



# The City of Red Deer

## Integrated Solid Waste Management Master Plan (WMMP)



**sonnevera**  
international corp.



**Council Update  
of Draft Report**

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## 1 Introduction

In January 2012, sonnevera international corp. (sonnevera) was contracted by The City of Red Deer to develop an updated Waste Management Master Plan (WMMP) to establish a strategic direction and planning framework for waste management in Red Deer for the next 25 years. This resulting WMMP provides a detailed work plan for the next ten years that focuses on achieving the mandate set forth by The City of Red Deer's Waste Management Section: to collect and dispose solid waste in an environmentally responsible manner, with emphasis on recycling and reuse where feasible. The plan works towards this mandate, while building on the successes of the current waste management system.

### 1.1 Council Vision

In April 2012, City Council attended a workshop to provide input into the process to update Red Deer's WMMP. As a result of their input, the following vision and objectives for the Plan were developed:

Vision:

*Red Deer's WMMP will provide strategic and detailed direction to reduce the per capita amount of waste sent to landfill through waste reduction and diversion initiatives that can be supported by the residents and businesses through their actions and choices. The plan aims to make Red Deer a recognized provincial leader in sustainable waste management.*

Objectives:

- *Encourage and support waste minimization behaviours;*
- *Recognize that convenience and accessibility are critical to maintaining community support;*
- *Create measurable environmental benefits, such as decreasing the annual per capita disposal rate;*
- *Support sustainable waste management on a regional level; and*
- *Optimize diversion potential and cost to derive the best value.*

## 2 Background

The Waste Management Master plan's vision, based on Council direction, is to provide strategic and detailed direction to reduce the per capita amount of waste sent to landfill through waste reduction and diversion initiatives that can be supported by the residents and businesses through their actions and choices. The plan is the fourth in a series of Solid Waste Master Plans that were initiated in 1992, and aims to make Red Deer a recognized provincial leader in sustainable waste management. Consistent with the plan's vision, Red Deer's Environmental Master Plan, adopted in 2011, includes a goal to decrease the amount of waste going to landfill and increase waste diversion opportunities.

The City operates a successful waste management service that includes collection of recycling, yard waste and garbage, and a state-of-the-art waste management facility. With the growth of the city, as well as public expectations for progressive environmental programs and services, The City strives to have its solid waste programs and services meet community expectations. It is with this in mind that The City conducts annual customer surveys and regularly reviews and updates its WMMP, and has developed an Environmental Master Plan (EMP) to serve as a roadmap to improve the city's sustainability, including specific goals for waste management. These existing documents serve to frame the development of the



new WMMP – from the identification of successes and opportunities for improvement to establishing long-range targets for the performance of the waste management system.

## 2.1 Methodology

During the development of this WMMP, several tasks were completed to define the recommendations for Red Deer's future waste management system. Those tasks included:

- Gathering and reviewing existing historical reports and data on solid waste management in Red Deer
- Site visits to the major solid waste facilities
- Participating in residential and commercial garbage and recycling collection services
- Interviews with key stakeholders
- A workshop with City of Red Deer's staff involved in solid waste management
- Waste audits at the landfill
- An on-line survey for businesses
- Site visits and waste audits at randomly selected businesses and institutions
- Consultation meetings with a variety of stakeholders including:
  - The Downtown Business Association
  - Red Deer Home Builder's Association
  - Red Deer Construction Association
  - Environmental Advisory Committee
  - ReThink Red Deer
  - Service providers
  - City staff from various departments
- Compiling and assessing best management practices for application to Red Deer
- Preparing a comparative assessment of solid waste programs in other Alberta municipalities
- Reviewing the results of The City's Customer Satisfaction Surveys
- Review of The City's solid waste management budget

The stakeholder consultations were conducted on an individual and group basis to determine potential barriers, opportunities and customer needs. The waste stream analyses and visual audits provided insight into trends specific to Red Deer and allowed diversion potential to be estimated. A review of best practices in communities similar to Red Deer identified potential approaches that could be implemented in Red Deer, including economic incentives, regulatory mechanisms and voluntary measures.

The recommended options presented in this document were selected based on a thorough understanding of the current system, preferences identified during stakeholder consultation and their success in comparable jurisdictions. The selection of options also considered The City's Environmental Master Plan and waste management strategy.

