paid by the City to Phippen.
- Fibre collection from the downtown IC&I facilities was included in the City's annual waste collection contract price, however a breakdown of costs for this service was not available.

- In addition the City's Public Works Department provided some collection services for fibre and other recyclables at several businesses. There was no charge for this service.

In 2007, the City released two reports concerning fibre pick-up at IC&I locations for Council in Committee. The first, dated August 2, 2007, examined the potential costs to expand the downtown existing fibre collection to include all eligible businesses. A set of criteria were established to determine a business' eligibility for the program. The criteria were:

1. Must be a registered business.
2. Limited or non-existent on-site storage space.
3. Located within a designated Town Centre
4. Fibre limit of 1.0m^3 per business per pick up (equivalent to approximately five ½ ton trucks).
5. Collection of Fibre only.

Although a cost proposal from Phippen was not available when the report was sent to Council, City staff estimated the cost per week would be approximately $300 to service the downtown areas of New Liskeard and Haileybury.

A second report to Council in Committee on November 20, 2007 provided estimated costs for a City-wide IC&I fibre collection program. It was estimated that the fee per business (based on a 25% participated rate) would be $2,000 per year or $38.46 per week. The report concluded it is unlikely a participation rate of 25% would be achieved at this fee, and it is likely the 88 businesses currently receiving service in New Liskeard would oppose a fee as less than 25% of businesses use the fibre pick-up service and the average volume generated is 0.6m^3/business. In addition, a private contractor who collects fibre from 35-40 businesses within the City felt that a City sponsored program would jeopardize his business.

As a result of the above noted reports, City Council decided to terminate the IC&I recycling collection services effective January 2008.

2.4 CURRENT DIVERSION RATES

WDO provides a GAP analysis of residential materials diverted and disposed of within the province, based on the information gathered during the annual WDO tonnage datacall. The WDO currently has diversion rates based on the CTWMB 2006 and 2007 datacall information available on its website (diversion rates are shown in Table 4). Since there is no curbside recycling collection program in place in the City and there are no other waste diversion services offered, any waste diverted is primarily related to the existing depot recycling program.

Given that the depot system has not changed significantly since 2004 (i.e., the materials accepted for recycling has not changed), it is assumed the increased diversion rate from 2006 to 2007 is due to greater participation by residents and potentially businesses. It is important to note that the City records all materials as residential materials diverted, however conversations with Phippen and the operating staff for the CTWMB indicate that some IC&I materials are mixed with residential materials. The actual quantity of recyclables generated by residential sources and those that are from the IC&I sector are unknown.

Table 4 WDO Diversion Rates for the CTWMB, 2006 and 2007

Year	Total Reported Single Family Households including Seasonal Households	Reported Population	Total Residential Waste Generated		Total Residential Waste Diverted		Total Residential Waste Disposed		Estimated Residential Diversion Rate
			Tonnes	kg/cap	Tonnes	kg/cap	Tonnes	kg/cap	
2006	19,577	39,728	23,642	595.1	1,418	35.7	22,224	559.4	6.0%
2007	19,587	39,748	11,856.57[9]	298.29	1,743.09	43.85	10113.48[10]	254.44	14.70%

The CTWMB Annual 2008 Annual Report provides a breakdown of the Southern Node municipalities. It is evident in this report that Temiskaming (represented as New Liskeard, Haileybury, and Dymond in the Annual Report) had some of the highest diversion rates in the Southern Node in 2008 (Table 5 and Figure 1).

Overall, it is estimated that a total of 493 tonnes of recyclables was diverted by Temiskaming in 2008. A total of 409 tonnes of paper fibre, 18.4 tonnes of plastics, 16.7 tonnes of metals and 49 tonnes of glass generated within the City were estimated as being diverted.

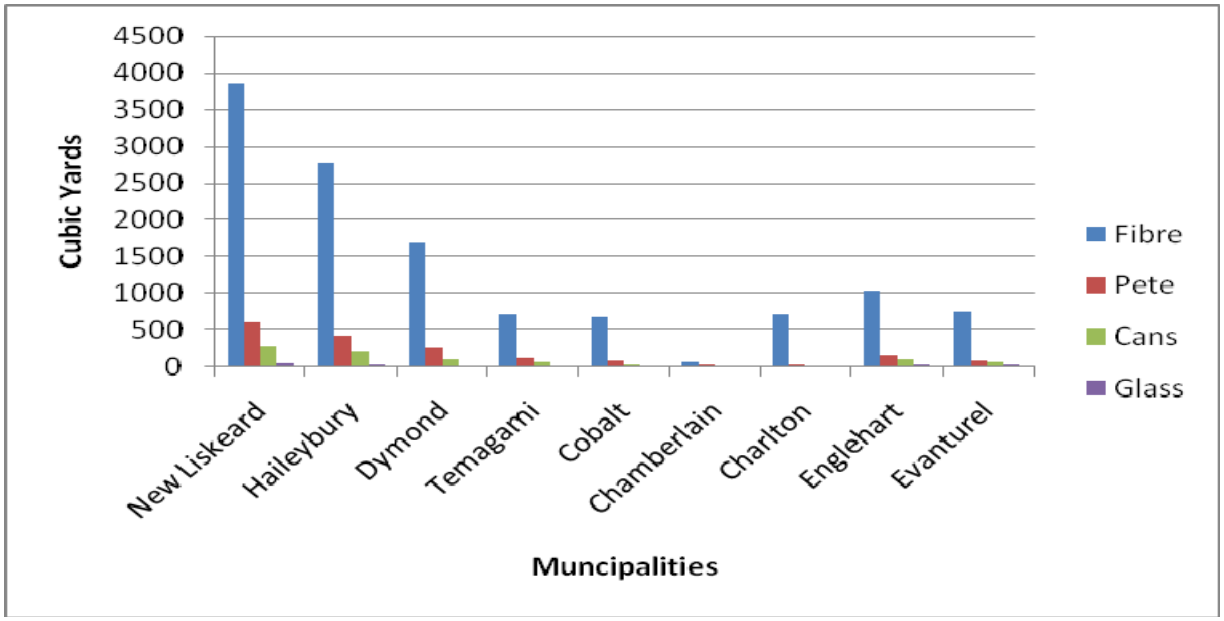
[9] Includes calculated garbage tonnes based on Municipal Group average for municipalities not reporting garbage tonnes, municipalities reporting partial garbage tonnes and municipalities reporting estimated garbage tonnes.

[10] Includes calculated garbage tonnes based on Municipal Group average for municipalities not reporting garbage tonnes, municipalities reporting partial garbage tonnes and municipalities reporting estimated garbage tonnes.

Table 5 2008 Recycling Summary, Southern Node

	New Liskeard	Hailey-bury	Dymond	Temag-ami	Cobalt	Chamber-lain	Charlton	Engle-hart	Evan-turel
Fibre (yds^3)	3857	2786	1680	716	676	79	722	1039	753
Pete (yds^3)	602	424	262	130	89	28	35	162	86
Cans (yds^3)	278	205	119	79	46	21	23	107	65
Glass (yds^3)	42	22	9	11	8	4	8	20	16
Totals (yds^3)	4779	3438	2080	935	819	132	188	1328	920
Cubic Yards/ Household	**2.14**	1.76	4.53	1.90	1.30	0.83	0.68	1.79	4.46

Figure 1 2008 Southern Node Diversion Rates by Material



2.5 RECYCLING IN THE RESIDENTIAL SECTOR

The City of Temiskaming Shores currently provides a depot style recycling program to the residential sector. Residents deliver their recyclable material to one of eight (8) drop-off depots located within the City (three in Haileybury, three in New Liskeard, and two in Dymond). Each municipality owns their depots and they are responsible for the maintenance and general clean-up around them. Figure 2 illustrates the location of the recycling depots as well as other waste management facilities within the City.

Currently, materials accepted at the recycling depots include paper fibres (old newsprint, old corrugated cardboard, old boxboard, and residential mixed paper), aluminum and steel cans, clear

and coloured glass containers, and No.1 (PET) plastic. Recyclable materials are collected in four bins, including one for paper fibres, one for cans, one for glass, and one for PET plastic (Table 6).

Table 6 Container Volumes

Haileybury & Dymond		New Liskeard	
Fibre	12 yd^3	Fibre	18 yd^3
Cans	4 yd^3	Cans	4 yd^3
PET plastic	6 yd^3	PET plastic	6 yd^3
Glass	2 yd^3	Glass	2 yd^3

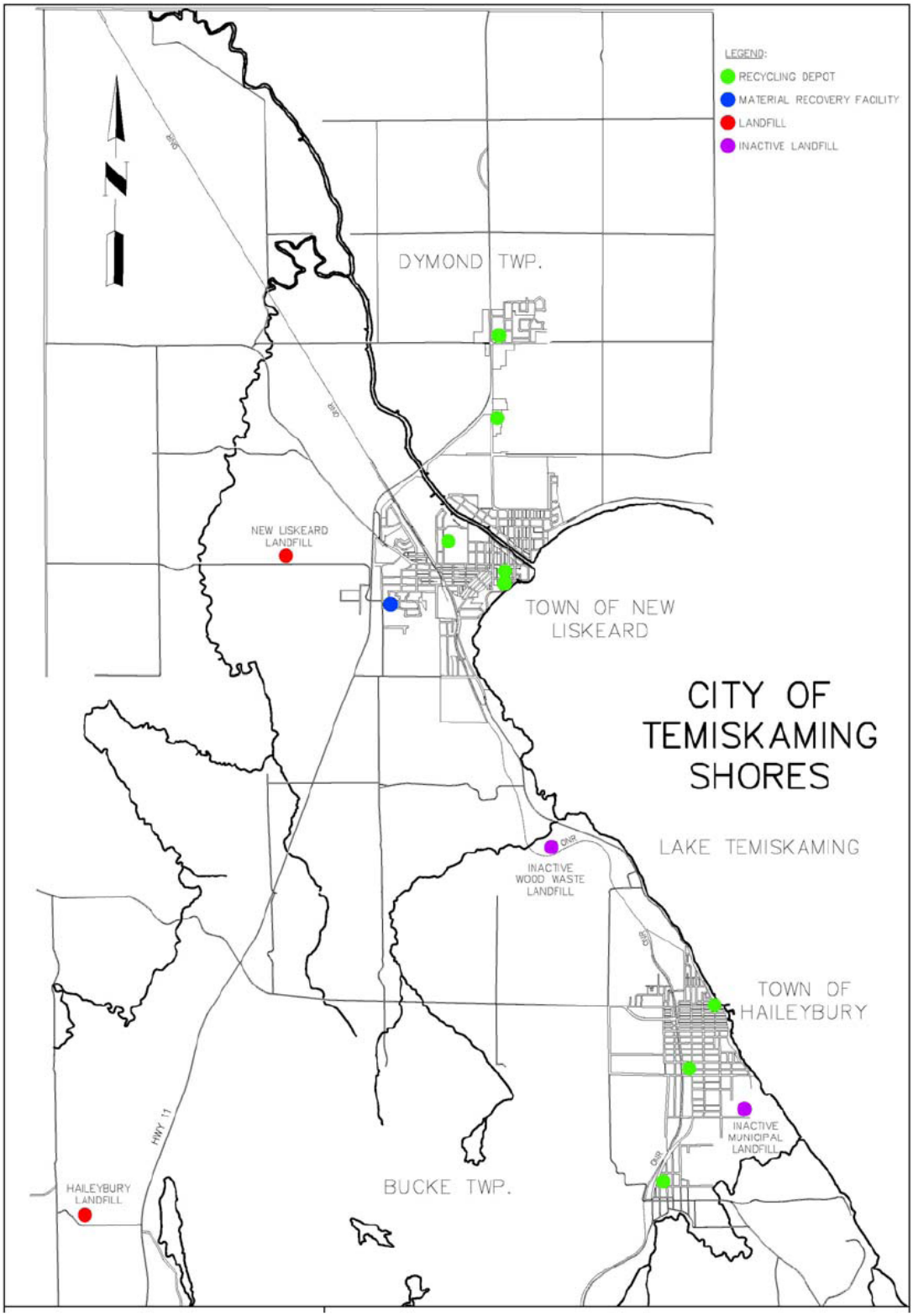
Recyclable materials from the depots are collected on Monday, Wednesday, Thursday, and Friday[11] and then delivered to the material recovery facility (MRF) located on Barr Drive where the material is sorted and consolidated. Presently, recyclable material at the MRF is processed every Tuesday. MRF staff is responsible for the sorting, compacting, and baling of marketable recyclable materials. Materials are sorted in the following manner: metals cans are sorted into steel and aluminum cans; fibre is sorted into old newsprint, old corrugated cardboard, old box board and residential mixed paper; and plastics are sorted into PET plastic and mixed plastic.

Although there are markets for both PET plastic and mixed plastics, the depots are not designed to receive mixed plastics and the MRF is not capable of accommodating large quantities of the mixed plastic. Therefore, the City does not advertise the recycling of any plastic other than the PET plastic. Nevertheless, mixed plastics are received at the depot and the City has successfully been marketing these plastics to a company in Hamilton. The company provides haulage services and pays a fee to the City for the mixed plastics. It has also been observed that a large volume of No. 2 plastic (HDPE) is also being included in the recycling stream because residents are not separating them out. In the same way to mixed plastics, the depots and MRF do not have sufficient capacity to manage the volume of HDPE plastic currently being produced by the City, and therefore the City does not advertise for their inclusion in the recycling program.

There is no current market for the clear and coloured glass. Currently this material is being disposed at the Haileybury landfill.

[11] Monday – fibre pick-up. Wednesday – PET plastic and metal pick-up. Thursday – another fibre pick-up but not to outlying areas. Friday – fibre pick-up and glass pick-up. There are no scheduled pick-ups on Tuesday, as Tuesday is a sorting, bundling, and catch-up day at the MRF.

Figure 2 Location of the Drop-Off Depots, Landfills, and the MRF



2.6 RECYCLING IN THE IC&I SECTOR

In order to provide some level of service to the IC&I sector, the City provides IC&I businesses with the opportunity to bring recyclable material directly to the MRF. The IC&I sector has been provided with notices identifying which days they can bring specific products to the MRF free of charge; whereas, if they delivered the material to the landfill they would have to pay tipping fees. Some IC&I businesses have been known to also use the public depots which reportedly contributes to their overloading.

As of 2007, there were approximately 337 IC&I facilities within the City that could be anticipated to generate waste. The following table (Table 7) categorizes each of the IC&I facilities. The information was provided to the City's finance department by the Municipal Property Assessment Corporation (MPAC).

As discussed in Section 2.7.3, it is understood that four (4) large retailers recycle and market their own OCC, approximately twenty two (22) businesses drop off recyclables at the MRF and in the order of six (6) or more businesses use private collection services to divert their recyclables. However, by far the majority of IC&I facilities (approximately 323) are understood to have limited to no recycling program.

Table 7 IC&I Facilities

Commercial Category Description	No.	Industrial Category Description	No.
105 – Vacant Commercial Land	142	106 – Vacant Commercial Land	52
400 – Small Office Building	26	501 – Mines – Inactive, including properties where closure plans invoked. - n/a	2
402 – Large Office Building	8	510 – Heavy Manufacturing (non-automotive)	3
403 – Large Medical/Dental Building	2	520 – Standard Industrial Properties not Specifically identified by other Industrial	17
405 – Office Use Converted from House	1	523 – Grain Handling – Primary Elevators	3
408 – Freestanding Beer Store or LCBO	3	530 – Warehousing	14
409 – Retail – 1 Storey over 10,000 ft^2	4	531 – Mini Warehousing	2
410 – Retail – 1 Storey under 10,000 ft^2	42	540 – Other Industrial (not specifically defined)	20
411 – Restaurant – Conventional	7	558 – Hydro One Transformer Station – n/a	6
412 – Restaurant – Fast Food	2	561 – Hydro One Right-of-Way – n/a	8
413 – Restaurant – Conventional, National Chain	1	588 – Pipelines – Transmission/Distribution – n/a	5
414 – Restaurant - Fast	4	590 – Water Treatment/Filtration/Water Towers/Pumping Stations – n/a	8
415 – Cinema/Movie House/Drive-in	2	593 – Gravel pit, quarry, sand pit	13
420 – Automotive Fuel Station with or without Service Facilities	8	597 – Railway Right-of-Way – n/a	3

Commercial Category Description	No.	Industrial Category Description	No.
421 – Specialty Automotive Shop/Repair	58	598 – Railway Buildings	1
422 – Auto Dealerships	6		
423 – Auto Dealerships – Independent or Used	1		
426 – Small Box Shopping Centre less than 100,000 ft^2	1		
429 – Community Shopping Centre	1		
430 – Neighbourhood Shopping Centre with more than two stores less than 150,000 ft^2	4		
432 – Banks and Similar Financial Institutes less than 7,500 ft^2	2		
433 – Banks and similar Financial Institutes greater than 7,500 ft^2	2		
434 – Freestanding Supermarket	1		
436 – Freestanding Large Retail greater than 30,000 ft^2	1		
441 – Tavern/Public House/Small Hotel	4		
444 – Full Service Hotel	2		
445 – Limited Service Hotel	1		
450 – Motel	5		
451 – Seasonal Motel	1		
471 – Retail or Office with Residential units less than 10,000 ft^2 – Older Downtown Core	52		
472 – Retail or Office with Residential units greater than 10,000 ft^2 – Older Downtown Core	4		
473 – Retail with more than one non-retail use	3		
477 – Retail with Office – less than 10,000 ft^2 with office above	1		
478 – Retail with Office – greater than 10,000 ft^2 with office above	1		
482 – Surface Parking Lot – used in Conjunction with another property	2		
487 – Billboard – n/a	n/a		
490 – Golf Course	2		
492 – Marina located on waterfront	2		
495 – Communication Towers – n/a	n/a		
496 – Communication Buildings – n/a	n/a		
625 – Nursing Home	2		
626 – Old Age/Retirement Home	1		
705 – Funeral Home	2		
710 – Recreation Sport Club	3		
720 – Commercial Sport Complex	1		
735 – Assembly Hall, Community Hall	3		

Commercial Category Description	No.	Industrial Category Description	No.
736 – Clubs, Private, Fraternal	2		
805 – Post Office or Depot	1		
Total (excluding Vacant Land and n/a)	282	Total (excluding Vacant Land and n/a)	73
Total potential waste generators	280	Total potential waste generators	57

2.7 KEY ISSUES WITH CURRENT RECYCLING SYSTEM

There are a number of issues that the City currently faces in regards to its recycling program. Some of the key issues are listed below.

