



Best Practices Review

Prepared for:

Waste Diversion Ontario

Continuous Improvement Fund Office
92 Caplan Avenue, Suite 511
Barrie, ON L4N 0Z7

Prepared by:

Stantec Consulting Limited

3430 South Service Road, Suite 203
Burlington, ON L7N 3T9

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1 STUDY OVERVIEW

In May 2009 CDN Research Associated Inc. (CDN) compiled a series of documents on behalf of Waste Diversion Ontario related to best practices for the collection of recyclable waste in open spaces. Stantec Consulting Limited, in August 2009 was retained to review these documents to determine if best practices are identified in the literature, and if any additional work was required to prove activities as best practices.

Based on this review, Stantec was retained to evaluate and compile this information into a format that could be used as a basis for an open space recycling guide and funding policy for the WDO.

The purpose of this review was to:

- Develop a list of defensible best practices for open space recycling; and,
- Create a list of open space recycling activities that require further study before they can be defined as best practices.

For the purposes of this assessment, open spaces include parks, trails, beaches, outdoor sports facilities etc, where permanent waste collection installations are appropriate but do not include “special events” such as festivals and concerts, although the practices identified in this document could be applicable to these special events.

2 BEST PRACTICES FOR OPEN SPACE RECYCLING

The following is a list of best practices for open space recycling based on the material collected by CDN.

2.1 Best Practice #1: Clear and Consistent Signage

Clearly indicating the types of waste to be deposited in each collection bin is critical to achieving increased diversion rates and low rates of contamination. It is important to remember that an individual may not be aware of recycling practices in each community as he/she may not be local or may not actively participate in a recycling program. This fact is particularly true around sports complexes, ball diamonds and soccer pitches frequented by ‘out of town’ visitors.

Graphics, text, and colour are all key elements in communicating which materials should be deposited in the bin. Unambiguous graphics (e.g. photographs and realistic images) coupled with text improves user understanding as the graphic is attention grabbing and the text provides confirmation of the correct material category. For instance, the mobius loop is a well understood symbol for recycling and should be utilized in signage. SPI plastic codes are not

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recommended as they are not familiar to all users, are increasingly unrepresentative of what can and cannot be recycled in typical Blue Box programs, and are often not present on containers.

Observational surveys show that residents spend less than five seconds on average examining waste management advertisements. Therefore complex messaging will not work. These issues may lead to confusion and decreased diversion rates. Signs should be placed on the front, tops, and sides of bins that are accessible to the user. Standard signage throughout the parks and open space should be used to relay a consistent message to users. Overhead signs are considered a best practice to increase visibility of receptacle stations.

Concise messaging is more likely to result in properly sorted waste. Use the label names: Garbage, Recycling and Green Bin (or Green Cart depending on the name of your organics program). Text should be written in reverse colour versus the signage background (i.e. white letters on coloured background). Avoid using too many words on the signs. Advertising standards suggest using a maximum of eight words per advertisement, varying the font size, not using all capital letters, avoid stacking text, using non-decorative style font and not using black text on white backgrounds. People tend to ignore signage with black text on white backgrounds because it is commonly used, for example in newspapers.

Best Practices for effective signage for open space recycling programs include:

- Use realistic, simple, high quality graphics or photographs of acceptable materials;
- Include the mobius loop;
- Positive reinforcement of acceptable material (i.e. do not list unacceptable materials);
- Use a minimal amount of text. Use a maximum of eight words per sign;
- Vary the font size, don't use all capital letters. Use a non-decorative style (i.e. use Arial versus New Times Roman) to increase readability. Avoid stacking text on top of each other, instead use a single horizontal line of copy;
- Use symbols rather than text whenever possible to communicate in multilingual communities;
- Use a white font on a coloured background to increase readability;
- Coordinate colour of signage to residential diversion programs (i.e. blue colour of signage for recycling bins);
- Identify items that may be a source of confusion for users e.g. Tim Horton's cups;
- Use a slogan which can be incorporated into additional signage;
- Place signage on container so as not to be obscured by inside plastic liner;
- Avoid putting too many images and words together on the signage;

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- Provide signage throughout open space directing users to containers; and,
- Place signage on sides, front, on top and above containers.