## 3 Public Consultation

As part of finalizing the Waste Management Master Plan (WMMP), a program of public consultation is proposed for early 2013, including the following:

- Consultations with the commercial sector, including Chamber of Commerce and Downtown Business Association
- Consultations with waste management contractors

- Public information booths at the Red Deer Home Show and other venues
- On-line feedback form

Events will be promoted through a variety of methods, to inform residents of the opportunities available to provide feedback on the Plan. These activities provide an opportunity to inform residents about the Plan as well as an opportunity to solicit public input.

## 4 Waste Characterization and Potential Diversion

### 4.1 Disposal, Diversion and Waste Generation

In 2011, 74,622 tonnes of waste from the City of Red Deer were disposed at the Red Deer Waste Management Facility landfill. This translates to a disposal rate for the City of Red Deer in 2011 of 812 kg per capita, which compares to a Canadian average of 777 kg per capita, or an Alberta average of 1,122 kg per capita (Stats Can, 2010).

The estimated breakdown in waste by source, as tracked at the Waste Management Facility, is shown in Figure 1.

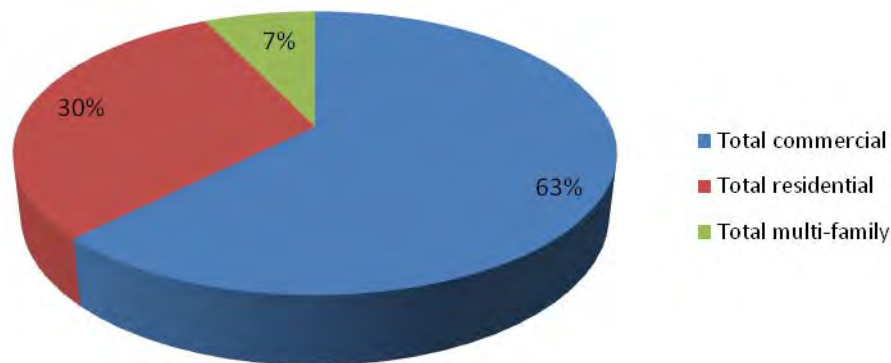
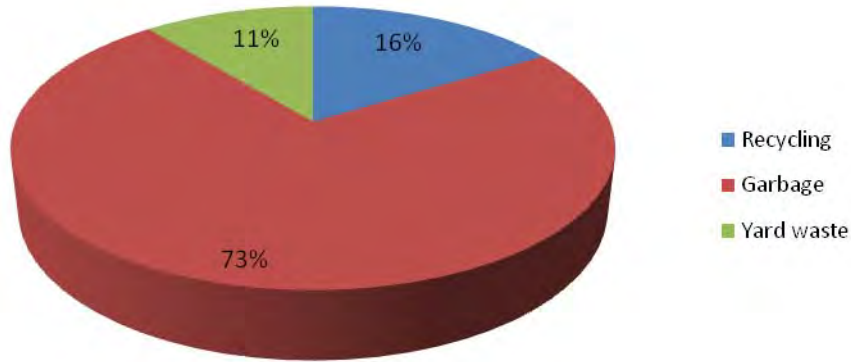


Figure 1: Origin of Red Deer waste

It is unknown how much waste material is diverted from the commercial sector through recycling, as this activity occurs in the private sector, and no reporting mechanism exists with The City. However, average commercial recycling rates according to Stats Can are approximately 11% for Alberta. Assuming this average applies to Red Deer would suggest diversion of approximately 5000 tonnes of recyclables in the commercial sector.

At the same time, roughly 25,000 tonnes of materials were collected through the single-family residential garbage, recycling and organics collection programs in 2011. Figure 2 shows the relative quantity of materials collected in each stream, based on measurements.



**Figure 2: Breakdown of Residential Waste Excluding Multi-Family Buildings in 2011**

Approximately 22,600 tonnes of residential solid waste are disposed at the Red Deer Waste Management Facility, which includes 16,600 tonnes collected curbside from single-family residences, with the remaining materials delivered to the Waste Management Facility by residents. This translates to a residential per-capita disposal rate of 246 kg per capita, which compares to a Canadian residential average of 259 kg per capita and an Alberta average of 273 kg per capita (Stats Can, 2010).