2.7.1 Material Recycling Facility (MRF) Capacity

The MRF that the City administers on behalf of the CTWMB is currently operating at maximum capacity. Lack of MRF capacity is a significant issue as the City desires to expand its current recycling system to divert additional materials from landfill (i.e., No. 2 HDPE etc.). MRF capacity expansion is vital to extending the operating life of both the New Liskeard and Haileybury landfills as well as helping the City get closer to reaching its goal of 60% diversion as identified in its Solid Waste Management Master Plan.

Expansion of the current MRF is limited significantly due to its location. The MRF is located at 547 Barr Drive in New Liskeard. The facility itself is owned by the CTWMB, while the land is owned by New Liskeard. The MRF cannot be easily expanded due to site constraints related to the presence of housing developed in the vicinity. Residential housing is considered a sensitive land use by the MOE. Therefore, it is not considered viable to expand the current MRF.

There are a limited number of other MRFs within a reasonable distance. Table 8 provides a summary of the nearest MRFs. The nearest MRF is located in Sturgeon Falls and is approximately 156 km from the City. However, this MRF is a small, municipally owned and operated facility that is already at capacity, and would not be a viable option for receiving additional materials from the City.

Located 159 km from the City, the privately owned MRF in North Bay is restricted to receiving waste from North Bay in its Certificate of Approval (CofA). In 2007, the MRF was already reportedly at capacity[12]. Therefore, North Bay is also an unlikely candidate for receiving additional materials. The potential costs associated with utilizing a neighbouring municipality's MRF increases with distance, due to increases in haul costs. Further options and analysis regarding transfer of recyclables to a MRF located outside of Temiskaming is discussed in Section 6.3.5.

[12] Entech Consulting Ltd. 2007. Report on Ontario Blue Box Material Recovery Facilities. Prepared for: Waste Diversion Ontario.

Table 8 Location of MRFs in the Proximity of the City of Temiskaming Shores

Location	Municipally or Privately Owned	Address	C of A No.	Area Restrictions	Tonnage Restrictions	Distance from New Liskeard
Sudbury	Municipal	1825 Frobisher Street	A540231	Ontario	70 tpd; 31,200 tpy	219 km
Sturgeon Falls	Municipal	219 O'Hara Street	No C of A	Receives recycling from East Ferris and West Nipissing	At capacity	156 km
Blind River	Private – Municipal Waste Recycling Consultants	9 Industrial Road	No C of A	Receives waste from Blind River, Central Manitoulin, Elliot Lake, Espanola, Huron Shores, Township of Johnson, Northeastern Manitoulin, Town of Spanish, Tarbutt & Tarbutt Additional, TRI-Neighbours		390 km
North Bay	Private – Miller Waste Systems	112 Patton Street	A530114	North Bay	250 tpd	159 km
Sault Ste. Marie	Private – Green Circle Environmental	11 White Oak Drive East	Yes	Ontario	100 tpd; permitted 300 tonnes in storage	533 km
Timmins	Private – Waste Mgt. Corp. of Canada	278 Feldman Road	4458-5QTLS3	Ontario and Quebec	100 tpd; permitted 150 tonnes in storage	210 km
Timmins	Private – Miller Waste Systems	n/a	Yes	Ontario	Permitted 100 tonnes in storage	~200 km
Ottawa Valley Waste Recovery Centre (OVWRC)	Municipal	900 Woito Station Road	411601	Ontario	8,000 tpy	394 km
Ottawa	Private – Metro	2811	A710151	Winnipeg,	500 tpd;	522 km

Location	Municipally or Privately Owned	Address	C of A No.	Area Restrictions	Tonnage Restrictions	Distance from New Liskeard
	Waste Recycling	Sheffield Road	3460-4UTUR8	Ontario, Montreal	permitted 1,500 tonnes of processed, unprocessed and residual; 300 tonnes of unprocessed and residual.	
Armour	Municipal	n/a	A521003	n/a	n/a	247 km
Rouyn-Noranda, Quebec	Private	220 Marcel Baril Avenue	n/a	Abitibi-Témiscamingue	n/a	138 km

2.7.2 Recycling Depot Capacity

There are currently eight drop-off depots located in Dymond, New Liskeard, and Haileybury. Dymond hosts two depot locations, one at the Municipal Hall and another at Temiskaming Square. The New Liskeard depots are situated at a grocery store parking lot, at a downtown parking lot and at an arena parking lot. Haileybury has three depots located beside the Haileybury Water Treatment Plant, at the Haileybury Mall and at a variety store.

The depots are easily identifiable and well labeled as to which materials belong in each bin (Figure 3). There are two bins for fibre, one for plastic and one bin for both glass and cans. The New Liskeard depots have an extra fibre bin. The volumes of the containers at the depots are as follows.

Haileybury & Dymond		New Liskeard	
Fibre	12 yd^3	Fibre	18 yd^3
Cans	4 yd^3	Cans	4 yd^3
PET plastic	6 yd^3	PET plastic	6 yd^3
Glass	2 yd^3	Glass	2 yd^3

Figure 3 Example of a Recycling Depot

Similar to the issue with MRF capacity, the eight (8) drop-off depots located throughout the City were operating at capacity until recent expansions. Over the past couple of years, the City has increased the size of the recycling container receptacles (to collect additional fibre and no. 1 plastic materials) at the depots but these containers are now the largest that could fit at the current depot sites. The City's Public Works Department also purchased two used recycling trucks from the CTWMB to increase the level of service at the depot, by using these vehicles to empty the paper fibre and OCC bins during peak use in the summer. Even with this recent expansion and more frequent removal of materials at peak periods, residents often complain that the depots are 'full' and they often have to travel to more than one depot to deposit all of their recyclables. Other residents have been known to just leave the materials on the ground beside the bins creating an aesthetically unpleasing situation.

Data collection sheets from City staff indicate the depot bins are often well below capacity. The perception that the bins are often full is likely due to the design of the bins where recyclables are easily deposited in the front portion, but require the user to push the materials to the back of the bin to fill available space. For corrugated cardboard collection, some users reportedly do not break down boxes and instead attempt to deposit an entire box in the bin or simply leave the box outside of the bin on the ground. In order to better use available capacity in the bins, the issue may be one of education whereby users recognize the importance of properly collapsing cardboard boxes and pushing materials to the back of the bins when they deposit them.

There have also been issues with the public using the depots as a dumping ground for non-recyclable wastes. Based on the design of the depot bins, the waste collection vehicle approaches

the bin from the front and the recyclables are deposited in the rear of the bin. The depots are situated in inconspicuous locations in parking lots throughout the City. The design and locations of the bins makes it convenient for the public to leave their garbage near the bins. CTWMB and/or City staff must then collect and sort through the garbage.

2.7.3 Non-Uniform Level of Service

Due to the depot-style of the recycling program, the level of service offered by the recycling program depends on how close a resident lives to a depot, the availability of depot capacity, and whether the resident is able to transport their recyclable materials to the depot (particularly elderly or handicapped individuals).

Although there are eight (8) depots located throughout the City, some residents still need to travel fairly significant distances to reach a depot and drop off their recyclables if they live in more rural areas. The issues surrounding having residents transport their recyclables to depots are amplified for elderly and handicapped individuals who may not have the ability to bring their recyclables to a depot at all. In addition, as mentioned previously, the current depots often appear to be at capacity, forcing residents to travel from depot to depot to drop off their materials or just drop them in an inappropriate location. The City would like to investigate the feasibility of introducing a curbside recycling collection program to assist in increasing the level of service to the community.

Collection of recyclables from downtown areas was once provided through the City. However, the City has since stopped providing any recycling services to the IC&I sector. In order to recycle, the IC&I sector either enters into agreements with private sector waste management companies to collect their recyclable materials, or hauls their materials to the MRF themselves. According to CTWMB staff, approximately 22 businesses haul their recyclables directly to the MRF. On average, each business hauls two, half-tonne truck loads of material (primarily OCC and paper fibre) to the plant each week. Both Phippen and one other service provider offer recycling services to the IC&I sector. At least 6 businesses are known to use Phippen's service. Certain larger retail businesses (Canadian Tire, Food Basics, Zellers and Walmart) are also known to bale and sell their own OCC to the recycling market.

The remaining businesses either use the depots intended for used by the residential sector or place their recyclable materials in with their regular garbage. As a result, a significant portion of the waste currently being sent to landfill consists of recyclable materials.

2.7.4 Geographic Issues

The City of Temiskaming Shores is located in Northeastern Ontario and is quite isolated from recycling markets which are located further to the south. This presents the City with the challenge of finding buyers for the recyclable materials. Currently transportation costs are too cost prohibitive to

return certain materials to market. Glass is currently not being marketed due to the increased cost to manage this material. Geography is also an issue in regards to pursuing options to transfer/haul materials to other processing locations, which are some distance from the City.

2.8 REVIEW OF RECYCLING PROGRAMS

Within the Province of Ontario, there are vast differences in the types of recyclable materials collected by different municipalities. Further, the method by which municipalities provide for the collection of recyclable materials (i.e., curb-side collection vs. depot collection) varies throughout the province. A recent study completed by Stantec for the Stewardship Ontario Blue Box Recycler Training Program involved a review of all blue box performance data from the Province of Ontario. The study reviewed recycling data call information provided by municipalities to WDO from 2005 to 2007. Key findings related to the types of common recyclable materials are discussed below.

The Study identified 17 common recycling material types in the province, including:

- Old Newspaper (ONP);
- Glass (clear and coloured);
- Aluminum cans;
- Steel cans;
- PET plastic containers;
- Old corrugated containers (OCC);
- Old boxboard (OBB);
- Gable top containers;
- Aseptic cartons;
- Aluminum foil;
- Empty aerosol cans;
- Empty paint cans;
- HDPE plastic containers;
- Other bottles;
- HDPE/LDPE plastic film,;
- Tubs and lids; and,
- Polystyrene containers.

The Study indicated that municipalities in Ontario provided for the collection of an average of 13 of the above listed materials (median of 14) materials with some municipalities collecting all 17 and some collecting as few as 7. The most common materials collected (in addition to the five materials

required under provincial regulations being: ONP, glass, aluminum cans, steel cans and PET plastic containers) were OCC, OBB, HDPE plastic containers, aluminum foil, tubs and lids, other bottles, gable top cartons, and aseptic cartons. Currently the City of Temiskaming Shores is collecting 7 of the above listed materials including Mixed Paper Fibres, OCC, OBB, PET plastic, glass (clear and coloured), steel cans, and aluminum cans. The City is currently collecting significantly fewer materials than the provincial average.

Many municipalities located in Northern Ontario face similar challenges in regards to operating a recycling program (i.e., distance from markets, harsh climate, large service areas, small populations). Table 9 compares the community characteristics, type of recycling service and the types of recyclable materials managed by the recycling program in Temiskaming Shores, North Bay, Timmins, Kirkland Lake, and Elliot Lake.

In regards to the materials accepted, the recycling program offered by the City of Temiskaming Shores is relatively comparable to other municipalities of similar size and geography, with the primary difference being the types of plastics and other containers accepted.

While Temiskaming may have a smaller population base than some of the other municipalities, the overall population density in Temiskaming is higher than in most of the other northern communities that provide curbside recycling collection service. It appears reasonable for Temiskaming to consider a transition to curbside recycling collection and potential expansion of the recyclable materials accepted in order to increase municipal diversion rates.

Table 9 Overview of Recycling Programs

Municipality	Population	Population Density per km^2	Collection Service	Materials Accepted	Total Number of Materials Accepted
City of Temiskaming Shores	10,442	60.6	Depot 493 tonnes (2008) Gross cost per tonne $187 (2008)	Mixed Paper Fibres (including ONP) OCC OBB Steel Cans Aluminum Cans PET Plastic Glass Containers	**7**
North Bay	53,966	171.4	Curbside 3,800 tonnes (2007) Gross cost per tonne	ONP OCC OBB Aluminum Cans Steel Cans Aluminum Foil and Plates PET Plastic	**12**

Municipality	Population	Population Density per km^2	Collection Service	Materials Accepted	Total Number of Materials Accepted
			$246 (2007)	HDPE Plastic Glass Gable top Containers Aseptic Containers	
Timmins	42,455	14.5	Curbside 2,730 tonnes (2007) Gross cost per tonne $128 (2007)	ONP OCC OBB Aluminum Cans Steel Cans Glass PET Plastic HDPE Plastic	**8**
Elliot Lake	11,549	16.5	Curbside 606 tonnes (2007) Gross cost per tonne $142 (2007)	ONP OCC OBB Glass Aluminum Foil Aluminum Cans Steel Cans PET Plastic HDPE Plastic	**9**
Kirkland Lake	8,248	31.5	Curbside 288 tonnes (2007) Gross cost per tonne $479 (2007)	Glass Steel Cans Aluminum Cans PET Plastic OCC OBB ONP	**7**
Township of Amaranth	3,845	14.5	Depot 300 tonnes (2007) Gross cost per tonne $193 (2007)	ONP OBB OCC Glass Aluminum Cans Steel Cans PET Plastic HDPE Plastic LDPE Plastic PP Plastic Polystyrene	**11**
Township of	385	4.8	Depot	OCC	**8**

Municipality	Population	Population Density per km^2	Collection Service	Materials Accepted	Total Number of Materials Accepted
Casey			30.4 tonnes (2007) Gross cost per tonne $109 (2007)	ONP OBB PET Plastic Aluminum Cans Steel Cans Clear glass Coloured glass	

3.0 Applicable and Pending Recycling Legislation

The recycling system in Ontario is regulated under the following: Regulation 101/94, the Waste Diversion Act, and Regulation 273/02. These regulations and pending amendments to current recycling legislation are discussed below.

3.1 REGULATION 101/94

Ontario Regulation 101/94 outlines municipal responsibilities with respect to blue box recycling systems in Ontario. These requirements pertain to collection methods/frequency, materials being recycled, promotion and reporting.

Regulation 101/94 requires that Northern Ontario municipalities with a population in excess of 15,000 establish, operate and maintain a blue box recycling system which services all residential buildings receiving municipal waste collection. The frequency of blue box collection must be at least half the frequency of municipal waste collection. Northern Ontario municipalities with a population between 5,000 and 15,000 must provide their residents with blue box recycling service but the collection frequency does not have to be half the frequency of waste collection. Instead, Regulation 101/94 requires Northern Ontario municipalities with populations between 5,000 and 15,000 provide for the collection or acceptance of blue box waste in a manner that is “reasonably convenient” to the residents of the community. Regulation 101/94 does not define what is meant by “reasonably convenient” and as a result, the City of Temiskaming Shores, with a 2006 population of 10,732, has the option to choose to provide depot or curbside service.

Regulation 101/94 requires municipalities that operate blue box recycling systems to include the following materials in their recycling programs:

- aluminum cans
- glass bottles/jars

- newsprint
- #1 PETE plastic
- steel (tin) cans

In addition, it also requires municipal blue box recycling programs to include at least two (2) of the following seven (7) items:

- aluminum foil
- boxboard
- cardboard
- expanded polystyrene food and beverage containers
- fine papers
- magazines
- paper cups/plates

The City's recycling program complies with Regulation 101/94 in terms of materials which must be recycled, as listed: 1) Paper Products - newspaper, magazines, computer paper, pamphlets, flyers, envelopes, and writing paper; 2) Cardboard/Boxboard - cereal boxes, old corrugated cardboard, tissue boxes, soap boxes, and shoe boxes; 3) Aluminum/Steel Cans; 4) Glass Jars and Bottles; and 5) Plastic Containers (PET).

Regulation 101/94 also requires that municipalities provide users of blue box recycling systems with information on the performance of the system and encourage the public to participate in its use. Finally, Regulation 101/94 requires municipalities operating a blue box recycling system to submit an annual report on the system's performance to the MOE on or before June 1 of each year.

3.2 WASTE DIVERSION ACT

The *Waste Diversion Act* (WDA) was passed into law on June 27, 2002. The purpose of the WDA is to promote the reduction, reuse and recycling of waste in Ontario and to provide for the development, implementation and operation of waste diversion programs.

The Minister of the Environment may designate a material through a regulation under the WDA and request that Waste Diversion Ontario (WDO) develop a diversion program for the designated material. The Minister has designated Blue Box Wastes, Used Tires, Used Oil Material, Waste Electronic and Electrical Equipment (WEEE) and Municipal Hazardous or Special Waste (MHSW). When designating MHSW, the Minister set aside the Used Oil Material designation and included used oil filters and oil bottles in the MHSW designation.

WDO, working co-operatively with an Industry Funding Organization (IFO), responds to the Minister's request by developing a diversion program plan and submitting it to the Minister for approval. After the Ministry of the Environment posts the plan on the Environmental Registry website for a minimum of 30 days for comment, the Minister will approve or reject the plan. If approved, the Minister files a regulation under the WDA designating the IFO as the organization responsible for implementing the approved plan, with authority to collect fees from industry stewards to cover implementation costs, administer the IFO, and contribute to the costs of WDO.[13]

As noted in Section 1.3.2 below, the WDA is currently under review, and significant changes to the WDA and the diversion programs under the Act are likely in the very near future.

3.2.1 Blue Box Program Plan and Regulation 273/02

On September 23, 2002 the Minister requested that WDO develop a diversion program for Blue Box Wastes. In response, WDO created an IFO for Blue Box Wastes, called Stewardship Ontario. Stewards of Blue Box Wastes, defined as brand owners and first importers in the Minister's program request to WDO, can fulfill their financial obligations under the WDA either through membership in Stewardship Ontario or by implementing their own plan, called an Industry Stewardship Plan (ISP) 6, with approval from WDO.

Stewardship Ontario, in consultation with industry stewards and interested stakeholders, developed the Blue Box Program Plan (BBPP). The Plan further defines Blue Box Wastes as consumer packaging material and printed papers commonly found in the residential waste stream. The goal of the BBPP is to increase the diversion of municipal Blue Box materials in an economically sustainable manner.

Under the BBPP, stewards are invoiced by Stewardship Ontario for the following costs:

- Payments to municipalities (outlined in Section 4.1); and
- Direct program delivery, market development and program administration costs (outlined in Section 4.2).

Blue Box Wastes were designated under the WDA by regulation O. Reg. 273/02 on September 23, 2002. For the purpose of the Act, the regulation defines Blue Box Wastes as: Waste that consists of any of the following materials, or any combination of them:

- Glass;
- Metal;
- Paper;
- Plastic;

[13] Guide to the Blue Box Program, Waste Diversion Ontario, October 17, 2007.

- Textile.

3.3 PROPOSED AMENDMENTS TO THE BBPP

In April 2009, Waste Diversion Ontario released a report entitled "Blue Box Program Plan Review Report and Recommendations" [14] This review was requested by the Minister of the Environment on October 16, 2008.