2.1.1 Supporting Case Studies

Location	Case Study Details
New South Wales, Australia, 1998	In 1998 the New South Wales Waste Boards determined that there was a lack of waste collection sign standards, and so commissioned a company to develop a standard set of signs and labels. After conducting extensive research on appropriate pictures, photos, words, images, and symbols, the consulting company determined the most effective signage included realistic yet simple drawings of the items permitted to be deposited within each bin. The mobius loop was also depicted on each sign and text was written in reversed colour (i.e., white letters on a coloured background). ¹
Royal Botanical Gardens, Sydney, Australia, June 1999	The Royal Botanical Gardens in Sydney, Australia, established a permanent public space recycling system after the completion of a trial system. Aluminum cans, glass containers and non-recyclable garbage were collected in 240L bins at 27 different stations. The bins were coloured and signed according to the New South Wales colour-coding system. The recycling bins also had restrictive holes. A waste audit completed in June 1999 showed that contamination in the aluminum and glass bins was high, however the contaminants were generally aluminum and glass placed in the incorrect bin. By combining the two streams, the level of contamination was reduced to 10%. The overall recovery rate was 80%. ²
Lane Cove National Park Sydney, Australia, 1996	After determining through a waste audit that 36% of the waste collected in Lane Cove National Park in Sydney was recyclable, the park introduced a public space recycling program. The current 200 44L metal pedestal bins were replaced with 15 recycling stations. The colour-coded and signed bins collected glass, aluminum cans, and PET plastic. The recovery rate after the installation of the new bins was 77% and the overall contamination rates was less than 1%. ³
Rest Area Recycling Program Evaluation, United States, 2001	<p>A Rest Area Recycling Program evaluation was undertaken in 2001 as part the fulfillment of a university course. The evaluation reviewed three different case studies of rest stop areas along highways in California, Ohio, and, Wisconsin. Through the study, it was determined that appropriate signage increased public awareness and helped to reduce contamination. In Wisconsin, high levels of contamination in the first year of their program promoted the installation of signs for the second year of the program. Since then, contamination rates have steadily declined.</p> <p>Not only were signs placed near the bins themselves, but they were also located in other highly visible areas. Wisconsin and California placed signs facing the parking lot, while Ohio indicated a rest stop had recycling bins on highways signs.⁴</p>

¹ Hyder Consulting. 2007. *Independent Assessment of Public Place Recycling Final Report.*

² Hyder Consulting. 2007. *Independent Assessment of Public Place Recycling Final Report.*

³ Hyder Consulting. 2007. *Independent Assessment of Public Place Recycling Final Report.*

⁴ Attardo, Catherine, et al. 2001. *State Rest Area Recycling Programs.*

Location	Case Study Details
<p>Regional Municipality of York, Ontario, Canada, 2008</p>	<p>In the spring of 2008 York Region partnered with the Town of Newmarket to pilot a three stream waste management system along the Tom Taylor Trail and in a neighbouring outdoor recreation complex. The objective of the pilot was to assess level of contamination in new containers, assess effectiveness of messaging, and identify operational challenges and potential solutions of the new system.</p> <p>The messaging developed for the container labels met the following criteria:</p> <ul style="list-style-type: none"> • Easy to recognize images; • Use of bright colours to attract attention; • Use of green, blue and black for organics, recyclables and garbage respectively; and, • Limit the use of wording. <p>Photographic images of common park waste were used on the labels to clearly show what materials are accepted in the three different streams. An information brochure was created to promote awareness in the community about the pilot. The slogan “<i>Make the Drop</i>” was created for the information brochure and park signage. Park signage was utilized in both test areas to promote and motivate park users to participate in the pilot.</p> <p>Three public surveys were conducted throughout the summer to assess different aspects of the pilot. The first survey asked a number of questions about the messaging used on the labels. Results of this survey found that the public preferred the label names of Garbage, Recycle, and Green Bin for the three waste streams being collected</p> <p>An informal survey conducted by the Region of York during the pilot confirmed that people spend less than five seconds reviewing signage on recycling bins in open spaces before deciding where to place their material(s). This survey was confirmed by observations made by the Town of Whitby in 2009.⁵</p>

2.2 Best Practice #2: Placement of the Recycling Bins

Placement, configuration, and layout of recycling receptacles are significant factors in promoting recycling and achieving a high rate of diversion. Strategically locating bins to capture the greatest amount of recycling should be done in consultation with park staff and other applicable stakeholders. A useful tool to determine where to locate bins can be to start with identifying areas with high traffic flow or activities that generate the greatest concentration of waste and/or litter.