#### 4.2 Potential Diversion

As shown through waste audits, the largest components of the residential waste stream are organic waste (37%), paper products (20%), and plastics (12%). These waste composition values were applied to Red Deer’s total residential curbside waste collection (16,500 tonnes) to produce theoretical potential additional diversion values for various components of the waste stream, as shown in Table 1, along with actual diversion for each category.

**Table 1: Estimated City of Red Deer Residential Diversion Potential**

	Current Diversion 2010 (tonnes)	Additional Diversion Potential (tonnes/year)
ONP*	2400	1650
Other Paper**	1464	1650
Glass	101	150
Metal	119	500
Plastic	112	1900
Yard Waste	3400	3700
Food Waste	0	2500
Total	7,596	12,050

\*ONP – Old Newspaper

\*\*Other Paper includes cardboard

There is no detailed waste composition information available for Red Deer’s commercial waste stream, so provincial commercial waste analysis information were applied to Red Deer’s total estimated commercial waste generation (46,500 tonnes) to produce theoretical potential diversion values for the commercial sector, as shown in Table 2.

**Table 2: Estimated City of Red Deer Commercial Diversion Potential**

	<b>Current Diversion 2010 (tonnes)</b>	<b>Additional Diversion Potential (tonnes/year)</b>
Cardboard	unknown	12,500
Other paper	unknown	12,500
Food waste	0	7000
<b>Total</b>		<b>32,000</b>

## 5 Waste Management Strategy

### 5.1 Waste Reduction, Diversion and Residuals Management Elements

The following strategy elements, outlined in Table 3, for enhanced programs and increased diversion have been identified for The City of Red Deer, based on needs and opportunities identified, research into best practices, and initial feedback from stakeholders.

**Table 3: Waste Management Strategy Elements**

<b>Option Type</b>	<b>Option</b>
Education / Promotion Overall Approaches	<p>Government leadership</p> <ul style="list-style-type: none"> <li>Review and update internal procurement policy to encourage reduction, reuse and recycled content.</li> <li>Develop a consistent comprehensive waste diversion program for all public buildings and operations.</li> </ul>
	<p>Community engagement</p> <ul style="list-style-type: none"> <li>Develop a community engagement plan to promote waste reduction and diversion initiatives and leverage existing environmental networks.</li> </ul>
	<p>Community-based social marketing</p> <ul style="list-style-type: none"> <li>Continue to build internal capacity in community-based social marketing, and integrate these approaches into all program designs and implementation.</li> <li>Expand marketing efforts for existing programming to improve participation and address specific behaviour issues.</li> <li>Initiate a cooperative design process between The City and contractors for recycling infrastructure to improve consistency in bin design, colours and signage.</li> </ul>
	<p>Branding</p> <ul style="list-style-type: none"> <li>Develop a Red Deer brand that provides a consistent program look and messaging throughout City waste reduction initiatives.</li> </ul>
	<p>Social Media</p> <ul style="list-style-type: none"> <li>Investigate SmartPhone apps that can help to remind residents of waste management services and diversion opportunities.</li> <li>Enhance The City's website to provide more information related to The City's waste reduction and waste management services, and incorporating more interactive features.</li> </ul>