The Minister directed WDO to undertake the BBPP review using the principles of extended producer responsibility to form the review framework. Specifically, the Minister wanted to address the following ten identified issues:

- Program Performance

  The BBPP has reached its 60% waste diversion target. A new target may encourage further increases in waste diversion. Recommend a new target for the next 5 years of the BBPP that goes beyond the 60% target originally set for the 2004-2008 period.

- Material Specific Performance

  Certain Blue Box wastes are not achieving high diversion rates (e.g., plastics), and may benefit from material-specific diversion targets. Recommend material-specific diversion targets for Blue Box wastes to encourage further increases in waste diversion for the next 5 years of the BBPP.

- Consistency Across Municipalities

  The collection of different Blue Box wastes across Ontario municipalities creates public confusion. Recommend how the program can achieve greater consistency in the Blue Box wastes that are collected across Ontario municipalities to minimize public confusion, facilitate province wide communication and outreach activities, and encourage further increases in waste diversion for the next 5 years of the BBPP.

- Problematic Wastes

  Some Blue Box or non-Blue Box wastes create operational inefficiencies for municipal recycling programs and may increase costs. Recommend how problematic Blue Box and non-Blue Box wastes can be addressed through the BBPP or other mechanisms.

- Blue Box Wastes from the IC&I Sector

  The industrial, commercial and institutional (IC&I) sector generates more designated Blue Box wastes than the residential sector, but is not included in the BBPP. Recommend if, and how, the BBPP could be extended to include Blue Box wastes generated by the IC&I sector.

- Blue Box Wastes Collected Outside of the Blue Box

  Blue Box wastes not captured in the Blue Box are collected as garbage or litter by municipalities, fully at their cost. Recommend (1) how collection options beyond municipal curbside and depot could be used to increase collection of Blue Box wastes and (2) how

[14] Blue Box Program Plan Review Report and Recommendations, Waste Diversion Ontario, April 2009.

steward responsibility can be used to address Blue Box wastes that are collected beyond municipal curbside and depot, or disposed as waste or litter.

- Additional Blue Box Wastes

  Some of the designated Blue Box wastes, such as plastic products, are not included in the BBPP. Recommend how the BBPP can be expanded to include additional wastes already designated by regulation within the program.

- Environmentally Responsible Management

  There are concerns that some Blue Box wastes may not be managed in an environmentally responsible manner, including waste marketed in Ontario or sent offshore. Recommend mechanisms that can be added to the BBPP to assure that Blue Box wastes are managed in an environmentally responsible manner from collection to final market.

- Stewardship Fees

  Current steward fees for certain Blue Box wastes may be too low to encourage either increased waste diversion or the use of materials in product manufacturing or packaging that can be easily recycled. Recommend how the steward fee structure can be revised to (1) increase the waste diversion rate for certain Blue Box wastes (e.g., plastics) and (2) encourage stewards to incorporate materials that are easily recycled into their products or packaging.

- EPR Funding

  The BBPP does not reflect full Extended Producer Responsibility (EPR) funding since the WDA requires Blue Box stewards to fund 50% of municipal program costs, with municipalities funding the rest. Recommend how to move the BBPP towards full EPR funding.

  Since different collection and processing systems for Blue Box wastes are the result of decisions made by local municipalities, in your review and recommendation, please consider the potential impact to the management of municipal recycling programs as industry moves to full EPR funding.

The review resulted in 20 recommendations under each of the ten (10) issues that were identified by the Minister of the Environment. These recommendations were meant to provide direction for future modifications to the BBPP in Ontario. The overall theme of the paper was a move from the current funding model (50% by stewards) to a full EPR funding model (100% funded by stewards) for recyclable materials. Should the province move forward with a full EPR based system, the onus of funding (and possibly operating) recycling programs in Ontario will move from municipalities to stewards which would financially benefit municipalities such as the City of Temiskaming Shores

3.4 PROPOSED AMENDMENTS TO THE WDA

In October 2008 the Ministry of the Environment (MOE) began a review of the Waste Diversion Act (2002). The purpose of the review was to investigate issues affecting waste diversion and to

contemplate using the principles of Extended Producer Responsibility (EPR) as the basis for Ontario's waste diversion framework.

The results of the review are provided in *"From Waste to Worth: The Role of Waste Diversion in the Green Economy"*, issued by the MOE in October 2009.

During the six month review period, the MOE met with 200 stakeholders and members of the public representing all of Ontario's regions and a wide variety of interests. In addition, the MOE met with over 30 stakeholders and stakeholder groups. Approximately 200 comments were received in response to the Environmental Registry posting providing the MOE with feedback on methods to improve Ontario's waste diversion framework. The *From Waste To Worth* report summarizes the feedback as:

- "Focus on outcomes rather than process.
- Give businesses flexibility to suit their needs – avoid a one-size-fits all approach.
- Provide a long-term plan (materials and timelines) – avoid ad hoc material designations and program requests.
- Clean up governance – remove overlap in roles and responsibilities.
- Provide assistance o businesses to help them understand and meet their obligations.
- Make disposal more difficult and costly – provide incentives for diversion."

Based on comments and opinions from the consultation period, the MOE established four broad outcomes to guide any changes to the waste diversion framework. These are:

- Increased waste diversion;
- Innovations in sustainable product and packaging design;
- Investments in green processes and technologies to grow Ontario's reuse and recycling sector; and,
- Opportunities for all Ontarians to meaningfully participate and contribute to increasing waste diversion."

The MOE further believes the framework should be guided by the vision of zero waste and follow a set of principles including responsibility, flexibility, accountability, transparency, competition and predictably. Based on these principles and the outcomes stated above, the MOE has proposed several changes to the waste diversion framework. Details on the changes are summarized below.

Outcomes-based Individual Producer Responsibility

The WDA currently provides direction on the roles and responsibilities of the Minister of the Environment, Waste Diversion Ontario (WDO), and Industry Funding Organizations (IFOs). One of the main issues with the current framework is that the burden of waste management falls to the municipality who must provide waste disposal facilities and fund the capital and operating costs

associated with such facilities. A full producer responsibility system requires the producers of packaging and products to subsidize waste diversion. Stakeholders thought an outcome based system would allow each individual producer to select an approach most applicable to their business. The approach could be the development of their own waste diversion plan or by joining with several businesses to develop a plan that works on a larger scale. Based on the identification of these issues, the MOE proposes the following:

- Making individual producers fully responsible for meeting waste diversion requirements.
- Allowing individual producers to meet their waste diversion requirements either by joining a materials management scheme or by developing their own individual waste diversion plan.
- Requiring individual producers to annually report information on sales into the Ontario marketplace of designated products and packaging.
- Requiring that any waste diversion plan must meet outcome-based plan requirements including:
    - Material –specific waste diversion targets set out in regulation under the WDA.
    - Management of wastes in accordance with the concept of diversion.
    - Providing for tracking of material from collection to final destination, including identification of markets and end-uses of collected material.
    - Providing for consumer convenience and accessibility through establishment of minimum service standards that must be met where products are sold in Ontario.
- Requiring producers who fail to meet outcome-based requirements to meet prescriptive requirements set out in regulation."

Clarify the Concept of Diversion

The WDA encourages waste reduction, reuse, and recycling and prohibits programs which promote burning, landfilling or land application of designated materials. Stakeholders reportedly called for greater clarification on what activities constitute diversion and can count towards diversion targets. New and innovative processes and technologies are not promoted within the Act, which may prevent Ontario companies from researching and investing in new technologies that can recover materials.

The Ministry proposes:

- "Clarifying the concept of diversion to recognize that a wider range of processes and technologies could be used to meet diversion requirements and encourage innovation:
    - The material recovered and preserved from all processes and technologies will be counted as diversion.
    - Burning waste, without recovering material for reuse, would not be counted as diversion."

Requiring More Diversion: A Long-Term Schedule

Currently, it is within the Minister's power to designate materials, request the implementation of additional diversion programs and to set program development and establish a timeframe for the execution of programs. The Minister has the discretion to request such actions at any time, on an as needed basis. As identified during the stakeholder review, a long-term plan is required for waste diversion in order to provide the certainty necessary for strategic business planning, infrastructure development and investments in new/emerging recycling processes and technologies. The inconsistent flow of diverted materials makes it difficult for businesses to justify investment in diversion infrastructure and technologies. In addition, the materials currently designated under the WDA will not result in the large-scale diversion necessary to make a fundamental change in the waste management framework. Stakeholders would like to see additional diversion of waste from the IC&I sector. They would also like designated materials banned from future disposal in landfills.

To help correct these issues, the Ministry proposes:

- Developing a long-term waste diversion schedule for the province that would:
    - Designate materials for diversion including those discarded in both the residential and IC&I sectors.
    - Set consistent timelines and milestones for each designated material.
    - Set five-year material-specific collection and diversion targets.
    - Ban designated materials from disposal.
    - Provide the authority to carry over plans and targets, and/or to trigger a review of targets five years after coming into force".
- The materials to be included in the five year schedule include:
    - Within the Short term (two years) IC&I generated paper and packaging, additional electronics, construction and demolition materials,
    - Within the Medium term (three/four years) bulky items.
    - Within the Long term (five years) vehicles, branded organics, and small household items.

Effective Oversight

The WDA describes the individual roles for the Minister of the Environment, WDO, and IFO. However, the current structure was found to be ineffective with overlapping roles and responsibilities. A clearly defined structure is required for accountability, to remove duplication, and to ensure the public interest. The WDO and IFOs also lack a secure source of independent funding. These organizations have difficulty in obtaining loans as costs can only be recovered if a program is approved and operational.

The composition of the WDO Board was also questioned regarding its objectivity as some municipal and industry members who sit on the Board are directly affected by diversion programs. Some members of the WDO Board are also members of the IFO. It is suggested WDO Board members be appointed based on skills and competencies.

The Ministry proposes:

- That three main roles be delineated in Ontario's waste diversion framework:
    - Minister of the Environment: Policy Framework and Enforcement
    - Waste Diversion Ontario: Administration, Oversight and Compliance
    - Producers: Meeting Waste Diversion Requirements

Supporting Producer Responsibility and Diversion

Stakeholders feel that EPR alone will not lead to increased waste diversion due to the need to influence significant behavioural changes. EPR coupled with other measures that address the barriers to diversion should be implemented. One of the main financial barriers to increased diversion in Ontario is the low cost of disposal. Waste disposal is significantly cheaper than diversion, thus diversion is not encouraged. One suggestion on how to increase diversion was to establish a disposal levy on each tonne of waste sent for disposal. The gap between costs for disposal and diversion would be lessened thereby providing motivation for increased diversion.

In response to these suggestions, the Ministry proposes:

- Implementing a disposal levy to narrow the gap between the cost of diversion and disposal, and shift behaviour toward greater diversion.
    - Applying the levy to all waste discarded in both the IC&I and residential sectors.
- Using disposal levy revenues to support the waste diversion efforts of businesses, consumers, and municipalities.
- Establishing appropriate oversight and administration mechanisms for the disposal levy revenue.

The Ministry has also suggested a plan for transitioning to a new framework. All stakeholders will be affected if the proposed changes are enacted and there are many intricacies that will need to be considered. To ensure the transition is a smooth one, the Ministry proposes:

- That the government sets regulated phased end dates for each existing program with corresponding milestones and requirements to move existing programs to the proposed new framework with minimal disruption, following consultation with affected parties and the public.
- That transition plans be developed, in consultation with stakeholders, for each program.
- Keeping the current framework in place for existing programs until the transition is complete.

Most critically for Temiskaming Shores, is that it is proposed that a unique transition plan be developed for the Blue Box program – recognizing its long history of shared responsibility – to ensure minimal disruption of services, and so that desired diversion objectives continue to be achieved. The timing and exact nature of any changes in recycling program delivery in Ontario has yet to be determined.

The Ministry is currently accepting comments through the Environmental Registry on the WDA review until January 11, 2010.

3.5 WDA REVIEW: IMPLICATIONS TO THE CITY OF TEMISKAMING SHORES

The major impact the WDA review could have on the City is if producers become fully responsible for waste diversion in the residential and IC&I sectors. However, it is difficult to determine the exact consequences of the potential changes at this time. There are several general implications to the City including:

- Potential loss of control of the recycling program.
    - A transition plan would have to be developed for the Blue Box recycling program. The length of the transition period, nature of the transfer of assets and liabilities etc. have yet to be determined.
    - Eventually, it is anticipated that the City would no longer have control over the level of service offered within the City (i.e., depot, curbside). However, residential and IC&I recyclables would be collected by some method, therefore relieving the City of the responsibility and cost.
- Impact on infrastructure.
    - The CTWMB owns the MRF, so the direct financial effect on the City would be minimal. The largest City-only investment in the current recycling system is the depot bins.
    - It is uncertain as to how capital assets and infrastructure for diversion would be addressed under the proposed changes.
- Staff and Service Levels.
    - There may be an impact on the staffing and service levels associated with the CTWMB recycling program. Changes to recycling and any additional diversion programs that are being planned for by the City under this study may be affected.
- Disposal bans.
    - If a provincial disposal ban were to be put in place, the method of implementation and compliance monitoring would have to be addressed.
    - This may require additional staffing levels at the landfill. The waste collector may also be required to perform cursory inspections of garbage, therefore potentially increasing the cost of collection due to added responsibility and time.
- Disposal levies.

  - In order to provide more incentive for diversion, the review suggested levies be added to all waste disposed of within the residential and IC&I sectors. The method for imposing such a levy on municipalities with municipally-owned landfill sites has yet to be determined.
  - The levies are to be used to support diversion initiatives of businesses, consumers and municipalities. Therefore, it would be anticipated that the City would receive a portion of the levy to support diversion initiatives.

- Program costs.
  - The actual full cost implications of the proposed changes to the WDA are unclear. Full producer responsibility implies that at some point the City would no longer have to fund any portion of the costs for the recycling program or any other diversion programs under the WDA and therefore would realize a cost savings. The potential effect of the changes on waste collection and disposal costs are unclear.

Given the uncertainties as to the effect of the proposed changes to the WDA, and given that the review has flagged the need for a "unique transition plan for the Blue Box program" we recommend the following approach in regards to changes to the recycling program in the City:

- The City may want to wait until the end of the review period on the "*From Waste to Worth"* report before making a final decision on major changes to the City's current recycling program.

- However, at the end of the review period, it is still likely to be unclear as to the exact effect of the proposed changes could be on the recycling system in the Province. An immediate increase in waste diversion is still needed to reduce the City's disposal requirements and prolong the life of existing landfills.

- Given the uncertainties, investing in significant new infrastructure (e.g., a MRF) would not be advisable at this point in time.

Essentially, the City should consider options to enhance the recycling system that limit capital investment, but that will allow for increased diversion within the general framework of the current recycling system in Ontario.

4.0 Recycling Market Conditions

Successful recycling programs are driven by high participation by residents in the program and end markets where the collected recyclable material can be sold for a reasonable price to allow municipalities to recover costs.

The financial crisis that began in the fall of 2008 had a devastating effect on recycling markets. As the manufacturing sector slowed, demand for recycled materials such as steel, paper and plastics declined. This in turn led to a huge decline in the prices being paid for recyclable materials. This forced many municipalities either to sell their recyclable materials at a loss or if they had available space, stockpile materials in the hope that prices would recover relatively soon.

On January 23, 2009, Waste Diversion Ontario, Stewardship Ontario and the Association of Municipalities of Ontario (AMO) released a letter to all Mayors and Members of Council regarding blue box material commodity prices.[15] The letter noted the problems in marketing printed papers and packaging materials due to the decline in global demand for finished products and the subsequent decreased purchase of material and reduced prices. In light of the market conditions locally, nationally and internationally, WDO, Stewardship Ontario, and AMO came to the following conclusions:

- Materials should be marketed, even at reduced revenues.
- Where marketing materials even at reduced revenues is not possible, materials should be marketed to recycling markets that charge a tip fee. Tip fees should be minimized.
- If paper fibres cannot be marketed at reduced revenues or tip fees, materials should be directed to permitted composting facilities. Where the composting facilities are operated by municipalities, the resulting compost should be marketed for revenue.
- For materials other than paper that cannot be marketed at reduced revenues or for tip fees, these materials should be stored until market demand increases.

Recently, as the economy has improved somewhat, the prices being paid for recyclables has increased slightly. That being said, the prices being paid are still quite far from they were prior to the economic turndown. The following table (Table 10) summarizes the prices over the past months. Table 11 provides yearly averages from 1994 to 2009.

[15] Available at: http://www.amo.on.ca/AM/Template.cfm?Section=Waste_Management2&Template=/CM/ContentDisplay.cfm&ContentID=152672

Table 10 Corporations Sharing Responsibility Monthly Averages Price Sheet[16]

MONTHLY AVERAGES (CDN$/Metric Tonne)	Sept 2008	Oct 2008	Nov 2008	Dec 2008	Jan 2009	Feb 2009	Mar 2009	April 2009	May 2009	June 2009	July 2009	Aug 2009
Aluminum Cans	1872	1618	1433	1082	1089	1016	972	1059	1116	1116	1215	1374
Steel Cans	236	110	31	41	44	44	23	27	53	56	74	100
Glass (clear)	27	27	27	27	27	27	27	25	25	25	25	25
Glass (mixed)	(17)	(17)	(17)	(17)	(19)	(19)	(19)	(18)	(18)	(18)	(18)	(18)
PET (mixed)	432	411	53	54	66	109	167	176	200	222	243	191
HDPE (mixed)	798	822	221	181	227	292	341	264	299	313	325	311
Plastic Tubs & Lids	295	286	44	6	6	10	40	35	24	16	23	26
Film Plastic	24	24	9	(5)	(15)	(16)	(10)	0	3	12	10	13
Polystyrene	75	75	75	75	75	75	75	75	75	75	75	75
Newspaper (ONP #8)	167	126	60	39	38	49	58	69	64	69	68	73
Corrugated (OCC)	123	78	51	31	29	40	48	51	55	71	82	78
Hardpack (OBB/OCC)	82	46	na	15	12	18	27	37	35	42	51	45
Boxboard (OBB)	68	36	na	14	3	9	15	19	17	28	30	30
Polycoat Containers	77	74	47	45	28	31	30	30	34	31	31	31
Composite Index	**185**	**143**	**76**	**47**	**48**	**54**	**62**	**70**	**71**	**77**	**81**	**84**

Table 11 Corporations Sharing Responsibility Yearly Averages Price Sheet

YEARLY AVERAGES (CDN$/Metric Tonne)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aluminum Cans	1731	2045	2045	1827	1595	1608	1893	1700	1709	1619	1772	1763	2169	2065	1904	1120
Steel Cans							52	26	47	76	191	116	141	168	245	53
Glass (clear)	47	48	47	47	49	50	50	31	29	34	38	36	36	33	27	26
Glass (mixed)			0	(4)	(25)	(20)	(15)	(15)	(15)	(19)	(12)	(31)	(31)	(31)	(24)	(18)
PET (mixed)	181	650	650	155	300	144	326	324	166	278	432	507	314	368	352	172
HDPE (mixed)	259	345	356	447	226	211	373	257	233	364	428	683	565	524	573	297
Plastic Tubs & Lids		100	100	76	66	3	5	5	0	12	51	104	128	146	204	22
Film Plastic	40	40	40	(4)	(5)	(12)	7	26	0	8	55	148	137	51	35	(0)
Polystyrene	88	110	125	125	125	125	125	125	75	75	75	75	75	75	75	75
Newspaper (ONP #8)	80	214	159	31	48	76	118	76	100	99	114	101	89	118	121	61
Corrugated (OCC)	94	159	214	97	73	99	112	55	106	89	114	95	80	131	111	57
Hardpack (OBB/OCC)	38	159	120	5	17	20	65	38	63	62	75	68	50	89	76	33
Boxboard (OBB)										43	62	53	41	70	62	19
Polycoat Containers		189	198	99	26	24	83	57	58	64	67	66	59	84	75	31
Composite Index							**134**	**95**	**113**	**114**	**131**	**124**	**111**	**145**	**150**	**68**

[16] CRS. The Price Sheet. Available at: http://www.csr.org/pricesheet.html.