⁵ Town of Newmarket and Regional Municipality of York. 2008. *Public Space Three Stream Waste Diversion Parks Pilot*.

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Recycling bins should be located within 3 to 14 metres apart to be the most effective. Providing this many bins in an open space may be cost prohibitive and unsightly. In this instance, use the above as a guideline and place bins using other principles identified in this section.

Commuter areas include those areas where people enter/exit public transit and busy streets/sidewalks. This type of area tends to generate a large amount of recyclables as beverages are consumed, newspapers are read, etc. as people wait for transit or walk. Open spaces located near densely populated areas capture more recyclables. Bins located on the exterior of the open space will capture a greater amount of material than those located in the interior.

Although it may seem logical to place bins in the vicinity of crowded areas, this may not always be the best choice. Bins located in areas of extreme crowding will be inaccessible and even difficult to locate. If a bin is not clearly visible, it significantly decreases the likelihood of its use.

Consideration should be given to accessibility for children and people with disabilities. Due to the complexity of issues involved with making open space recycling totally accessible, it is not the focus of this report.

Placing recycling bins in areas where people expect to find them will help increase diversion rates. Examples of these locations include near entrances and exits; near washrooms; in eating areas; and near walkways and intersections. Increased amounts of waste may also be generated near community centres, schools, and entertainment venues. Based on the experience of park staff, bins should be installed near areas that are known to generate increased amounts of waste.

Not only is location of the bins important, but so too is their juxtaposition. Bins should always be paired; a waste bin should always be placed with a recycling bin to avoid contamination. Bins should also be placed side-by-side and not back-to-back. If bins are placed back-to-back, users may not realize the recycling/waste bin is on the other side, possibly resulting in higher contamination rates and lower diversion rates. At least one recycling bin should be paired with the garbage bins. Additional recycling bins may be required depending on the amount of recyclable material generated. Effective monitoring of bin fullness and collection of materials to maintain capacity in the bins will be important to the effectiveness of the recycling program.

Best Practices for the placement of bins in open spaces for recycling programs include:

- Identify areas with high traffic flow or activities and waste generation and locate bins in those areas;
- Place bins near where people will expect them (e.g. near entrances/exits, washrooms, etc.);

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- Locate bins within 3 to 14 metres apart;
- Pair recycling containers with garbage containers on at least a 1:1 ratio; and,
- Place recycling containers beside garbage containers, not back at back.

2.2.1 Supporting Case Studies

Location	Case Study Details
Littering Behaviour Study, Community Change Pty Ltd, Australia, 2001	Research undertaken by Community Change in 2001 showed people are more likely to deposit litter/recycling in the proper receptacle if the receptacle is within 3.5 metres. Individuals at a beach would walk up to 17 metres to properly dispose of their waste/recycling. Based on this research, receptacles located within 3 to 14 metres of each other would be most effective. ⁶
City of Melbourne, Australia, 2003	<p>Since 2003, the City of Melbourne had installed more than 150 public place recycling bins in several popular parks. Bins were strategically located at key entrance/exit points and at major intersections, but placed in locations where they did not visibly interfere with the parks' landscapes. Communication with specific stakeholder groups addressed issues with litter in certain areas.</p> <p>Waste audits performed in the parks show a high percentage of recyclables are being recovered. Some parks have very low contamination levels of recyclables.⁷ (Note: no specific waste audit results were provided)</p>
City of Gosford, Australia, 2001	<p>The importance of placing a waste bin next to a recycling bin is illustrated in this example from Warringah Council and the City of Gosford.</p> <p>Warringah Council installed a number of recycling stations at two different beaches in 2000-2001. In addition to a recycling bin, each station included two or more garbage bins placed on either side of the recycling bin. All signage and colours were done in accordance with the New South Wales' standards. Bins were placed in locations where people commonly disposed of waste, including entrances and exits, near picnic tables, near washrooms, and next to walkways. To encourage the use of the new recycling stations, all waste bins in the picnic areas were removed and signs were placed on each table directed patrons to separate their recyclables from waste. The overall recovery rate was 83.1% and the overall contamination was 10.1%.</p> <p>The City of Gosford also placed new stations in several city parks and at a beach, however there was only one waste bin next to each recycling bin and, in some instances, there was no recycling bin by the waste bin. The signage for each bin conformed to the New South Wales' standards. Results of an audit showed more recyclables were placed in the stand-alone waste bins (25%) than in the waste bins next to a recycling bin (less than 10%). Contamination in the recycling bins was low, averaging 1.9%</p>