Option Type	Option
	<p><b>Public spaces recycling</b></p> <ul style="list-style-type: none"> <li>• Pilot new and improved signage at existing public recycling bins, including assessment of participation and contamination levels, as well as an advertising campaign.</li> <li>• If the pilot is successful, all litter bins in public spaces should be replaced with multi-stream bins, and supported by ongoing promotional activities.</li> </ul> <p><b>Zero waste public events</b></p> <ul style="list-style-type: none"> <li>• Prepare a “zero waste event” guide for event organizers that provides tips on how to minimize waste at events and identifies local waste management resources and services.</li> <li>• Require event organizers to prepare a waste management action plan including waste reduction and diversion elements as part of special events permits.</li> <li>• Provide highly visible garbage and recycling containers to public events that are consistent (colours, signage) with other public space and municipal recycling initiatives.</li> </ul>
Residential Waste Reduction/ Diversion	<p><b>Backyard composting</b></p> <ul style="list-style-type: none"> <li>• Build upon the Composting at Home program through enhanced education and initiatives like subsidized composter sales to promote backyard composting throughout residential areas of Red Deer.</li> </ul> <p><b>Grasscycling and xeriscaping</b></p> <ul style="list-style-type: none"> <li>• Develop a grasscycling and xeriscaping awareness campaign linked to existing and future environmental campaigns related to healthy yards, water conservation and backyard composting.</li> </ul> <p><b>Expanded residential organics collection</b></p> <ul style="list-style-type: none"> <li>• Implement a year-long pilot of expanded residential organics collection to include food waste and soiled paper, testing combined yard and food waste, as well as separated collection over four seasons.</li> <li>• Utilizing results from the pilot, if deemed successful, implement community-wide residential organics collection.</li> </ul> <p><b>Bi-weekly garbage collection</b></p> <ul style="list-style-type: none"> <li>• Combine pilot of bi-weekly garbage collection with expanded organics pilot.</li> </ul> <p><b>Enhanced Curbside Recycling</b></p> <ul style="list-style-type: none"> <li>• Enter into negotiations with the MRF’s operator to determine capabilities regarding collection of an expanded range of plastics. If positive, expand materials accepted in the blue box to all mixed container plastics and film.</li> <li>• Implement a pilot residential blue cart collection program.</li> <li>• Due to the larger volume that can be accommodated in a cart, If automated carts are expanded for use at all homes, bi-weekly collection of recycling should be considered.</li> </ul> <p><b>User-pay / volume limitations</b></p> <ul style="list-style-type: none"> <li>• An initial reduction of the can limit from its current rate down to 3 containers per week should be considered, followed by a subsequent reduction down to 2 containers. Implementation of a container reduction could be introduced at the same time as new recyclables are added to the program.</li> </ul>



Option Type	Option
	<p>Enhanced multi-family programming</p> <ul style="list-style-type: none"> <li>• Work with the recycling contractor to develop a targeted multi-family social marketing program.</li> <li>• As a launch to the campaign, provide in-suite recycling containers.</li> </ul>
<p>Industrial, Commercial and Institutional Waste Reduction</p>	<p>Waste diversion assistance</p> <ul style="list-style-type: none"> <li>• Provide technical and information assistance to businesses and institutions that want to implement waste diversion programs.</li> </ul>
	<p>ICI recognition</p> <ul style="list-style-type: none"> <li>• Develop a recognition program for businesses achieving high standards in waste diversion.</li> </ul>
	<p>ICI food waste diversion</p> <ul style="list-style-type: none"> <li>• Initiate a pilot ICI food waste collection program, including promotion and education materials and training of staff at participating businesses, to identify specific opportunities and barriers to success.</li> <li>• Incorporating results from the pilot, introduce a community-wide promotion of ICI food waste collection service options.</li> <li>• Clarify the Utility Bylaw's application to commercial organics collection services.</li> <li>• Support ICI locations that want to implement on-site composting.</li> </ul>
	<p>Enhanced ICI recycling collection</p> <ul style="list-style-type: none"> <li>• Work with contractors to design and implement alternate collection options for businesses in areas that present challenges to effective participation in diversion programs.</li> <li>• Consider providing municipal buildings with recycling services as an add-on to the multi-family recycling program</li> </ul>
	<p>Expanded C&amp;D diversion opportunities</p> <ul style="list-style-type: none"> <li>• Expand the pallet recycling program to include all clean (uncoated) wood waste.</li> <li>• Assess the potential benefits of adding aggregate diversion opportunities at the Waste Management Facility.</li> </ul>
<p>Infrastructure Enhancements</p>	<p>Automated cart-based garbage collection</p> <ul style="list-style-type: none"> <li>• Implement a pilot automated garbage collection program.</li> <li>• If the pilot is deemed successful, expand automated garbage collection community-wide.</li> <li>• If automated collection is implemented full-scale, consider offering residents variable can sizes to further enhance the user pay concept and create a financial incentive to maximize diversion.</li> </ul>
	<p>Organics processing facility</p> <ul style="list-style-type: none"> <li>• If a composting facility is deemed to be required to process residential and ICI food waste, conduct a composting feasibility study to determine technology, size and location of suitable processing facility.</li> </ul>
<p>Regulatory Options</p>	<p>Differential tipping fees</p> <ul style="list-style-type: none"> <li>• Create a financial incentive for diverting recyclable and compostable materials through a system of differential tipping fees at the Waste Management Facility.</li> </ul>