The SWMMP reported a financial analysis of the recycling program in 2004 (Table 12). The total quantity of recyclables collected in 2004 was estimated at 499,036 kg.

Table 12 CTWMB 2004 Recyclable Material Sales

Materials Recycled in 2004	Range in Market Price ($)[17]	Revenue to CTWMB ($)[18]
Fibre		
ONP	10 to 140/tonne	2,051
OCC	20 to 280/tonne	8,892
OBB	10 to 140/tonne	0
Mixed Residential Paper	5 to 70/tonne	9,640
Glass	n/a	n/a
No. 1 PET	0.06 to 0.22/lb	3,169
Cans		
Aluminum	0.45 to 0.80/lb	8,429
Ferrous	40 to 90/tonne	970
Total		**33,151**

The CTWMB provided a summary of revenues received from marketing their recyclables in 2008. This information is presented in Table 13. According to the CTWMB 2008 Yearly Operation Report, the CTWMB collected a total of 1,489 tonnes of material in 2008.

Table 13 CTWMB 2008 Recyclable Material Sales[19]

Material	Buyer	Sales 2008 ($)
Mixed Fibres	Ekman Recycling	$ 940.44
	Paper Fibres Inc.	$ 36,059.71
OCC	Paper Fibres Inc.	$ 26,073.50
Aluminum	A-B Recycling Corporation	$ 30,131.00
Ferrous Metals	Ekman Recycling	$ 19,040.15
ONP	None	n/a
PET	Ekman Recycling	$ 1,004.50
	Haycore Canada Inc.	$ 1,010.00
	K-C International	$ 6,296.10
OBB	None	n/a
Total		**$ 120,555.40**

[17] These selling prices were provided by the City of Temiskaming Shores as the actual selling prices for 2005.
[18] The Revenue to CTWMB was calculated using the average of the price range provided by the City.
[19] Treen, David. Email to Janine Ralph. 5 October 2009.

Other amounts were reported for marketed recyclables in 2008 as well.[20] Aluminum was reportedly marketed to Anheuser Busch for $200,000; mixed residential fibre was purchased by Paper Fibres Inc. for $100,000; and REMM purchased OCC for $50,000.

The general revenues per kilogram for all the recyclable materials were calculated for 2004 and 2008. The revenues from marketing recyclables in 2004 is estimated as $0.07/kg and in 2008 it was $0.08/kg. While market variability may currently be impacting the value of certain recyclables; the overall revenue generated for the basket of goods marketed by CTWMB appears to have increased from 2004 to 2008, a time when overall market prices decreased.

5.0 Projected material quantities

A summary of waste projections for the residential and IC&I sectors are provided in this section. A more detailed synopsis of methodologies used and various approaches taken, is included in **Appendix A**.

5.1 RESIDENTIAL POPULATION AND DWELLING UNIT PROJECTIONS

Population growth was determined based on information in the City of Temiskaming Shores 2009 Community Profile and Official Plan. The Community Profile noted the 2006 population as 10,840. The population of the City is predicted to reach 13,760 by 2031, a growth rate of approximately 21%.[21]

The number of current and projected households was also determined. The 2008 CTWMB Annual Report identified the number of households in Temiskaming Shores for 2002 through 2009. Since the population of the City in 2006 is known and projections have already been established, the number of households for 2006 through 2009 was used to calculate the number of individuals per household for each of the years. The average number of people per household (from 2006 to 2009) was then determined and applied to the population projections to determine the increase in the number of households in Temiskaming Shores over the planning period.

The growth in population will also lead to a growth in the number of residential dwelling units. Table 14 identifies the estimated potential change in dwelling units. The population and employment projections in the 2009 Community Profile suggest the City will require an additional 1,540 dwelling units by 2031. Based on the demographic profile of the City, predicted demand will be for single

[20] Wadge, Gary. Email to Marc Dupont. 2 October 2009.
21 Note, the 2009 Community Profile indicated the population would increase 38.7% between 2006 and 2031. However, the percent increase was calculated at approximately 21%.

detached dwellings (1,220 units) followed by semi-detached/row (30 units), and apartments (290 units).

Table 14 Change in Dwelling Units

Dwellings	2006		2031		Change	
	Number of Units	Percent of total Units	Number of Units	Percent of total Units	Number of Units	Percent of total Units
Total Dwelling Units	4,480		6,020		1,540	
Single-detached	3,440	76.8%	4,660	77.4%	1,220	0.6%
Semis, Row, etc.	130	2.9%	160	2.7%	30	-0.2%
Low rise apartments	880	19.6%	1,160	19.3%	280	-0.3%
High rise apartments	30	0.7%	40	0.7%	10	0%
Other[22]	20	0.4%	0	0.0%	-20	-0.4%

Source: City of Temiskaming Shores. *2009 Community Profile*. Prepared by Tunnock Consulting Ltd.

5.2 RESIDENTIAL WASTE PROJECTIONS

Generally, curbside waste audits provide the most accurate dataset on the actual residential waste generation and diversion rates in a community, and can be used to determine the detailed composition of the waste stream. Due to time constraints and other factors, it was not possible to conduct a waste audit as part of this study. In order to generate residential waste projections with an accuracy rate of approximately 10%, audit information from other similar communities (e.g., similar in population, general location, demographics etc.) was investigated. Based on our review of available audit data, it was determined that reasonable projections for Temiskaming could be developed on the basis of recent waste audit results from Renfrew County, Sudbury and West Nipissing. An overview of these results are provided below.

5.2.1 Ottawa Valley (portion of Renfrew County)

The Ottawa Valley Waste Recovery Centre (OVWRC) is located near Pembroke Ontario. While the population served by OVWRC is larger than that of Temiskaming, residents live in a combination of small urban areas with a much larger rural population. OVWRC has many program elements being

[22] Statistics Canada defines Other as *"Other occupied private dwellings' includes other single attached houses and movable dwellings such as mobile homes and other movable dwellings such as houseboats and railroad cars."*

considered by Temiskaming, and therefore presents a picture of what could be achieved in regards to diversion performance.

Waste from the approximately 40,000 residents of Renfrew County that are part of the OVWRC Board is sent for management at the OVWRC facility that consists of : a MRF, composting facilities, a construction and demolition waste recycling area, a Household Hazardous Waste depot, a waste oil transfer station, and a landfill. In 2006, OVWRC conducted two waste audits in the summer and fall within three of its member municipalities (Pembroke, Petawawa, and Laurentian Valley) and also completed winter and spring audits in 2007.[23]

Residents of the OVWRC municipalities have bi-weekly blue box collection, Triple R can (yellow containers), green cart collection and regular waste. Each residential unit is permitted to place up to four garbage bags or cans at the curb for collection (with a maximum weight of 23 kg each). The Triple R can is used for container recycling while the blue box is used for paper recycling.

Key findings for the audits were as follows:

- Audited residents generated approximately 750 kg/hhd/yr of waste (not including yard wastes).
- A total of 56% of the waste stream could be diverted either through recycling (26%) or composting (29%).
- Most recyclables are recovered at a high rate for an overall recovery rate of 74%.
- Those materials achieving a less than 50% capture rate include: paper cups and ice cream containers, laminated paper, composite cans and aseptic containers, PE plastic bags and film (packaging and non-packaging), aluminum foil and trays, steel paint cans, aerosol cans and textiles.
- Approximately 62% of organic material is being diverted through the Green Bin program.

5.2.2 Sudbury and West Nipissing

In 2005, Stewardship Ontario completed an audit in Sudbury and in 2006 an audit was completed in West Nipissing. The data is organized by season (i.e., winter, spring, summer, fall) and detailed material categories are given under the main headings of paper, paper packaging, plastics, metals, glass, household special waste, organics, and other materials.

While both West Nipissing and Sudbury have curbside recycling collection programs, they do have other similarities to Temiskaming Shores. In 2006 the population of West Nipissing was 13,410, such that both municipalities are in the same ‘grouping’ demographically. Both Sudbury and West Nipissing are northern communities with municipally owned MRFs. Therefore, the results of the audits completed in 2005 and 2006 should be directly comparable to results that could be expected

[23] Robins Environmental. 2008. *Four Season Waste Audits for Renfrew County*. Prepared for: Ottawa Valley Waste Recovery Centre.

from Temiskaming Shores, should the blue box recycling program be enhanced to capture more materials and to provide curbside service. Note: the Sudbury audits pre-date the implementation of the curbside organics program and additional improvements to recycling that have increased Sudbury's overall reported diversion rate to 35% in 2007 and higher in 2008.

The following table (Table 15) presents the annual total per household waste generation estimates (combined results of the winter, spring, summer, and fall audits) for both Sudbury and West Nipissing. The total annual residential waste generated in Sudbury was 691.45 kg/hhd while in West Nipissing it was 660.68 kg/hhd. In accordance with the audits, Sudbury's curbside program was diverting 25.1% of the total curbside residential waste stream, while West Nipissing's was diverting 13.1%.

Table 15 Annual Waste Generation Estimates - Four Season Combined Results

	Garbage (kg/hhd/year)	Recyclables (kg/hhd/year)	Total Waste Generated (Curbside) (kg/hhd/year)
Sudbury			
Paper	25.03	74.79	99.82
Paper Packaging	47.27	49.13	96.40
Plastics	54.23	20.77	75.00
Metals	27.29	14.01	41.30
Glass	10.22	27.72	37.94
Household Special Waste	5.58	0.28	5.86
Organics	220.05	13.99	234.03
Other Materials	97.75	3.36	101.10
Total	**487.42**	**204.05**	**691.45**
West Nipissing			
Paper	42.31	29.26	71.58
Paper Packaging	60.06	37.36	97.41
Plastics	61.29	6.06	67.36
Metals	27.15	4.10	31.25
Glass	21.16	7.43	28.58
Household Special Waste	23.03	0.01	23.04
Organics	224.65	0.44	225.09
Other Materials	114.32	2.04	116.37
Total	**573.97**	**86.70**	**660.68**

5.2.3 City of Temiskaming Shores Residential Waste Generation Estimates

To complete the City of Temiskaming Shores' waste projections, the audit results from Renfrew, Sudbury and West Nipissing were used to determine the average household generation rates for each material type and overall per household waste generation. The tonnages reported in the 2008 Temiskaming Shores Recycling Program Summary were then used to estimate the current (2008) capture rate for residential recyclables in Temiskaming Shores.[24] Table 16 provides overall waste generation estimates for the entire planning period.

Table 16 Waste Generation Estimates 2008-2031

Year	Population	# Households	Total Waste Generated (Tonnes)
2008	11,074	4,721	3,509
2009	11,190	4,690	3,486
2010	11,307	4,813	3,577
2011	11,424	4,862	3,614
2012	11,541	4,912	3,651
2013	11,658	4,962	3,687
2014	11,774	5,011	3,724
2015	11,891	5,061	3,761
2016	12,008	5,111	3,798
2017	12,125	5,161	3,835
2018	12,242	5,210	3,872
2019	12,358	5,260	3,909
2020	12,475	5,310	3,946
2021	12,592	5,359	3,983
2022	12,709	5,409	4,020
2023	12,826	5,459	4,057
2024	12,942	5,509	4,094
2025	13,059	5,558	4,131
2026	13,176	5,608	4,168
2027	13,293	5,658	4,205
2028	13,410	5,707	4,242
2029	13,526	5,757	4,279
2030	13,643	5,807	4,316
2031	13,760	5,857	4,353

[24] Note: The 2008 CTWMB Annual Report does not differentiate between IC&I and residential recyclables at the recycling depots. Therefore, the waste diverted listed here may not be all residential.

5.2.4 Estimated Residential Recycling Capture Rates

The current recycling program collects a limited number of materials in comparison with OVWRC, Sudbury and West Nippissing which, in conjunction with other factors (lack of curbside collection), results in lower capture rates.

For example, in terms of paper products (i.e., OCC, ONP, OBB, etc.), the City is estimated as currently achieving a 44.04% capture rate. In comparison, Renfrew County, which has a curbside blue box recycling program, captured 83% of recyclable paper fibres. The current recycling program in Temiskaming Shores is estimated as capturing 5.32% of plastics, 5.06% of metals, and 3.12% of glass in the waste stream, far less than the capture rates for these other programs. See **Appendix A** for more information regarding current capture rates.

While there are differences in waste collection between the municipalities (i.e., curbside pick-up of recyclables), capture rates from the other municipalities are useful for noting areas in which Temiskaming Shores could potentially increase diversion. Table 17 provides an overview of the amount of each type of waste material available in the waste stream and the potential capture rates and diversion performance that could apply if Temiskaming implements an expanded curbside recycling collection program. The capture rates represent reasonable estimates reflecting diversion performance in Sudbury, OVWRC and West Nippissing.

Overall, the total tonnage of residential recyclables that could potentially be diverted each year could increase from 493 tonnes (some of which is not residential) to approximately 800 tonnes per year.

Table 17 Current and Projected Residential Recycling Capture Rates

Material Stream	Estimated Waste Generated	Estimated Total Waste Generated Temiskaming Shores (2008)	Estimated Capture Rate for Recyclables (curbside collection)	Estimated Residential Diversion via recycling (curbside collection)
	(kg/hhd/yr)	(tonnes)		(tonnes)
Paper				
Newspaper – Dailys and Weeklys	21.08	99.51	85%	85
Newspaper - Other	33.47	157.99	80%	127
Telephone Books/Directories	1.34	6.32	85%	5
Magazines & Catalogues	17.87	84.38	70%	59
Mixed Fine Papers	18.39	86.82	40%	34
Books	2.83	13.37	70%	9
Other Paper	2.15	10.16	40%	4
Paper Packaging				

Material Stream	Estimated Waste Generated	Estimated Total Waste Generated Temiskaming Shores (2008)	Estimated Capture Rate for Recyclables (curbside collection)	Estimated Residential Diversion via recycling (curbside collection)
	(kg/hhd/yr)	(tonnes)		(tonnes)
Corrugated Cardboard	34.80	164.28	85%	140
Kraft Paper	3.58	16.92	40%	7
Boxboard/Cores	28.60	135.00	55%	74
Molded Pulp	2.50	11.80	50%	6
Paper Cups and Paper Ice-cream containers	3.32	15.67	0%	0
Laminated Paper Packaging	3.15	14.88	0%	0
Composite Cans	1.32	6.21	0%	0
Gable Top Cartons	3.12	14.72	60%	9
Aseptic Containers	0.75	3.56	25%	1
Tissue and Toweling	18.45	87.11	0%	0
Plastics				
PET Beverage Bottles	8.57	40.45	65%	26
PET Other Bottles & Jars	2.18	10.28	50%	5
PET Other Packaging	1.31	6.21	0%	0
HDPE Beverage Bottles	0.68	3.21	60%	2
HDPE Other Bottles & Jugs	5.01	23.63	60%	14
PVC Bottles & Jars	0.29	1.35	30%	0
Other Bottles, Jars & Jugs	1.29	6.10	30%	2
Polystyrene Packaging	4.91	23.18	30%	7
Wide Mouth Tubs & Lids	2.99	14.10	35%	5
Large HDPE & PP Pails & Lids	1.11	5.23	70%	4
PE Plastic Bags & Film – Pkging	13.46	63.54	15%	10
PE Plastic Bags & Film – Non Pkging	5.10	24.06	0%	0
Laminated/Other Plastic Bags & Film	8.40	39.64	0%	0
Other Rigid Plastic Packaging	5.52	26.06	0%	0
Durable Plastic Products	12.52	59.09	0%	0
Metals				
Aluminum Food & Beverage Cans	5.27	24.86	55%	14
Aluminum Foil & Foil Trays	1.55	7.34	0%	0
Other Aluminum Containers	0.13	0.61	30%	0
Steel Food & Beverage Cans	12.90	60.88	55%	33

Material Stream	Estimated Waste Generated	Estimated Total Waste Generated Temiskaming Shores (2008)	Estimated Capture Rate for Recyclables (curbside collection)	Estimated Residential Diversion via recycling (curbside collection)
	(kg/hhd/yr)	(tonnes)		(tonnes)
Steel Aerosol Cans	0.89	4.20	20%	1
Steel Paint Cans	0.53	2.50	20%	1
Other Metal	11.77	55.59	0%	0
Glass				
Alcoholic Beverage Glass Clear	6.77	31.96	80%	26
Alcoholic Beverage Glass Coloured	7.39	34.90	80%	28
Food and Beverage Glass Clear	15.76	74.41	60%	45
Food and Beverage Glass Coloured	1.22	5.78	85%	5
Other Glass	4.56	21.53	0%	0
			Total	**786**
			% Diversion	**22%**

5.3 IC&I WASTE PROJECTIONS

The IC&I waste stream in Ontario is not well quantified or characterized at a municipal level. Given that Temiskaming Shores does not have scales at either landfill, and that some IC&I material is collected along with residential waste while other IC&I waste may be hauled separately to the landfill, it is not possible to determine a reasonable estimate for commercial waste generation based on Temiskaming's current waste data. This is not unusual, as most municipalities do not have any real idea of the total quantity and types of waste generated by the commercial sector.