⁶ Sustainability Victoria. 2007. *Public Place Recycling Best Practice Guidelines*.

⁷ Sustainability Victoria. 2007. *Public Place Recycling Best Practice Guidelines*.

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Location	Case Study Details
City of Gosford, Australia, 2001 (cont'd)	<p>and recovery of recyclable materials in the bin stations was greater than 95%.</p> <p>Based on the audit results, it can be concluded that recycling and waste bins should be located next to one another.⁸</p>
Quinte West and Belleville, Ontario, Canada, 2005	<p>Quinte Waste Solutions wanted to test their hypothesis that less contamination occurs when a recycling bin is located next to a waste bin as opposed to separating the two bins. Two arenas, one in Quinte West and one in Belleville were chosen to test this theory. Both arenas had the same amount of promotional/education materials on walls and on entrance ways. The arena in Quinte West received side-by-side placement of garbage and recycling bins (12 garbage bins / 12 recycling bins). In the Belleville arena, recycling was only available at one-third of the garbage bins (34 garbage bins / 10 recycling bins). Waste audits showed the diversion rate in Quinte West was 54% while the diversion rate in Belleville was only 23%, indicating the side-by-side placement of garbage and recycling bins is most effective.⁹</p>
City of Melbourne, Australia. Date unknown.	<p>The Queen Victoria Market features two main food areas, the Food Court and the Deli Lane Outdoor Cafe. Seating available in the Food Court and Cafe are for 440 and 160 people, respectively. A comprehensive recycling program was already established for the market; however recyclables were not being properly disposed of at these two areas.</p> <p>Bins located within the Food Court had been installed 10 years previously and so were not designed to capture two waste streams. The location of the bins was poor as they were located in congested areas making access for patrons and cleaning staff difficult. After observing patron movements and considering the most convenient and accessible areas, three commingled bins were installed.</p> <p>The location of the bins in the Cafe was appropriate; however the signage on the bins was not sufficient. The confusing signage resulted in a high contamination rate as patrons were unsure of which bin was for waste and which was for recycling. The bins were re-signed using Sustainability Victoria standards, allowing for patrons to easily distinguish the bins from one another.</p> <p>Results from the Food Court waste bin renovations were positive; new bins and improved signage have diverted 44.6% of waste from the Food Court. Improvements at Deli Lane have also had a significant impact on improving recycling practices. Before the new signs were installed, contamination of the materials in the recycling bins was so great, it was all sent to landfill. Now, contamination is less than 10%.¹⁰</p>

⁸ Hyder Consulting. 2007. *Independent Assessment of Public Place Recycling Final Report.*

⁹ Quinte Waste Solutions. 2006. *“Recycle Away” Public Park, Sports Field, and Arena Recycling.*

¹⁰ Sustainability Victoria. 2007. *Public Place Recycling Best Practice Guidelines.*