Option Type	Option
	<p>Disposal bans</p> <ul style="list-style-type: none"> <li>Consider implementation of disposal bans for waste materials that have an existing collection and processing infrastructure in place.</li> </ul> <p>Residential mandatory recycling / source separation</p> <ul style="list-style-type: none"> <li>If promotion and education and financial incentives such as pay-as-you-throw garbage collection do not provide the desired level of residential program performance, implement curbside collection bans for all organics and recyclables that are part of both programs.</li> </ul> <p>ICI mandatory recycling / source separation</p> <ul style="list-style-type: none"> <li>Once adequate alternatives exist for ICI organics and recyclables, if ICI diversion expectations are not met, require all businesses to participate in diversion programs.</li> </ul>
Residuals Management	<p>Site development</p> <ul style="list-style-type: none"> <li>Prepare and implement an integrated Design and Operations Plan for the landfill site, with provisions for minor updates every five years.</li> <li>Develop a long-term capital cost plan which provides capital costs of all landfill related infrastructure projects and progressive closure costs.</li> </ul> <p>Airspace consumption</p> <ul style="list-style-type: none"> <li>Implement annual topographical plans generated from aerial survey data. Based on the annual topographical plan, undertake an annual airspace consumption analysis.</li> </ul> <p>Operational considerations</p> <ul style="list-style-type: none"> <li>Consider seasonal use of alternative daily cover at the site.</li> <li>Review the terms of reference of the operations contract to ensure that it contains appropriate performance criteria.</li> </ul>
Monitoring and Reporting	<ul style="list-style-type: none"> <li>Implement a comprehensive reporting system that provides the level of material breakdown to evaluate performance in different sectors.</li> <li>Conduct on-site and load audits to assess breakout of waste from various sectors.</li> <li>Carry out surveys at recycling depots to determine relative usage by commercial vs. residential sectors, as well as residents from outside Red Deer.</li> <li>Request reporting of diversion amounts from the commercial sector, including businesses that direct ship materials out of the city, as well as total collection volumes from contractors.</li> <li>Incorporate environmental benefits calculations into the reporting system.</li> </ul>

## 6 Prioritization

### 6.1 Ranking of Program Elements

Figure 3 shows a graphical representation of the relative ranking of program elements within the Waste Management Strategy, using diversion and cost as primary indicators, supported by ease of implementation of various options. Although all program elements are recommended, this provides a foundation for decisions that will need to be made if budget does not allow for full implementation of all components. It is important to note that some elements, such as Community-Based Social Marketing and Government Leadership, are considered to be fundamental to the successful implementation of the strategy as a whole. Supporting elements, such as reporting and infrastructure, that do not offer independent diversion, are not included, but are required system components.

As can be seen in Figure 3, the options that offer the greatest diversion at the lowest cost are located in the top left quadrant. Some of these elements (mandatory recycling, disposal bans) are anticipated to encounter public resistance, and therefore have been recommended only as alternatives implemented after more readily accepted options have been fully implemented and failed to reach diversion goals. However, there are options in this high-performing quadrant that are predicted to be relatively easy to implement, including Waste Diversion Assistance and Differential Tipping Fees. Therefore, these options are recommended for early adoption in the strategy.

Also evident in the figure is the observation that a significant number of options are located in the quadrant representing low-cost, but low-diversion options. Many of these elements are also predicted to be relatively easy to implement. Therefore, despite their lower diversion potential, these options are worth implementing because of their likelihood of community support, as well as the supportive role they can play within the overall strategy. At the same time, options with low diversion, but higher cost may be considered for a delayed implementation in the event that budget limitations prevent full implementation of all components.



## 7 Estimated Diversion and Targets

Figure 4 below provides a visual representation of diversion throughout the implementation of the strategy, as well as the corresponding reduction in waste generation rate, with proposed waste targets (see also Table 4) highlighted, with an ultimate target of 500 kg/capita in 2022.