The first step in calculating the IC&I waste projections was to determine the number of employees in each industry present in Temiskaming Shores. This information was obtained from the 2006 Statistics Canada Census which classifies the labour force (aged 15 years and over) into nine broad categories (Table 18). 5,400 individuals of the 10,442 population (Statistics Canada, 2006) were in the labour force. The proportion of employees in each industry was assumed to remain stable throughout the planning period. Using the proportion of employees per industry from the 2006 census data, the number of employees for 2008 (the baseline) was calculated.

The Draft Official Plan outlines the City's intention of aggressively pursuing economic development. The employment base is expected to grow from 6,050 to 8,230 by 2031, an increase of 2,180 employees. Based on Statistics Canada 2006 data and the population growth projections for the

City described above, it is estimated that the 2031 employment base would be 7,756 or a growth of 2,356 employees. Both the estimates in the Official Plan, and those determined on the basis of the 2006 census data anticipate similar rates of growth for employment; however since Statistics Canada data is necessary for determining the number of employees in each industry, projections based on their information were used.

Table 18 Number of Employees in each Industry for Temiskaming City (2008, Baseline)

Industry	Number of Employees (2008)	% of Employees in Each Industry (2008)
Agriculture and other resource-based industries	293	5%
Construction	368	6%
Manufacturing	528	9%
Wholesale trade	219	4%
Retail trade	966	17%
Finance and real estate	160	3%
Health care and social services	704	12%
Educational services	459	8%
Business services	1,056	18%
Other services	992	17%
Total Experienced Labour Force 15 Years and Over	5,746	100%

In order to determine the total amount of waste generated by the IC&I sector, data regarding waste generation per employee for the various business sectors was determined based on existing studies of IC&I waste composition. A literature review was conducted to locate studies reporting IC&I waste for other Ontario municipalities. Two such studies were found, one reporting IC&I waste for Owen Sound, the other reporting IC&I waste for Ottawa.

The tonnes of waste produced per employee estimated in the Ottawa and Owen Sound studies were averaged for most industry categories and used to calculate the total amount of waste produced by the IC&I sector in Temiskaming Shores. These estimates are presented in Table 19.

Note: due to the variability in what is considered Construction Industry waste and lack of predictability, this category had to be removed from these projections. There are also no estimated quantities of C&D waste in the SWMMP. The SWMMP does state that construction waste is deposited in a specific area of the landfill, but makes no estimation as to the amount. Further discussion will take place with AMEC, and it is hoped that this discussion and site visits to the landfills could result in determining a reasonable estimate for construction waste.

The “Other services” category can vary significantly between municipalities, due to the many types of services that may be included and the proportion of employees in these services that can be unique to the municipality (Statistics Canada does not provide a further breakdown). The estimated waste generated per employee is quite variable between the Owen Sound and Ottawa studies, providing another reason for concern. While “Other services” will still be calculated in the projections, it is necessary to note that these projections are provided with the caution that they may not be wholly accurate.

Table 19 IC&I Waste Projections in Temiskaming Shores

Industry	Total Number of Employees, Temiskaming Shores Industry Sectors	Waste Generated in Temiskaming Shores based on Average Waste per Employee (tonnes) (2008)
Agriculture and other resource-based industries	293	173
Construction	368	0
Manufacturing	528	523
Wholesale trade	219	301
Retail trade	966	2,313
Finance and real estate	160	72
Health care and social services	704	585
Educational services	459	289
Business services	1,056	586
Other services	992	1,255
Total IC&I Waste Generated		6,097

5.3.1 IC&I Waste Composition and Capture Rates

The City of Temiskaming Shores does not provide recycling services to the IC&I sector. Some private sector collection for IC&I recyclables is available, however the actual quantities and schedule of collection are not currently known. Thus, estimating the waste composition of the IC&I sector is only possible by using information from other studies. Waste composition from the previously mentioned Owen Sound and Ottawa reports, as well as from an additional study which estimated IC&I waste composition for all of Ontario[25], were used to calculate the average amount of each material in the IC&I waste stream.

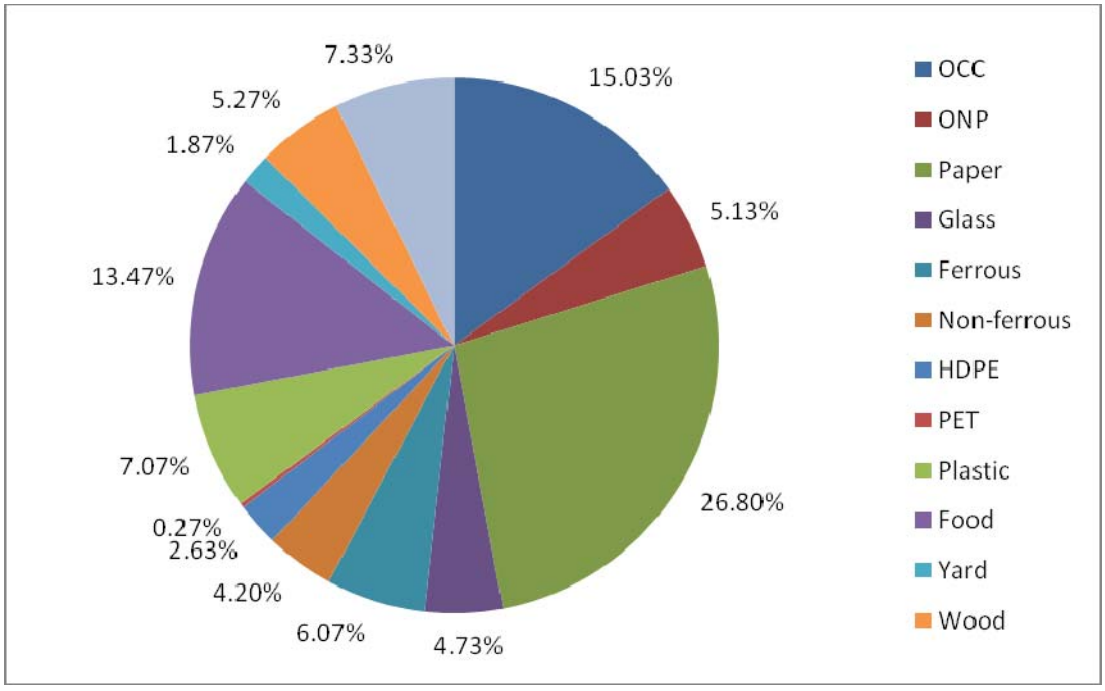
[25] RIS International Ltd. 2005. *The Private Sector IC&I Waste Management System in Ontario*. Prepared for Ontario Waste Management Association.

The waste projections outlined in Table 19, and the waste characteristics for the types of businesses in Temiskaming, were used to calculate the composition of Temiskaming Shore's IC&I waste in 2008 (i.e., the baseline). The results are shown in Table 20 and presented graphically in Figure 4.

Table 20 ICI&I Waste Generated (2008)

Material Type	Tonnes Generated
OCC	917
ONP	313
Paper	1,634
Glass	289
Ferrous Metals	370
Non-ferrous Metals	256
HDPE	161
PET	16
Plastics	431
Food	821
Yard	114
Wood	321
Other	447
Total	6,089

Figure 1 Estimated IC&I Waste Composition



While it is possible to estimate the composition, it is not possible, at this time, to estimate a current capture rate for IC&I recyclables. As noted above, due to the absence of a uniform City-operated recyclable collection system and the lack of information from the private sector recyclable collector, current capture rate estimates would not be given with a very significant confidence level.

In regards to potential future capture rates for recyclables generated by the IC&I sector, reasonable capture rates can be assumed for the various material streams. Generally, for many IC&I generators, higher capture rates and diversion tonnages can be achieved given that many facilities generate larger quantities of single material types (i.e. OCC from retail, mixed paper from offices).

Table 21 presents an overview of the IC&I waste composition, capture rates and potential tonnages of recyclables that could be diverted from the IC&I sector. The capture rates represent reasonable estimates reflecting diversion performance in other jurisdictions.

Table 21 Estimated ICI&I Waste Captured and Diverted, Expanded Recycling Service

Material Type	Estimated IC&I Tonnes Generated (2008)	Potential IC&I Capture Rate, Expanded Recycling Service	Potential IC&I Tonnes Diverted
OCC	917	80%	733
ONP	313	80%	250
Paper	1,634	40%	654
Glass	289	50%	144
Ferrous Metals	370	55%	203
Non-ferrous Metals	256	55%	141
HDPE	161	50%	80
PET	16	50%	8
Other Plastics	431	25%	108
Food	821	0	0
Yard	114	0	0
Wood	321	0	0
Other	447	0	0
Total	6,089	38%	2,322

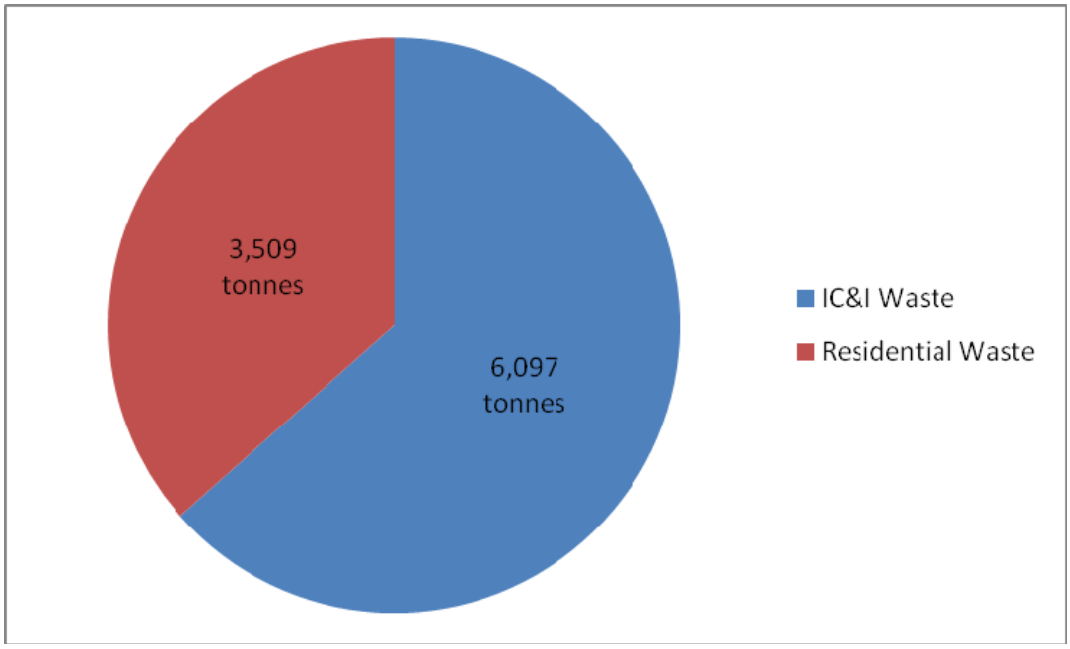
5.4 TOTAL WASTE GENERATION IN TEMISKAMING SHORES

The total waste generated in Temiskaming was estimated by combining the residential and IC&I results in Figure 5. The total estimated amount of waste generated (baseline, 2008) was estimated at 9,605 tonnes. Of this amount, the 2008 CTWMB Annual Report states 493 tonnes of recyclables

were captured and marketed. Therefore, it is estimated the baseline quantity of waste disposed in 2008 was 9,112 tonnes.

The current residential diversion rate is estimated as 14%, if it is assumed that the majority of the recyclables managed by the CTWMB program are generated by the residential sector. The overall diversion rate, based only on the quantity of recyclables managed by the CTWMB for both the residential and IC&I stream is estimated as 5.1%, however, this amount of waste disposed does not include any IC&I recyclables collected and managed separately by the private sector.

Figure 2 Estimated Baseline Temiskaming Shores Waste Generation (2008)



5.5 TARGET MATERIALS FOR RECYCLING PROGRAM EXPANSION

The City of Temiskaming Shores currently accepts mixed paper fibre (old newsprint, old boxboard, and residential mixed paper), old corrugated cardboard, aluminum and steel cans, clear and coloured glass containers, and No.1 (PET) plastic in its recycling program. The 2008 SWMMP recommended the following materials would be suitable for inclusion in an expanded recycling program:

- all paper fibres including soft/hard cover books;
- empty paint/coating cans;
- aluminum foil trays;
- no. 2 HDPE plastics; and,

- coated beverage containers (i.e., polycoat and aseptic containers).

Unfortunately, markets for all of these items are not stable at this time (refer to Section 1.4 for information on market conditions). Therefore, there is some risk that if these materials are collected they may not be able to be marketed or could be marketed at a loss.

Although market barriers may influence the City's decision on the expansion of the recycling program, the major limitation will be who ultimately processes the City's recyclables. For example, if the City were to send their recyclables to Sudbury for processing, it would have a long list of potential items to choose from to include in the program. However, if the City determines the most cost effective and efficient processing option is to manage recyclable materials itself, then it may be most feasible to continue to collect the current streams and not accept any additional materials.

5.5.1 Residential Program

If Temiskaming expands either the depot program or implements curbside recycling and includes additional materials as noted above, the limiting factor will be the processing of a co-mingled recycling stream. As noted in Section 2.7.1, the current MRF lacks capacity and specifically the labour and equipment necessary to process additional materials.

At this point in time, the most viable option for improving Temiskaming Shores' residential recycling program is to send materials to a MRF for processing in an adjacent municipality. The most likely candidate MRFs are located in Sudbury, Ottawa Valley or potentially Quebec, as these MRFs may have additional capacity and are located within a reasonable haul distance. The types of materials that could potentially be collected in Temiskaming would therefore be limited to the materials processed at these MRFs. Table 22 illustrates the materials accepted at the Ottawa Valley Recovery Centre and at the Sudbury MRF.

Both Ottawa Valley and Sudbury provide processing capabilities of all the materials currently collected in Temiskaming Shores as well as additional materials that the City does not collect. If Temiskaming Shores could enter into an agreement with either of these two locations, a public education campaign would be required to inform residents of important changes in the recycling program. Residents will need to be made aware of the acceptance of new types of waste into the recycling program as well as how the recyclables need to be set out for collection. Ottawa Valley currently uses a two stream recyclable system (co-mingled paper fibres, co-mingled containers) while Sudbury collects recyclables in a single stream.

Table 22 Acceptable Recyclable Materials in Ottawa Valley and Sudbury

Material Category	Ottawa Valley	Sudbury
ONP	✓	✓
Telephone Books/Directories	✓	✓
Magazines & Catalogues	✓	✓
Mixed Fine Paper	✓	✓
Books	✓	✓
Other Paper	✓	✓
OCC	✓	✓
Kraft Paper	✓	✓
OBB	✓	✓
Molded Pulp	✓	✓
Gable Top Cartons	✓	✓
Aseptic Containers	✓	✓
PET Beverage Bottles	✓	✓
PET Other Bottles & Jars	✓	✓
PET Other Packaging	✓	✓
HDPE Beverage Bottles	✓	✓
HDPE Other Bottles & Jars	✓	✓
PVC Bottles & Jars	✓	
Other Bottles, Jars & Jugs	✓	
Wide Mouth Tubs & Lids	✓	✓
Large HDPE & PP Pails & Lids	✓	✓
Polyethylene PE Plastic Bags & Film Packaging	✓	
Aluminum Food & Beverage Cans	✓	✓
Aluminum Foil & Foil Trays	✓	✓
Other Aluminum Containers	✓	✓
Steel Food & Beverage Cans	✓	✓
Steel Aerosol Cans	✓	
Steel Paint Cans	✓	✓
Other Metal	✓	
LCBO Clear Glass	✓	✓
LCBO Coloured Glass	✓	✓

Material Category	Ottawa Valley	Sudbury
Non-LCBO Clear and Coloured Glass	✓	✓

5.5.2 IC&I Program

As noted in Table 21, it is estimated that approximately 2,300 tonnes of recyclables could be diverted from the IC&I stream based on reasonable material recovery rates. Some of this material is likely already being diverted, either by individual generators or through use of private collection service or direct haul to the CTWMB MRF. Clean streams of recyclables hauled to the MRF generally require less processing for removal of contaminants on the floor, and can be relatively quickly baled and prepared for shipment to market.

As presented in Table 21, various paper products make up the largest fraction of the IC&I stream and could be handled by the current MRF, if delivered to the facility as a relatively clean stream. Ferrous and non-ferrous metals would make up the next largest portion of the IC&I recyclables stream, followed by various plastics. If delivered to the current MRF as relatively clean streams (requiring minimal effort to remove contaminants) these materials could be managed and marketed (plastics marketed as a mixed plastic stream).

Therefore, it is likely that some or all of the IC&I recyclables would continue to be processed using the CTWMB MRF. However, if the IC&I materials were to continue to be managed at the current MRF, they would have to be limited to OCC, mixed paper fibre, ferrous and non-ferrous metals, PET and HDPE, which are the primary materials generated by the IC&I sector.

6.0 Options for Enhanced Residential Recycling

The City has several options available for collection, transfer, and processing of residential recyclable materials. A reasonable balance between risk, convenience for users, increased diversion rates and program costs needs to be met. The costs relative to the effort associated with increased diversion are usually best rationalized by considering cost avoidance in the future such as the delayed need for landfill closures and decreased future landfill disposal capacity requirements.

The key to the success of any waste diversion program is to ensure that there is an effective and constant level of participation over the long-term. Experience has proven that a diversion system in only effective if the participants understand how to use the system and are willing to use the system. Increased convenience however, usually involves increased program costs, such as that which would be incurred by shifting from depot to curbside recycling collection.

6.1 OPTION 1: STATUS QUO

The City could conclude it is satisfied with its current program and make no changes (status quo). The City generally ranks close to the median value in program performance evaluation (see Table 2) and the depot system provides a common level of service to the residential sector. The cost of the recycling program was $92,119 in 2008 which equates to $19.51/hhd and $186.91/tonne. It is estimated that the recycling program diverted 14.70% of residential waste in 2007, if it is assumed that all recyclables marketed by CTWMB were generated by the residential sector. This is well below the goal of 60% diversion set by the province. Residents must collect their recyclables at home and then travel to one of the eight depot locations to recycle their waste. This may not always be convenient for residents and can pose serious challenges to residents who are elderly or handicapped. Issues have also been noted regarding the limited capacity of the bins at the depots.