Location	Case Study Details
New York City, United States, 2007	<p>A study conducted in 2007 in selected New York City parks and transit hubs evaluated the effectiveness of a pilot public space recycling program for paper and commingled metals, glass and plastic. The pilot program was implemented in six parks and two ferry terminals. Overall, the sites having the greatest amount of recyclables collected with the lowest contamination rate were those in the ferry terminals and in Union Square and Columbus Park. The ferry terminals are commuter sites and Union Square and Columbus Park are located within the vicinity of numerous subway exists, and therefore can be similarly classified. Union Square and Columbus Park are located in dense, downtown neighbourhoods with many office workers who frequent the parks for lunch. The other parks in the pilot program are located in lower density areas, are not near commuting lines and are mostly visited by families and children. These types of users do not generate the quantities of newspapers, bottles, and cans as do commuters and people on lunch breaks. In addition, increased amounts of paper recycling were reported at park perimeter bins than in interior park bins.¹¹</p>
New South Wales, Australia, 1991	<p>In 1991 the New South Wales Recycling Advisory Unit tested different combinations, colours and configurations of recycling bins located in Sydney's public places. The public places studied included: shopping malls; tourist sites; parks; picnic areas; streets; and, a shopping centre. Results of the study indicated the most effective systems in public places had the following attributes:</p> <ul style="list-style-type: none"> • Conveniently located bins. • Signage on the front, side, tops and overhead clearly identifying the purpose of the bin. • Colour coded bins, with each colour representing a different type of bin. • Providing lids with holes on bins for certain recyclables. • Leave litter bin lids open. • Locate recycling and waste bins side-by-side, as opposed to back-to-back. • Do not have stand alone litter bins.¹²

2.3 Best Practice #3: Design of the Recycling Bins

Bin design is an important aspect to consider when selecting recycling bins. The colour of the bin itself relays the information of what materials would be acceptable. Utilizing the same colours for both curbside collection and in open spaces will provide continuity between collection at home and in open spaces and provide greater recognition of disposal facilities in open spaces.

¹¹ Bureau of Waste Prevention, Reuse and Recycling. 2007. *New York City Public Space Recycling Pilot Program, Report on Results.*

¹² Hyder Consulting. 2007. *Independent Assessment of Public Place Recycling Final Report.*

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Bin design needs to consider whether the recycling program will be single stream or two stream. It is considered good practice to follow the same method as curbside collection, however it may not be feasible depending on the requirements of the processing contractor.

Bin design needs to consider the fact that bins may need to be moved (e.g. in the winter for snow removal), therefore they need to be somewhat portable, but not so portable as to be moved or tipped over by vandals or severe weather. The additional weight of the material may make moving bins difficult. A possible solution to this is to insert a plastic sleeve inside the bin to accommodate removal of materials.

Designing the bins to have different openings for waste and recycling can help avoid confusion as to which items belong in which bin. Bins with larger openings should be used for waste, while recycling bins should be designed with openings to reinforce acceptable material types (round openings for containers, rounded slots for newspapers) and reduce contamination. Rubber rosettes¹³/flanges on the openings may reduce access by vermin but may discourage use of the bins if they become soiled. To avoid this, design bins without flaps, rosettes, or flanges.

The location of the openings is another aspect that needs to be considered. Precipitation may be an issue for bins which have the openings in the top. Rainwater will fill the collection bags if used and 'waterlog' or ruin recyclables, thereby making them difficult to collect and process. Snow may enter the bins and freeze with the contents creating operational issues upon emptying. Both snow and water create extra weight which could become a health and safety concern for collection staff. Locating the opening in the front of the bin solves this problem.

Bins with locking lids or locking side panels may be seen as a deterrent to vandals and "bin raiders", however locks can be cumbersome to collection staff. Having to locate keys, unlock locks, remove the waste, and then relock the bin may be inefficient and time consuming. The use of locks should be considered in discussion with collection staff.

Lastly, the type of material the bin is constructed of and bin size needs to be considered. The size of the container will depend on collection frequency and waste generation. Recycling stream quantities can vary over time (e.g., seasonally) and should be taken into account when determining the appropriate bin size. For instance, bin use in a park setting may increase dramatically in the summer months requiring larger bins and/or more frequent collection. It is recommended that the same sized container is used for each material being collected. It is considered good practice to empty containers when they are half full.

¹³ Rosettes are a circular arrangement of plastic parts radiating out from the center that act like a flap to keep the opening to the bin closed while enabling people to insert material into the container.

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Tri-sorter units made of durable plastic or stainless steel are considered more effective than steel drums, mesh containers, and solid walled units with lids. In-ground Molok units could be considered in areas where collection occurs infrequently.

A recycled plastic bin is an option that illustrates one possible use of recycled materials. Consideration should be given to the possibility of vandalism (e.g. graffiti) and methods to repair the bins. Bins made of thick plastic can be sanded in case of vandalism (e.g. from graffiti) and those of steel can be repainted or cleaned.