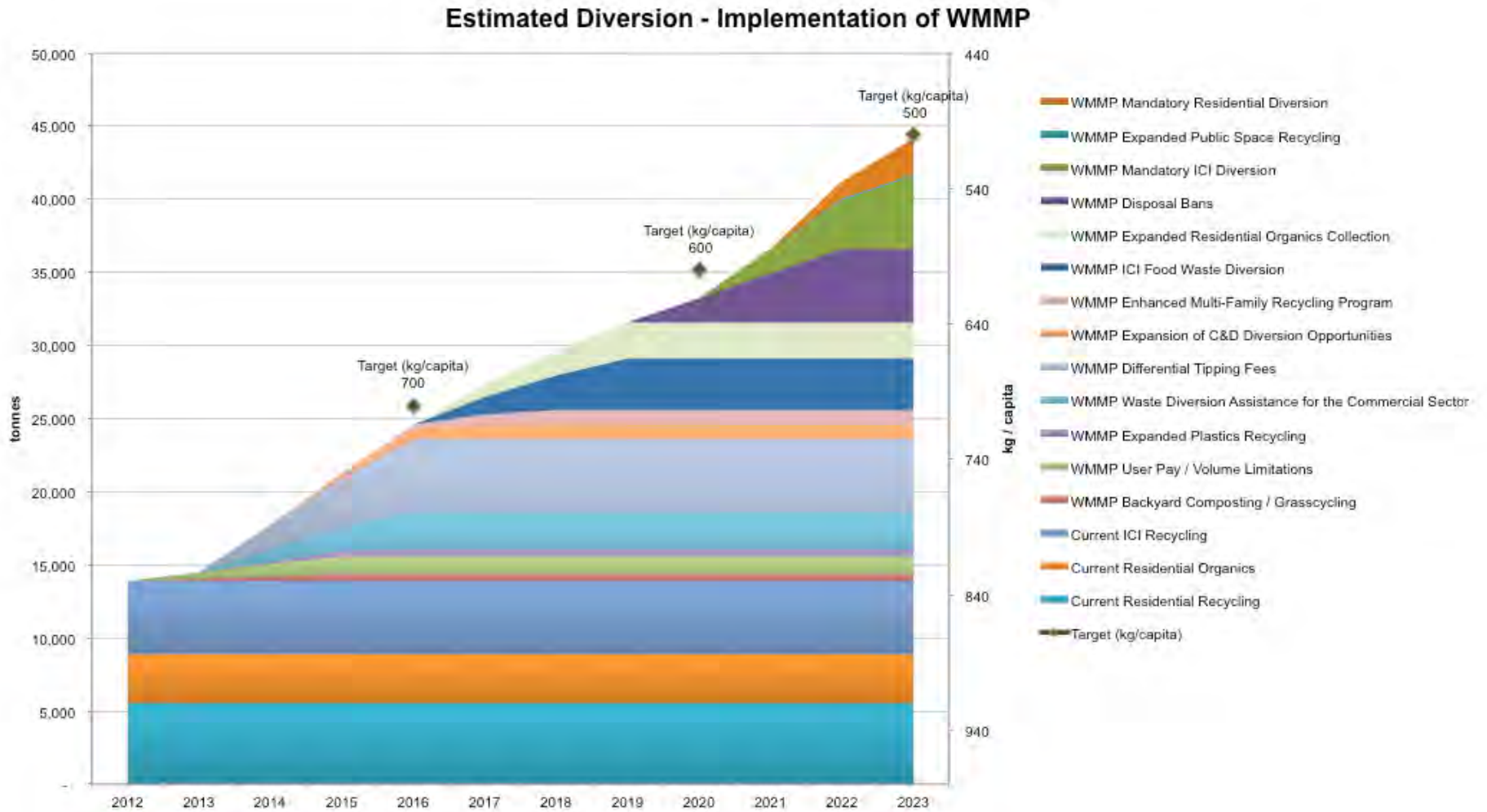


Figure 4: Estimated Diversion – Implementation of Strategy



The following are proposed targets based on the diversion strategy presented in this Plan. Residential waste is proposed to be measured on a per residential curbside account, rather than per capita, to compensate for changes in residential demographics that may see increased numbers of residents living in multi-family residences, or other such community changes.

Because of the inherent measurement challenges associated with diversion rate targets, as well as The City's lack of information regarding rates of ICI diversion, a per-capita disposal rate has been presented as the overall waste system target metric. The ultimate target of 500 kg per capita represents a reduction of approximately 40% from current disposal amounts.

**Table 4: Proposed Waste Targets**

Metric	Baseline		Targets		
	2009	2011	2016	2020	2023
Annual kg of garbage per residential curbside program account	620	610	550	450	400
Overall per-capita disposal rate (kg/capita)		812	700	600	500