The following summarizes the Status Quo Option:

Option 1: Status Quo Summary	
SYSTEM DESCRIPTION	
Processing	Continue to use CTWMB MRF
Transfer/Haul	None
Collection Method	Current Depot Collection
Collection Container	Current Depot Collection, Residents use own container (bag, box etc.) to bring materials to depot
Expanded Recyclables Stream	No
ADVANTAGES / DISADVANTAGES	
Convenience to Residential User	Inconvenient system, Residents must travel to the depots. Perception of depots overflowing at times.
Potential to Increase Diversion	Minimal to None. Residential Diversion remains at between 10 and 15%
Potential to Increase Recycling Program Costs	Minimal to No Increase, Annual program costs approx. $187/tonne
Uniform Level of Service	Yes

Potential to Reduce Landfill Disposal Requirements	Minimal to None

6.2 OPTION 2: EXPANSION OF THE DEPOT SYSTEM

Expansion of the depot system would help with capacity issues and more depot locations could increase the convenience of recycling for residents. The City previously increased the volume of the bins and also purchased two used recycling trucks from the CTWMB to assist in emptying the depots during the peak summer season.

The depot system allows the City to achieve low depot costs per household, but results in a lower recovery and diversion rate. The current locations of the depots may not allow for expansion as most are located in parking lots; proprietors may not agree to having additional parking space consumed by the bins. Expansion of the depot system would not address the convenience issues noted above with the status quo system, nor would it provide an equal level of service for the IC&I sector.

The annual cost to provide the depot system to resident would not change significantly, except for the purchase of new bins. A new 40 y^3 (~30 m^3) bin would cost approximately $10,000 ($6,500 for bin, $3,500 for delivery and installation) based on the most recent costs incurred by the CTWMB for expansion of the depots in Temiskaming.

Option 2: Expansion of the Depot System, Summary	
SYSTEM DESCRIPTION	
Processing	Continue to use CTWMB MRF.
Transfer/Haul	None
Collection Method	Current Depot Collection
Collection Container	Current Depot Collection, Residents use own container (bag, box etc.) to bring materials to depot
Expanded Recyclables Stream	No
ADVANTAGES / DISADVANTAGES	
Convenience to Residential User	Slightly more convenient to users as more depot locations. Residents must still travel to the depots. Perception of

	depots overflowing at times.
Potential to Increase Diversion	Minimal. Residential Diversion remains at between 10 and 15%
Potential to Increase Recycling Program Costs	Minimal Increase. Capital Cost to purchase and install additional bins approximately $10,000 per installation. Annual program costs approx. $187/tonne
Uniform Level of Service	Yes
Potential to Reduce Landfill Disposal Requirements	Minimal

6.3 OPTION 3: RESIDENTIAL CURBSIDE COLLECTION

Temiskaming could choose to implement a curbside collection program for residential recyclables. There are a number of key program elements that have to be considered when designing a new curbside collection system. In the case of Temiskaming, given the limitations on the capacity of the CTWMB MRF to process co-mingled recyclables the decision that would drive the curbside collection system design and costs would be the choice of potential Processing facility. The determination of the processing facility will then drive the other decisions that would have to be made as follows:

- If the recycling facility processes single stream recyclables, then Temiskaming could consider collecting a single stream of fully co-mingled recyclables at the curb. This is generally a more efficient collection method, and allows the use of larger recycling carts which can facilitate bi-weekly (or monthly) collection which is also very cost effective. The design of the transfer facility could be simplified as only a single material type (fully co-mingled recyclables) would have to be managed.

- If the recycling facility processes two-streams of recyclables, then Temiskaming would have to at minimum, collect two-streams, being co-mingled paper fibres and co-mingled containers (glass, plastic, metals). This means each household would need two-containers for collection. This is a somewhat less efficient collection method, and may not necessarily facilitate bi-weekly collection. The design of the transfer facility would have to accommodate two material streams being off-loaded at the same time.

The following sections discuss the advantages, disadvantages and costs associated with each element of the collection system.

6.3.1 Two-Stream or Single-Stream Collection

As a rule, in Ontario recyclables are collected in either of two ways, two-stream (separated into paper fibres and containers) or single stream (mixed) recyclables collection. The advantages and disadvantages of each are summarized in Tables 23 and 24. Because the introduction of single-stream recycling is relatively new in Ontario, very little data exists that quantifies the increase in participation and diversion rates when moving from two-stream to single stream recycling programs. It is, however, reasonable to assume that participation rates will be greater for the single-stream programs which are more convenient to use and understand by residents. It is also reasonable to assume that an equally effective two-stream system could be achieved with the use of appropriately scaled public education, communications and incentives.

The City currently has residents deposit recycling materials in separate bins therefore if the City were to implement two-stream collection, residents would already be generally familiar with the appropriate separation of materials. Whatever method of collection is chosen, the recyclables will have to be sorted at the MRF. As noted previously, Ottawa Valley utilizes a two-stream recycling system whereas Sudbury has a single-stream program.

Table 23 Two Stream Recycling – Generic Advantages and Disadvantages

Advantages	Disadvantages
Potentially higher diversion rate of recyclables due to sorting by residents and resulting cleaner feedstock.	May experience somewhat lower participation rate than single stream dependent on level of promotion and education.
Lower residual rate (5% to 10%) Dependent on level of promotion and education, facility design, and compaction level.	Potentially higher collection costs (dependent on contract structure, collection frequency, and population density) Does not easily allow for co-collection with organics.
Lower MRF costs - less dependent on technology for sorting and processing equipment at MRF.	Requires specialized collection trucks (two-sort systems) – dual compartment.
Higher flexibility - ability to send material to Single Stream MRFs in case of a facility breakdown or process/contract change.	Requires procedure for set-outs that are not sorted properly (e.g., left at the curb with advisory note) which can result in a complaints and reduced participation.

Table 24 Single Stream Recycling – Generic Advantages and Disadvantages

Advantages	Disadvantages
Higher participation levels (especially in a PAYT municipal structure) as limited to no sorting required by residents (actual participation levels will be dependent on level of promotion and education related to recycling).	High residual levels (10-15%). Higher end of range if minimal promotion and education and high multi-residential use (15 %+).

Advantages	Disadvantages
Potentially faster collection (particularly in rural setting).	Slower throughput per hour at MRF requiring larger tipping area and facility capacity (dependent on level of automation and cross contamination of fibres and containers received).
Typically cheaper collection cost per household as commingled material has higher compaction tolerance (dependent on tender structure, type of collection vehicle, collection frequency, and population density).	Higher capital costs and associated maintenance costs (particularly if glass is included in single stream).
Does not require specialized trucks.	Typically higher operational costs (manual labour, residual handling, utility costs). Average costs $80-$90/tonne.
Continued growth due to technology advancements with automated plastic sorting equipment and fibre screens, designed to reduce the operational costs associated with manual labour and increased material throughput and capture rate.	Greater potential to contaminate inbound feedstock and lose captured recyclables in residue stream.
	Limited options in case of facility breakdown or contract change. Limited ability to process single stream recyclables at a two stream MRF.

It should be noted that some of the disadvantages associated with the single stream approach continue to diminish due to technology advancements, particularly with automated plastic sorting equipment and fibre screens. Such advancements are expected to reduce operational costs due to reduced manual labour needs and to increase throughput and material capture rates.

6.3.2 Collection Frequency

According to the WDO Datacall, the median cost to collect recyclables in a rural northern community was $32.68/hhd or $315.00/tonne marketed. The average diversion rate for rural northern communities with curbside collection was 21.4%. Collection costs in rural northern communities is higher than that for southern communities, and those with more dense urban areas due to on-average the greater distance between households.

There are two major limiting factors when determining collection costs, tonnage/volume and number of households. Tonnage/volume is generally the limiting factor in urban areas where a collection truck can reach its maximum capacity before a route can be completed. The number of households is more likely to be a limiting factor in rural areas, where homes are spaced farther apart and the time taken to travel to each home limits the number of collection stops in a normal working shift. In a municipality like Temiskaming Shores, while the majority of residential households are located in ‘urban’ areas, there is a large ‘rural’ population and this can reduce the efficiency of curbside

collection in these areas. One of the methods of reducing collection costs is to collect recyclables every other week (bi-weekly).

A study completed this year (2009) investigated the costs associated with implementing a recycling program in four northern communities, Red Rock, Nipigon, Schreiber and Terrace Bay. Using their existing garbage collection resources, the study estimated the cost to provide curbside recycling collection (Table 25). The cost estimates assumed it would take the same amount of time to collect recyclables as it does garbage. Essentially, the study found that bi-weekly collection could reduce the cost for curbside collection by half.

Table 25 Other Northern Municipalities, Estimated Costs for Curbside Recycling Services

	Red Rock	Nipigon	Schreiber	Terrace Bay
Residential and ICI Garbage Service Assumptions	28 total person hrs (2 crew) $24.66/hr (union) $17.00 (non-union)	28 total person hrs (2 crew) $25/hr (union)	17 total person hrs (2 crew) contract price of $58,000	30 total person hrs (3 crew) $31.00/hr (union – 1) $20.44/hr (non-union – 2)
2008 Dwellings and IC&I Facilities	456 single family households; 30 MFD; 11 IC&I units	656 single family households; 61 IC&I units	550 single family households; 23 MFD; 42 IC&I units	713 single family households; 127 MFD; 63 IC&I units
Weekly Residential and IC&I Recycling				
Estimated Annual Cost	$30,088	$36,400	n/a	$41,221
Cost per household	$60.54	$50.77	n/a	$48.72
Bi-weekly Residential and IC&I Recycling				
Estimated Annual Cost	$15,044	$18,200	n/a	$20,611
Cost per household	$30.27	$25.38	n/a	$24.36

Preliminary cost estimates have been developed for the City of Temiskaming Shores, based on the average potential capital costs and operating costs for recycling vehicles, and assumptions regarding the collection crew that would be needed. Table 26 provides an overview of these preliminary cost estimates and the assumptions used to develop these estimates. These are preliminary estimates only, as additional data is currently being collected regarding the number of households located on each current collection route for curbside waste collection which will be used to refine these costs.

Table 26 Estimated Costs for Curbside Recycling Services, Temiskaming Shores

Collection Assumptions	Low Cost (New Truck)	High Cost (New Truck)	Lowest Cost (Used Truck)
Average Cost, Side Loader (with semi-automated cart tipper)	$220,000	$300,000	$100,000
Annual Capital Cost (6% interest, over 10 years)	$30,000	$41,000	$23,740
Annual Maintenance & Fuel Costs	$6,000	$8,000	$6,000
Annual Labour Cost (1 to 2-man Crew)	$52,000	$104,000	$52,000
Annual Cost Per Recycling Truck	**$88,000**	**$153,000**	**$82,000**
Estimated Avg. HHDs per Collection Route/Day		600	
Potential HHDs with Curbside Collection (detached and semi-detached SFD, low-rise MFD, other)		4,800	
Avg. Number Collection Days Required (i.e. weekly collection would require 2 trucks)		8	

Temiskaming Shores Collection Scenarios	Annual Cost (Low, New Trucks)	Annual Cost (High, New Trucks)	Annual Cost (Lowest, Used Trucks)
Scenario 1, Weekly Collection (2 trucks)	$176,000	$306,000	$164,000
Scenario 2, Bi-weekly Collection (1 truck)	$88,000	$153,000	$82,000
Scenario 3, Monthly Collection (1 truck, run 2 weeks per month)	$59,000	$97,000	$52,740

The potential cost for Temiskaming Shores to separately collect recyclables from residential households could cost between $53,000 and $300,000 depending entirely on the choice of collection approach and on whether the municipality would require new or used collection vehicles to be used under the collection contract. Scenarios 1 and 2, weekly or bi-weekly collection are better suited for two-stream systems, as the storage capacity of the blue boxes used by residents are limited. Scenarios 2 and 3, bi-weekly or monthly collection are better suited for single-stream systems, as the recycling carts that would normally be used for such approaches offer larger storage capacity.

Co-collection of recyclables with other materials would also offer an option to further decrease the cost of collecting recyclables. Co-collection involves the use of split vehicles that can be used to collect more than one material stream. Many municipalities in Ontario have switched to co-collection strategies to improve efficiencies and reduce environmental burden associated with vehicle usage. The City of Hamilton co-collects garbage and organics since they are still operating a two-stream recycling program. The City of Toronto is able to co-collect organics and either garbage or recycling on alternating weeks. Having a single-stream recycling collection program offers the flexibility to co-collect, which will reduce costs and reduce the environmental impact with only one truck pass per

household weekly. Co-collection will be discussed in more detail later in the report, once waste collection has been examined.

6.3.3 Supporting Policies

To encourage recycling participation and increase blue box capture rates, several rural municipalities in Ontario have implemented Mandatory Recycling By-laws that restrict the entrance of blue box material into the municipal landfill sites (e.g., City of Owen Sound, Township of Minden Hills, Township of Madawaska Valley). The Township of Algonquin Highlands, in Haliburton County, implemented mandatory recycling in 2004 and realized an increase from 348 tonnes of recycling collected at the depot in 2003 to 421 tonnes of blue box material in 2004, representing a capture rate of 230 kilograms per household per year.

It is recommended that if the City of Temiskaming Shores implements an enhanced curbside recycling program that the City implement a mandatory recycling by-law. Such a by-law would be more of an incentive to divert rather than a real 'disincentive' as enforcement would have to be undertaken judiciously based on the available resources of the City and its collection contractor. Further discussion on supporting policies for diversion area presented in the Task 4 report.

6.3.4 Set Out Containers

Set out containers are an important aspect to the recycling program. Container capacity must be appropriate for the volume and frequency of collection. If residents do not have adequate capacity in their container, overflow recyclables may be placed in the garbage. There are really only two viable options for set-out containers, based on the availability and type of processing capacity that could be used by Temiskaming Shores:

- Two-Stream Collection:
    - Multiple recycling boxes, residents would require a box for fibres and one for loose containers. No requirement for automated collection vehicle.
- Single Stream Collection:
    - One or more recycling boxes, suitable if the program collects recyclables on a weekly basis. No requirement for automated collection vehicle.
    - Roll-out cart – The roll-out cart ranges in size from 120 to 360 litres. Recycling carts are appropriate for programs with a reduced collection schedule, often bi-weekly or monthly. Semi- and/or fully-automated collection vehicles would be required.

Table 27 provides approximate costs associated with each container option.

Table 27 Recycling Container Cost Considerations

Type of Container	Average Cost/Container	Cost to Roll-out Program (Year 1)	Annual Replacement Cost
Blue Box (Assumes two blue boxes/week set out)	$5.00	$10.00/HHD Total of $48,000	$1.25 /HHD (budget to replace one container for every 4th HHD per annum)
Roll-out Cart (cost dependant on size/design of container) (Assumes one cart/week set out)	$50.00	$50.00/HHD Total of $241,000	NA (usually 10-year guarantee, up to 5% of carts may need to be replaced annually)

6.3.5 Processing & Transfer Costs

6.3.5.1 PROCESSING

As noted previously, the only realistic option for processing curbside collected recyclables for Temiskaming would be to transfer recyclables to another MRF outside the municipality for processing as:

a. The current CTWMB MRF does not have the capacity or equipment to sort up to 800 tonnes per year of curbside collected recyclables;

b. The current CTWMB MRF cannot easily be expanded to process such materials due to constraints related to its location;

c. The potential changes proposed to the WDA and Blue Box (recycling) Program Plan make capital investment in a new MRF risky, as it is not clear if such an investment could be recovered if a different model for diverting recyclables were implemented in Ontario; and,

d. Lastly, it is estimated that approximately 800 tonnes per year of residential recyclables , and 2,300 tonnes of IC&I recyclables could be captured each year for processing, or approximately 12 tonnes per day. Compared to the MRF's noted on Table 8, this is extremely small for a MRF. The cost of equipment and the staff required to process/separate the recyclables would be too expensive. Examined at a cost per household and a cost per tonne perspective, constructing a new MRF would not be viable.

Processing of recyclables is largely carried out by the private sector in northeastern Ontario.[26] In total, 93% of all operations are private, with the remaining 7% of processing facilities operated by the public sector.

[26] TSH. 2006. Northern Ontario Waste Diversion Study. Available at:

As part of the WDO's Datacall, municipalities report the costs of processing recyclables. There is a wide range of processing costs in Ontario. The median cost for processing in 2008 was $0/tonne and the average cost of processing recyclables was reported as$40.61/tonne.

Table 28 below provides the processing costs reported by those municipalities who send waste to the MRFs identified in Table 8. These costs are provided as an estimate and may not be entirely representative of prices Temiskaming Shores would be able to negotiate with each MRF operator (i.e., a MRF owned by a municipality will likely have increased costs to process recyclables generated outside of the municipality).

Note, the reported processing costs in some cases are gross costs (pre-revenues), and in some cases they are net of revenues, as the municipality may pay only the net cost to the processor. In other cases, processing costs and collection costs are included under a single private sector contract, and therefore the processing costs are reported as $0 with all contract costs reported under collection.

Table 28 Processing Costs at Selected MRFs

Location	Municipally or Privately Owned	Address	Reported Processing Cost/Tonne	Distance from New Liskeard
Sudbury	Municipal	1825 Frobisher Street	$106.78 (gross) $25 (net)	219 km
Sturgeon Falls	Municipal	219 O'Hara Street	$0 - $29.71	156 km
Blind River	Private – Municipal Waste Recycling Consultants	9 Industrial Road	$0	390 km
North Bay	Private – Miller Waste Systems	112 Patton Street	$24.05	159 km
Sault Ste. Marie	Private – Green Circle Environmental	11 White Oak Drive East	$70.39	533 km
Timmins	Private – Waste Mgt. Corp. of Canada	278 Feldman Road	$0	210 km
Timmins	Private – Miller Waste Systems	n/a	$0	~200 km
Ottawa Valley Waste Recovery Centre	Municipal	900 Woito Station Road	$311(gross) (note tipping fees for recyclables hauled to the site by non-OVWRC generators on website listed as	394 km

http://www.stewardshipontario.ca/bluebox/pdf/eefund/reports/130/130_final_report.pdf

Location	Municipally or Privately Owned	Address	Reported Processing Cost/Tonne	Distance from New Liskeard
			$40/tonne)	
Ottawa	Private – Metro Waste Recycling	2811 Sheffield Road	$94.24	522 km
Armour	Municipal	n/a	$476.89	247 km
Rouyn-Noranda, Quebec	Private	220 Marcel Baril Avenue	$0	138 km

To-date, Stantec has discussed the option of hauling Temiskaming recyclables to the following MRF's and have identified the following potential tipping fees on a preliminary basis:

a. OVWRC: Has available capacity. Potential charge for processing, $40/tonne. Could charge less for clean large loads of recyclables (e.g. OCC).

b. Sudbury: Has available capacity. Currently waiting on pricing information. Preliminary estimates indicate that the potential charge for processing could be in the order of $30 to $40/tonne. Need to confirm if a special rate would be available for clean loads of recyclables (e.g. OCC).

6.3.5.2 TRANSFER

A transfer station is designed to serve as a link between a collection program and the final destination of the material. In the case of residential blue box material, a transfer station has the ability to receive residential recyclable material directly from the curbside collection trucks or rural depot bins and be consolidated onto larger transfer trailers to be transported to Material Recovery Facility (MRF) for sorting, processing and marketing of the blue box material. Transfer stations dedicated to blue box material also offer the following opportunities:

- Reduces internal short-haul costs within a municipality; reduces external long-haul to costs to MRFs by consolidating material at a central location (site);
- Flexibility for temporary on-site storage of blue box material during peak seasonal generation periods (May to October) to prevent unsightly overflow issues and material contamination at rural depot sites;
- Flexibility to manage unexpected receiving delays from MRFs; and,
- Greater flexibility for future growth with ability to select larger scale MRFs with increased processing capabilities (single stream) and/or lower processing costs.

Transfer Station Siting

Finding a suitable recycling transfer site impacts the level of public acceptance, the ease in obtaining Provincial approvals and the overall cost efficiency for operation. Factors to be considered include:

- Economic

  Economic factors included the estimated costs for the development and eventual operation of a transfer station based on the location of the site. For example, it can be anticipated that a blue box transfer station site selected in a remote location, on tertiary roadways with seasonal load limits will not have easy access to services (hydro, snow removal, fire).

  The size of the transfer station directly affects the development costs. The volume of earth movement to prepare the site, the level of engineering and associated structures for the facility all are factors affecting the overall cost of the transfer station.

- Environmental

  From an environmental perspective, the preferred location for a transfer facility would be within an approved industrial zoned property or on property already identified for the purpose of managing waste such as one of the existing municipal landfill sites. If such locations are not available additional environmental factors beyond the Section 27 of the Environmental Protection Act must be considered. When siting a facility in a rural or remote area, the siting must consider any identified habitat of threatened or endangered species and other protected environmental zones such as prime farmland, aquifer recharge zones, ecological resources, wet lands, surface water bodies and flood plain areas.

- Social

  Social factors impacting the siting of a recycling transfer station have the potential of becoming extensive depending on the location of the site. Again, the preferred location would be on land already designated for industrial or waste management purposes. A site established in an area close to sensitive areas such as hospitals, schools, and residential development must consider additional setback and screening (landscaped berms, fencing, etc). Although blue box material is not considered a waste, public acceptance is vital. A critical issue is traffic. If traffic is not compatible with surrounding land uses (local roads and side streets) public opposition can develop. The establishment of a centralized transfer site at an existing waste disposal site that already has high vehicle traffic typically has the transportation infrastructure to support additional truck traffic generated by a centralized transfer site. In addition to sensitive areas, the local municipality may have historical or cultural sites protecting specific forms of development.

- Physical Limitations

  The physical limitations of a potential recycling transfer site may not be as obvious as what can be witnessed from visual inspection. Easements and rights of ways of properties have potentials to split a parcel of land into smaller pieces. Gas pipelines, overhead power lines, underground tanks, sewer, or water systems must all be considered.

  Again, the preferred option for transfer facility siting would be on land already owned and controlled by the City, for which any physical limitations are already clearly understood.

- Access

  When considering the establishment of a blue box transfer site, one of the key objectives to determining a locator position near the source of material generation. Simply stated, to locate a transfer station in a remote location adds to the overall operational costs of the system. Although opportunities exist to reduce costs by moving the same payload in a compacting transfer trailer system, there is an added cost to longer hauls based on the increase in the cycle time of the vehicles on the roadways. The more a truck is on the road returning to the

site (empty), the higher the costs associated with the transfer of material. Truck travel on the roads impacts efficiency as well as wear and tear on the roads and vehicles. Additionally, seasonal restrictions on some roads limit the weight a vehicle is permitted to carry.

Based on the site visit undertaken on November 4th, 2009, it appears that the New Liskgeard landfill offers advantages in regards to all of the above considerations as:

- The site offers access to site services such as hydro etc. and there are cleared areas within the landfill boundaries that could be used for transfer facility development.
- The site is already used as a disposal facility and cleared areas may be available of a suitable size on the site. This would minimize the potential environmental disturbance associated with developing a transfer station.
- Locating a transfer station at this site, would be compatible with existing land uses in the area.
- Physical limitations associated with the use of this property are minimal, and the land is already controlled by the City.
- The site is easily accessible from across the municipality.

Transfer Station Costs

The complexity of the transfer station affects capital and operational costs. A blue box transfer station that is not designed to accommodate access to public drop off, or does not provide internal compaction mechanisms (on-site stationary compactor) and does not require a building to contain the operation will have less associated capital infrastructure costs and on-site costs than a site incorporating on-site compaction and sorting of additional divertible material.

If land purchase is a necessary part of the transfer station siting, the costs associated with the purchase of the land, including possible severances, realtor fees, and taxes will be applicable. Therefore, to site a blue box transfer facility at an existing waste disposal site owned by a municipality with the Certificate of Approval to permit the receipt of waste will require less capital and permitting costs to develop than a “Greenfield” site.

When considering available transfer systems for recycling, it is possible to adopt components from municipal solid waste transfer systems (i.e. bagged residential garbage). Unlike solid waste compaction using 4:1 ratios with the intent to achieve maximum payload per trip, blue box material compaction is dependent on the processing capability of a MRF. It is also important to note that cost savings realized from automated compacting transfer systems may be offset by the increase in costs associated with the ability of a Material Recycling Facility (MRF) to process the material. A

MRF receiving material where the level of compaction results in poor performance from the sorting equipment will impact the overall processing cost of the material. In addition to compaction, blue box material is considerably lighter in weight than residential waste therefore it is not as critical to incorporate thick concrete walls or reinforce walls with steel plating nor is it vital to use high horsepower front-end loaders to move material within the facility. However, in transfer station applications where material is tipped onto a facility tipping floor, the larger the loader bucket, and the higher the reach on the loader boom impacts the overall loading time attributed to transferring material from the tipping floor to a transfer trailer.

It is important to note that transfer facilities do not necessarily need to be established in an enclosed building structure. In many rural locations, transfer facilities are located in open air environments designed to be accessible for general public drop off of blue box material. Typically, where tonnage generation is less than 5,000 tonnes per year, a transfer facility without enclosed building structure is suitable.

For transfer facilities intended to receive higher tonnage of blue box material (<10,000 tpy), the method of receiving inbound material at the transfer station impacts the total floor space of the facility and the overall method of transfer. For example, a transfer station with an on-site public drop off component will require additional storage and receiving area for material received by residential vehicles.

The following tables (Table 29 and Table 30) outline some common blue box transfer systems and the advantages and disadvantages of the varying technologies.

Table 29 Blue Box Transfer Systems – Advantages and Disadvantages

System	Advantages	Disadvantages	Cost	Applications & Examples
Direct deposit into open roll-off containers using outside operations or within an enclosure	• Low capital costs • Do not require outer building structure • Convenient for small spaces • Roll-off truck transferable for municipal public works applications	• Low payloads in roll-off containers • Potential for overflow in peak usage periods • Not accessible to curbside vehicles	• ~$8,000/roll-off bin • ~$80,000/roll-off vehicle • plus site construction (concrete retaining walls)	• Primarily rural systems with hauling distances less than 200km • Example: County of Haliburton, County of Peterborough, North Frontenac
Direct Deposit onto tipping floor within an	• Do not require on-site trailers(Ability to use brokerage	• Potential for higher operational costs with	• Loader ~$65,000 • Building structure • Concrete flooring	• Small to Medium size transfer sites in areas servicing

System	Advantages	Disadvantages	Cost	Applications & Examples
enclosure	service for trailers • Can screen material on tipping floor • Low capital costs	double handling of material • Required larger tipping floor area for loader and trucks	to support structure	combined rural/urban centres • Examples: WMI transfer station, Courtice, On.
Direct load into top load compacting containers for outside operations	• Low capital costs • Do not require outer building structure • Ability to accommodate curbside vehicles & public drop off with infeed hopper retrofits.	• Require hydro or generator to operate compactor • Need hopper infrastructure and ramp (metal or earth ramp with concrete retaining walls)to access system for users	• ~$40,000 for compactor and hopper • ~$5000 to $10,000 for generator (dependent on size) • Site construction for public access hopper to compactor	• Small transfer sties in primarily rural areas • Example: Perry Township, & Bonnechere Valley
Top load trailer in an enclosed structure	• Ability to compact in trailer with loader bucket or load loose material • Require less tipping floor space Does not require hydro	• Medium capital costs unless use a broker for trailer • Require enclosure to prevent windblown litter • Require larger loader to load inside trailer unless incorporate a surge pit to trailers	• ~$80,000 for non-compacting trailer • ~$125,000 for loader • building structure and concrete flooring	• Medium size transfer systems (50 to 100 tpd) • Example: WSI waste transfer site in Bracebridge, On,
Top load compacting trailer in an enclosed structure	• Ability to have on-site compaction • Requires less tipping floor space • Does not require hydro	• High capital cost • Require just-in-time service for trailers • Limited to level of compaction	• ~$130,000 for compacting trailer • ~$125,000 loader • building structure and concrete flooring	• Medium size transfer systems • Example: WMI waste transfer site in Scarborough, On

System	Advantages	Disadvantages	Cost	Applications & Examples
		allowable for container material based on MRF standards		
Modular Compacting Transfer System (i.e.: Transtor Unit) without enclosure	• Flexibility to handle varying volumes of material • Ability to compact material therefore require less tipping floor space • Suitable for public drop off and accessible by curbside trucks or drop off vehicles • Loader operator not required at the site • Reduces windblown litter and vermin vector issues Does not require enclosure	• Higher capital costs • Requires service by compacting trailers to maintain compaction level of material • Limited to level of compaction achievable for container material based on MRF standards • Requires concrete and electrical infrastructure • Suitable for higher volumes of material. System suitable for minimum. 1000 blue box tonnes per year to justify capital investment	• ~$110,000 for compacting Transtor unit • 3 phase power • Heavy concrete infrastructure to support unit • ~$130,000 for compacting trailer	• Often used as larger scale transfer systems or community recycling centres Example: Region of Peel Community Recycling Centre • Used in smaller communities where recyclables may need to hauled a longer distance. Example: Dryden

Table 30 Building Structures – Advantages and Disadvantages

Building Structures	Advantages	Disadvantages	Cost	Applications & Examples
Cover All Structures	• Lower capital costs ($13 per square foot for	• Sound is not buffered within structure	• Coverall Enclosure Systems	• Small, Medium and Large Scale applications

Building Structures	Advantages	Disadvantages	Cost	Applications & Examples
	structure) • Structure can be built within 7 days • Structure does not require a lot of concrete for support walls • Ability to use natural lighting during day • No support beams to obstruct floor space	• Not as air tight as metal structure for negative pressure applications • Fabric cover requires replacement in 15 to 20 years	~$13/ft^2 • Concrete flooring and walls~$10/ft^2 (does not require as thick a foundation as a metal structure)	• Examples: City of Toronto (Scarborough Site) • Rancor Wood Recycling, Belleville
Metal Clad Buildings (Butler Buildings)	• Structure can be insulated for noise reduction and heat retention • Ability to use negative pressure within structure	• Higher capital cost Building has maintenance costs • Flat roofing in winter climates require maintenance • Require additional concrete sub flooring to support structure weight	• ~$20/ft^2 for structure • ~$15/ft^2 concrete support foundation and flooring	• Medium and Larger scale operations • Example: WMI transfer station, Scarborough, On
Sand Dome	• Low capital costs • Ability to incorporate negative pressure within the structure • High ceiling heights for unloading and loading • No support beams	• Requires shingle replacement (10-15 years) • Limited in size of structure • Requires extra interior lighting	• ~$10/ft^2 for structure • ~$10/ft^2 for concrete and push walls • hydro required for lighting or purchase of generator	• Small or Medium size operations • Example: Miller Waste Systems, Markham

When considering the basic operational costs associated with a recycling transfer station, there are two primary cost categories:

- The cost to store and handle material; and,
- The cost to haul material.

The cost associated with haulage includes the fuel, and operational costs to travel (labour) the distance to the processor and the amortized cost of the vehicle to haul the material.

The costs associated with storage and handling of materials, include the amortized costs of any buildings/installations, facility staffing, the loader to load material and the utility costs to service the transfer station.

Preliminary estimates (based on 2007 $) for a simple outdoor transfer facility are provided in Table 31. The total cost for equipment and site development is estimated at $620,000. A small building would be required for the scale house/site attendant. A weigh scale would be included at the entrance to the transfer station to offer tracking capability of all inbound and outbound material. Roll-off boxes and stationary compactor units would be sited in an area where larger truck traffic can access the bins. Over a ten year period and at a 6% interest rate, the amortized cost for such a transfer station would be $65,720/year.

Table 31 Example 1: Recycling Transfer Station Preliminary Capital Costs

Blue Box	Cost	Units	Sub-Total	Interest	Amortized over 10yrs
Equipment					
Stationary Compactor & Hopper	$40,000	2	$80,000	$4,800	$8,480
Cardboard Compactor	$40,000	2	$80,000	$4,800	$8,480
Site Capital					
Weigh Scale & Tracking System	$80,000	1	$80,000	$4,800	$8,480
Scale House	$20,000	1	$20,000	$1,200	$2,120
Fencing	$40,000	1	$40,000	$2,400	$4,240
Signage	$5,000	1	$5,000	$300	$530
Hydro Installation	$100,000	1	$100,000	$6,000	$10,600
Front-End Loader	$140,000	1	$140,000	$8,400	$14,840
Poured & Block Concrete Retaining Walls	$75,000	1	$75,000	$4,500	$7,950
Total Estimated Capital Costs			$620,000	$37,200	$65,720
Total Cost Per Tonne (877 tonnes)					$74.94

Alternatively, the City could consider installation of a transtor unit. A recent case study from the City of Dryden illustrates the potential cost savings from retrofitting an area located near their old MRF to be used as a transfer station. Dryden determined that it was no longer economically feasible to operating and process blue box tonnage at their municipally owned MRF.[27] The processing cost was estimated at $600/tonne. Dryden established a temporary transfer station at the MRF and transferred recyclable materials to Winnipeg for processing. While costs were lower than operating the MRF, hauling costs continued to increase due to rising fuel surcharges and low to moderate weights on the walking floor trailers. In 2004, Dryden received $250,000 from Stewardship Ontario's Effectiveness and Efficiency Fund to install two Transtor (compactor units) at the MRF site and purchase one compaction trailer. The total project cost (including capital and operational costs) was $560,000. Capital costs are presented in Table 32. Since the Transtor units are not located within a building, capital costs were limited to the units themselves, electrical supply and installation, brush clearing, bin walls, upper deck and approach ramps, retaining walls, road upgrades, and access stairs.

Table 32 Example 2: Transfer Station Capital Cost Summary

Item	Unit	Unit Cost	Total Cost
53 Cubic Yard Transtor unit	2	~$100,000	$200,000
1000 Cubic yard compaction trailer	1	~$40,000	$40,000
Bin walls, concrete, ramps, hydro, signs, fencing, etc	n/a		$200,000
Total			~$440,000

Staff reportedly spent less operational hours on-site with the use of the Transtor units. These units can load materials directly in the compaction trailer, thereby eliminating the need for a loader and operator. The Transtor units are also virtually bear proof. Dryden was able to load between 18 to 20 tonnes per trailer in approximately 2 hours time. A truck was not purchased by Dryden, rather haul costs were contracted out in order to save costs (approximately $135,000 for a truck). Dryden provided a summary of annualized transfer costs for the recycling program including all operational costs associated with the management of the transfer station (i.e., utilities, labour, snow removal, etc.) (Table 33).

[27] 2cg. 2008. City of Dryden Transfer Station. Prepared for Stewardship Ontario and the City of Dryden. Available at: http://www.stewardshipontario.ca/bluebox/eefund/projects.htm#12

Table 33 Annualized Dryden Transfer Cost Summary

Year	Tonnes	Transfer Costs	Transfer Operating Cost/Tonne	Notes
2005	444	$80,800	$182/tonne	• full year of transfer station operations, using walking floor trailer
2006	496	$92,250	$186/tonne	• second year of transfer station operations, using walking floor trailer
2007	573	$79,700	$139/tonne	• third year of transfer station, using Transtor units

Hauling costs from Dryden to the MRF in Winnipeg located approximately 350 km away, were approximately $52/tonne ($0.09 per tonne/minute) with average load sizes of 17 tonnes per transfer trailer.

For the City of Temiskaming Shores, the potential cost to haul curbside collected recyclables for processing at a MRF located outside the municipality will be contingent upon:

- The source and destination of the waste;
- The type of truck employed; and
- The annual quantity of waste hauled.

From the information presented previously regarding MRFs with potential capacity for processing, two publicly operated MRFs with available capacity will be analyzed for approximate haul costs. The MRF in Sudbury is located 219 km from New Liskeard and the MRF operated at the OVWRC is 394 km from New Liskeard. Preliminary haul costs for Temiskaming shores are calculated in Table 34, assuming that the City would contract haulage to the private sector, based on the cost per tonne/minute calculated for Dryden.

Table 34 Preliminary Haul Cost for Transporting Recycling to Another MRF

Source	Destination	Truck Type	One Way Distance Travelled (km)	Average Speed On route (km/hr)	One Way Travel Time (min)	Load/ Unload Time (min)	Round Trip Cycle Time (min)	Haul Cost ($/tonne)
New Liskeard	Sudbury	Transfer Trailer	219	80	164	20	369	**$33.76**
New Liskeard	OVWRC	Transfer Trailer	394	80	296	20	631	**$57.81**

**Round trip cycle times multiplied by $0.0916 based on Reported Dryden transfer costs.

6.3.6 Residential Sectors to be Serviced within Enhanced Recycling System

There are several options that can be evaluated regarding residential collection of recyclables.

One option is to offer curbside collection for all residential locations, including both single family (SFD) and multi-family dwellings (MFD). A uniform level of service would be offered throughout the City with this option.

Curbside collection could be offered to only single-family dwellings (i.e., those dwellings with less than 5 units). Larger multi-family dwellings would be required to use larger carts or bins. This option was implemented in Elliot Lake. The City of Elliot Lake has a population of 11,500 which is composed of approximately 6,000 households. Elliot Lake offered a curbside collection program to single family residences, but required individuals living in MFDs to take their recyclables to a central depot. In 2007, Elliot Lake implemented a MFD recycling program at three of its largest complexes, with a fourth complex added later the same year. Each complex was provided with four bins, one for corrugated cardboard and boxboard, one for aluminum and steel food and beverage containers and for #1 and #2 plastic, one for paper, and one for glass. Over a one year period, a total of 67 tonnes was diverted through the MFD program.[28] The cost for collection of the MFD bins increased Elliot Lake's collection contract by $5,760/year. Including promotion and education, the total annual cost for the MFD program was $8,229, which amounts to $122.81/tonne/year or $10.49/unit/year. However, the cost per tonne of recyclables has steadily decreased from $138.93 in 2006 to $110.43 in 2007 and $88.85 (January to July) in 2008.

A third option would provide SFDs located in urban areas with curbside collection. Rural SFDs would continue to use the current depot system and MFDs would divert materials in carts or bins. This option would create a non-uniform level of service and the City would still be required to maintain the existing depot system.

Table 35 summarizes the advantages and disadvantages between these options. In order to provide a reasonable level of service to the residential sector and to achieve reasonable collection efficiencies and participation, it is recommended that Temiskaming consider providing curbside service to all SFD units and MFD buildings up to and including 5 units, and a cart or bin based service for larger MFD buildings of which there are very few within the City.

Table 35 Advantages and Disadvantages of Residential Recycling Options

Sector Serviced	Advantages	Disadvantages
Curbside collection for all residential locations.	• Provides a uniform level of service across the entire residential sector. • Should achieve good participation rates and diversion rates for	• Lack of efficiency as rural dwellings are often spaced some distance apart. • Collecting multiple blue boxes from MFDs would require additional time for each MFD collection stop. • MFD units may not have space for

[28] Elliot Lake Multi-Residential Service, E&E Number 241, 2008. Available at: http://www.stewardshipontario.ca/bluebox/pdf/eefund/reports/241/241_report.pdf

Sector Serviced	Advantages	Disadvantages
	recyclables	recycling containers, decreasing participation.
Curbside collection for SFDs and cart/bin service for MFDs.	• Increased efficiency as collection crew does not have to collect multiple blue boxes at the curb for larger MFDs. • Provides more storage capacity for recyclables from MFD units. • Should achieve good participation rate and diversion rates	• Non-uniform level of service. • MFD residents will have to take recyclables to a central point for collection.
SFDs in urban areas receive curbside collection, SFDs in rural areas use the depot system, and MFDs receive cart/bin service.	• Collection would be more efficient as the amount of time spent driving between stops would be minimized.	• Non-uniform level of service. • Potentially less diversion of recyclables • While there may be cost savings related to curbside collection, the City would have to pay to maintain and operate the majority of the existing depots.

6.3.7 Option 3 Summary

Option 3: Implementation of Residential Curbside Recycling Collection, Summary	
SYSTEM DESCRIPTION	
Processing	Haul recyclables to MRF outside of Temiskaming Shores (Sudbury, OVWRC, others…)
Transfer/Haul	Transfer Station, Most likely located at New Liskeard Landfill. Haul via top-loading walking floor or compaction trailer.
Collection Method	Depending on secured processing capacity, likely bi-weekly collection of two-stream recyclables, or bi-weekly or monthly collection of single-stream recyclables.
Collection Container	Depending on secured processing capacity, either blue-boxes for two-stream recyclables or recycling carts for single stream.

Option 3: Implementation of Residential Curbside Recycling Collection, Summary	
Expanded Recyclables Stream	Yes, expand to match material streams currently handled by processor.
ADVANTAGES / DISADVANTAGES	
Convenience to Residential User	Much more convenient for residents.
Potential to Increase Diversion	Significant, could increase overall residential diversion to 22% or more depending on participation and capture rates.
Potential to Increase Recycling Program Costs	Capital investment in transfer station required ($450,000). Partial funding should be available from CIF or other funding sources. Operating costs would include cost to collect, handle/transfer, haul and processing tip fee. One time only roll-out costs for purchase of recycling containers and promotional materials would be incurred. Partial funding should also be available from CIF for these costs that would range from $58,000 to $250,000. Detailed cost summaries are provided below. Potential costs could range between $172,000 and $232,000 annually depending on the system, or between $112,000 and $151,000 net of WDO funding. The cost per tonne would range from $142 to $192 net of WDO funding. The potential increase in municipal taxes would range from 1.3 to 1.7%.
Uniform Level of Service	Yes, uniform level of service offered to all SFD and smaller MFD (up to and including 5 units). Recommend for larger MFD buildings that service include cart or bin pick-up depending on size of the building.
Potential to Reduce Landfill Disposal Requirements	Significant. Doubling of diversion by residential sector would decrease annual tonnages sent to landfill by approximately 400 tonnes per year or more.

Table 36 provides a summary of the potential range in recycling program costs. The lowest end of the cost range assumes that the City secures an agreement with a closer MRF (Sudbury), thus reducing haul costs and that single-stream recycling service is provided on a bi-weekly or monthly basis using used recycling trucks. The higher end of the cost range assumes that the City secures and agreement with a MRF farther away (OVWRC), and that bi-weekly two-stream recycling service is provided using new recycling trucks. In both scenarios, it is assumed that a transfer station is developed at the New Liskeard landfill site, using transtor equipment for a total capital cost of approximately $450,000. In addition, in order to implement the new program, there would be a roll-out cost of approximately $48,000 (blue boxes) to $240,000 for purchasing and providing each household with recycling containers and promotional costs of approximately $10,000.

Funding provided through the WDO (Provincial Blue Box Program Plan) is assumed at a level of 35% of gross operating costs for the system, although actual funding levels would depend on the formula applied and the overall program costs and program performance of the system. The potential impact to the municipal tax base assumes that for every $88,000 increase in municipal spending, there would be a concomitant 1% increase in property taxes.

Table 36 Summary of Potential Residential Option 3 Annual Program Costs

Cost Component	Range in Potential Annual Operating Costs*
Collection	**$53,000 and $88,000**
Processing	**$25,000 and $32,000**
Transfer Station	**$67,500**
Haul	**$26,500 and $45,500**
Total Annual Cost (pre-WDO Funding)	**$172,000 and $232,000**
Estimated Potential Funding	**$60,000 and $81,000**
Net Annual Cost	**$112,000 and $151,000**

* Numbers may not add correctly due to rounding.

7.0 Enhanced Recycling for the IC&I Sector

There is no current recycling collection program in place for the IC&I sector. Continuation of the status quo system would require the IC&I sector to transport their recyclables to the MRF or to use the private collection services offered within the City. The diversion rate for the IC&I sector would

remain stable. No additional costs would be incurred by the City. There are no accurate estimates of the total quantity of IC&I materials currently managed by the MRF nor any allocation of costs between these materials and those that are managed through the depots. It is reasonable to assume that in the order of 100 tonnes per year (at least) of recyclables including clean loads of OCC, paper fibre and other materials are received at the MRF from the IC&I sector. The actual cost to the City for the management of these materials would be for processing (minimal) and baling these materials for shipment.

Option 2, would be to provide municipal collection services for recyclables from all IC&I facilities, up to a defined limit. Servicing the entire IC&I sector has the potential to divert approximately 40% of the IC&I waste stream, but would cost approximately $300,000 to $400,000 per year (up to $170/tonne) or more to collect, transfer, haul and process these materials in a fashion similar to that proposed for the residential sector. To support this system, the City could enact a by-law requiring recycling of materials by all IC&I generators and/or banning loads including 5% or more of recyclable materials from the landfill. It is estimated that in the order of 2,300 tonnes per year of recyclables could be diverted by the IC&I sector under such a system.

A third option would offer curbside collection to IC&I facilities that generate approximately the same amount of recyclables as a resident. Recyclables would be collected as part of the residential collection routes and would be funded by the City. In the order of 90 to 100 IC&I locations (around ¼ of the total IC&I properties) could be expected to participate in curbside collection based on previous estimates of those eligible for curbside services. This number needs to be refined as better collection route information is obtained from the City. The incremental cost of including these locations in the curbside system would be approximately $26,000 per year (collection, haul and transfer). Larger facilities would be required to arrange for private collection (carts or bins) of the recyclables.

Under this third option, curbside IC&I recyclables would be directed to the transfer facility and managed in a similar fashion as the residential materials. Large loads of clean material streams (OCC, mixed paper fibre etc.) collected from the larger generators would be directed to the current CTWMB MRF as this facility is more than capable of processing and marketing these larger loads of materials. The City would have to negotiate an appropriate cost to process IC&I recyclables at the MRF. Current program costs (approximately $93,000 per year) are to collect materials from the depots and process them at the MRF. The City and the CTWMB would have to determine the real cost of processing up to 1,500 tonnes of IC&I materials through the MRF. It would be reasonable to assume that this could cost in the order of $100,000 per year or less. To support this system, the City could enact a by-law requiring recycling of materials by all IC&I generators and/or banning loads including 5% or more of recyclable materials from the landfill. It is estimated that in the order of 1,700 tonnes of recyclables or more per year could be diverted through such a system. Somewhat

lower diversion rates reflect that this option does not provide a uniform level of service across the IC&I sector and that it is difficult to actually enforce mandatory recycling by-laws.

A fourth option would be not to offer collection services to any IC&I facilities, but to offer to offer an expanded service to process and market the recyclables at the current MRF at no charge to IC&I customers. This would be somewhat of a continuation of the status quo except that the City would still enact a by-law requiring that all IC&I generators participate in recycling. Essentially, the City would incur costs to process and market IC&I recyclables while the IC&I sector would have the option of either hauling their materials at no cost to the MRF or to contract for removal of materials. It is estimated that in the order of 1,000 tonnes of recyclables or more per year could be diverted through such a system. Lower diversion rates reflect that this option does not provide any collection service to the IC&I sector and that it is difficult to actually enforce mandatory recycling by-laws.

Table 37 summarizes the advantages and disadvantages between these options.

Table 37 Advantages and Disadvantages of IC&I Recycling Options

Option	Advantages	Disadvantages
IC&I Option 1: Status Quo, no Municipal Collection, some Municipal Processing	• Lowest cost to the City. Actual costs to process IC&I materials at current MRF is not quantified. • Uniform level of service • does not compete with private sector collection service	• Minimal actual service offered to IC&I sector • Majority of recyclables will be discarded with garbage for convenience. • Low diversion rate. Estimated that approximately 100 tonnes (of the 500 tonnes per year currently diverted) is diverted by the IC&I sector each year. • Significant consumption of landfill capacity
IC&I Option 2: Municipal Curbside Collection for the full IC&I Sector	• Uniform level of service. • High level of convenience to IC&I sector • Likely highest IC&I diversion rate (40%) and tonnages captured under this option (up to 2,300 tonnes per year) • Significant reduction in landfill capacity requirements	• Costs, in the order of $300,000 to $400,000 per year. IC&I materials not covered by current WDO funding program. • Competes with private sector service providers
IC&I Option 3: Combination of Municipal Curbside and Private	• Good level of convenience	• Costs in the order of

Option	Advantages	Disadvantages
Sector Cart/Bin Collection	for IC&I sector, should meet needs for various locations • Good diversion rate (30%) and tonnages (1,700 or more) captured under this option • Significant reduction in landfill capacity requirements • Accommodates smaller facilities that may not afford private sector service and does not compete with private sector in servicing larger facilities	$130,000 per year, depending on negotiating a processing cost with the CTWMB • Non-uniform level of service, (however some level of service offered to all IC&I locations) • Diversion rates not as high as IC&I Option 2
IC&I Option 4: Mandatory Recycling, implemented through Private Collection and Municipal Processing	• Uniform level of service. • Reasonable diversion rate (20%) and tonnages (1,000 or more) captured under this option • Some reduction in landfill capacity requirements • does not compete with private sector collection service	• Costs in the order of $100,000 per year, depending on negotiating a processing cost with the CTWMB • Diversion rates not as high as Options 2 and 3

8.0 Identification of an Enhanced Recycling System

There are several considerations other than direct collection and processing costs that should be considered when deciding whether or not to modify or change the City's approach to collecting and managing wastes generated in Temiskaming Shores. These tend to reflect indirect costs or environmental / social considerations and include:

- The ability to minimize overall or integrated waste management system costs considering:
  - 'Blue Box' recyclables processing costs;
  - revenues from recyclables collected;
  - landfill savings; and,
  - program promotion and education cost implications.
- The ability to maximize program participation and waste diversion considering:
  - existing public perception;
  - convenience to user;

  - frequency of collection; and,
  - net impact on material recovery.
- Other social, environmental, and technical considerations including:
  - disruption to the general public or specific communities / establishments;
  - environmental impact; and,
  - flexibility to manage changes in set-out patterns, material quantities/types, etc.

Table 38 below compares the various systems under consideration for each of these factors and identify where system advantages and disadvantages exist. It should be noted that all system advantages and disadvantages are relative to the 2008 baseline scenario. Some commentary is also provided where a particular system stands out among all other systems under consideration.

Table 38 Comparison of Enhanced Recycling System Options

	Option 1:Status Quo Residential-Depot IC&I – MRF/Depot	Residential			IC&I		
		Option 2: Expanded Depot System	Option 3 a): Bi-Weekly Curbside collection (2 stream or single stream) for SFDs and cart/bin service for larger MFDs.	Option 3 b): Monthly Curbside collection (single stream) for SFDs and cart/bin service for larger MFDs.	Option 2: Curbside Collection for all IC&I Sector	Combination of Municipal Curbside and Private Sector Cart/Bin Collection	Mandatory Recycling, Private Sector Collection Service, Municipal Processing
Summary of System Costs							
Net System Cost	$ 92,000	Approx. $ 95,000	Approx. $151,000	Approx. $112,000	Approx. $330,000 to $390,000	Approx. $128,000	Approx. $100,000
Cost/Tonne (Net of funding)	$186.51	$187 (minimal change from status quo)	$187 to $192	$ 142 to 148	$143 to $168	$74	$86
Economic Effects							
Collection Costs	n/a	Minimal change	$82,000 to $88,000	$53,000 to $59,000	$82,000 to $88,000	$8,000 to $9,000	n/a
Blue Box Processing Costs	n/a	Same as Current	$25,000 to $32,000	$25,000 to $32,000	$75,000 to $93,000	$100,000 (contingent on negotiations with CTWMB0	$100,000 (contingent on negotiations with CTWMB0
Haul and Transfer Costs	n/a	n/a	$113,000	$94,000	$257,000 to $297,000	$19,000 to $20,000	n/a
Landfill Capacity Savings	n/a	Minimal	400 tpy, 10,000 tonnes over 25 years	400 tpy, 10,000 tonnes over 25 years	2,300 tpy, 57,500 tonnes over 25 years	1,740 tpy, 43,500 tonnes over 25 years	1,160 tpy, 29,000 tonnes over 25 years
Promotion & Education	n/a	Minimal	Required, $10,000 year 1 costs	Required, $10,000 year 1 costs	Required, $2,000 in year 1 costs	Required, $1,000 in year 1 costs	Required, $1,000 in year 1 costs
Social/Environmental Effects							
Social Disruption	n/a	Minimal	All residents to participate, should be perceived as positive	All residents to participate, should be perceived as positive	All IC&I sector generators to participate, should be perceived as positive.	Non-uniform service approach may not be well received.	Lack of collection service for any sector may not be well received.
Convenience to user	low	low	High	High	High	Non-uniform, more convenient for some users	Uniform, not as convenient for users
Frequency of Collection	n/a	n/a	Bi-weekly	Monthly	Weekly	Weekly for those with curbside service	n/a
Maximum Material	500 tpy, 5%	Approx. 400 tpy,	Approx. 800 tpy,	Approx. 800 tpy, 20	Approx. 2,300 tpy, 40%	Approx. 1,750 tpy, 30%	Approx. 1,150 tpy, 20%

	Option 1:Status Quo Residential-Depot IC&I – MRF/Depot	Residential			IC&I		
		Option 2: Expanded Depot System	Option 3 a): Bi-Weekly Curbside collection (2 stream or single stream) for SFDs and cart/bin service for larger MFDs.	Option 3 b): Monthly Curbside collection (single stream) for SFDs and cart/bin service for larger MFDs.	Option 2: Curbside Collection for all IC&I Sector	Combination of Municipal Curbside and Private Sector Cart/Bin Collection	Mandatory Recycling, Private Sector Collection Service, Municipal Processing
Recovery	overall waste diversion	10 to 14% residential diversion, 5% overall waste diversion	20 to 25% residential diversion, approx. 10% overall waste diversion	to 25% residential diversion, approx. 10% overall waste diversion	IC&I diversion, 24% overall waste diversion	IC&I diversion, 18 % overall waste diversion	IC&I diversion, 12% overall diversion
Environmental Impact	n/a	No change	Positive, savings in resources, reduced landfill consumption etc.	Positive, savings in resources, reduced landfill consumption etc.	Very Positive, savings in resources, reduced landfill consumption etc.	Positive, savings in resources, reduced landfill consumption etc.	Positive, savings in resources, reduced landfill consumption etc.
Flexibility of System	n/a	Minimal	Collection schedule and containers provide flexibility to adjust to peak periods. Tied to external processing BUT could have arrangement with CTWMB for contingencies.	Collection schedule and containers provide flexibility to adjust to peak periods. Tied to external processing BUT could have arrangement with CTWMB for contingencies.	Not as flexible. Significant resources incurred to provide both collection and processing infrastructure. Tied to external processing capacity. Could have arrangement with CTWMB for contingencies	More flexibility. IC&I locations with smaller quantity of recyclables have curbside option. Larger generators have option for direct haul or contracted services. Not significantly tied to external processing capacity.	Somewhat flexible. IC&I locations with smaller quantity of recyclables may opt to set out materials as part of residential collection or direct haul to MRF. Larger generators have option for direct haul or contracted services. Not significantly tied to external processing capacity.
Political/Public Perception	n/a	Neutral, minimal potential for positive change, however, minimal change in cost	Potentially positive, increased diversion and convenience, however also some increase in cost	Positive, increased diversion and convenience, minimal increase in cost	Neutral or Positive, increased diversion and convenience, however also significant increase in cost	Neutral or Positive, increased diversion, and moderate increase in cost. However, not uniform service level.	Neutral or Positive, increased diversion, moderate increase in cost and uniform service level, although not as convenient for smaller generators.

9.0 Preferred System Overview

Based on the analysis presented in this report, the enhanced recycling system that would best suit the needs and requirements of the City would appear to be a combination of:

- Residential Options 3 a) or b). Determination of the final system configuration would be contingent upon securing processing capacity.
- IC&I Options 3) or 4).

However, prior to completing the discussion of the preferred system overview, the various options and findings of the study to-date will be discussed with the TAC.

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