Best practices for container design for open space recycling programs include:

- Container colour should reinforce type of material to be collected (i.e. blue container for recycling);
- Container should be composed of durable material heavy enough to stabilize bin during inclement weather or deter vandalism but not so heavy that it can't be moved by operations staff;
- Use different shaped openings for garbage and recycling;
- Shape/size of container openings should reinforce type of material to be collected;
- Use front (not top) openings to limit rain and snow entering container;
- Opening to container should not be blocked by flap, flange or rosette;
- Use curved edged openings to minimize risk of injury;
- Use the same sized container for each material being collected; and,
- Size containers to accommodate fluctuating quantities.

2.3.1 Supporting Case Studies

Location	Case Study Details
New South Wales, Australia, 1991	<p>In 1991 the New South Wales Recycling Advisory Unit tested different combinations, colours and configurations of recycling bins located in Sydney's public places. The public places studied included: shopping malls; tourist sites; parks; picnic areas; streets; and, a shopping centre. Results of the study indicated the most effective systems in public places had the following attributes:</p> <ul style="list-style-type: none"> • Conveniently located bins. • Signage on the front, side, tops and overhead clearly identifying the purpose of the bin. • Colour coded bins, with each colour representing a different type of bin. • Providing lids with holes on bins for certain recyclables. • Leave litter bin lids open. • Locate recycling and waste bins side-by-side, as opposed to

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<p>New South Wales, Australia, 1991 (cont'd)</p>	<p>back-to-back.</p> <ul style="list-style-type: none"> • Do not have stand alone litter bins.¹⁴
<p>New South Wales, Australia, 1999</p>	<p>In 1999, NSW Waste Boards released guidelines for public waste management practices. Research included examining the 1991 NSW Recycling Advisory United recommendations. One research study was conducted at Warringah Mall Shopping Centre using two sets of bins; bins that didn't conform to any of the 1991 recommendations; and those that did. The two sets of bins were audited. Recovery in non-complying bins was 55% compared to 84% in the complying bins. Contamination was 84% in the non-complying bins compared to 21% in the complying bins. The report issued from this research includes recommendations for the ideal recycling station:</p> <ul style="list-style-type: none"> • Side openings on containers • Curved edged openings to minimize risk of injury • Bins made of materials that suit their surroundings durable, and easy to maintain • Two waste bins on either side of a central recycling bin • Co-mingled recycling collection • Different shaped openings for garbage and recycling • Colour coded bins • Standard colour coded signage¹⁵
<p>Quinte West and Belleville, Ontario, Canada, 2005</p>	<p>Quinte Waste Services evaluated some important aspects of bin design during a 2006 study, including the material deposit location, material opening, material collection and bin structure material.</p> <p>Locating the material deposit hole on the top of the bin can be problematic, as the bin will get filled with rainwater during the summer months. A solution to this issue is to drill holes in the bin liner to allow for drainage, but if clear bags are inserted into the bin, each bag must also be punctured or it will fill with water. Locating the material deposit hole on the side of the bin overcomes the rain issue.</p> <p>The opening for depositing materials can be left open or covered with a rubber flange. With an open hole, the individual depositing the materials does not have to make contact with the bin. However, a rubber flange covering the hole prevents vermin, rain and debris from entering the bin.</p> <p>Ease of material collection is an important issue for workers. Bins with locking lids and side doors were seen as unnecessary and time consuming as workers need to remove their gloves, retrieve a key, unlock the bin, remove the materials and relock the bin. Although locks can deter "bin raiders" from collecting recyclables with a value, the time spent by workers unlocking/locking bins suggests it is more of a bother than the value of the recyclables.</p>

¹⁴ Hyder Consulting. 2007. *Independent Assessment of Public Place Recycling Final Report.*

¹⁵ Hyder Consulting. 2007. *Independent Assessment of Public Place Recycling Final Report.*

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<p>Quinte West and Belleville, Ontario, Canada, 2005 (cont'd)</p>	<p>The type of material the bin is constructed of can affect its longevity. Quinte Waste Solutions evaluated two types of materials, recycled plastic and steel. Recycled plastic was found to be stronger than originally anticipated. It is durable, as most vandalism (i.e., paint, markers, etc.) can be sanded off. If the plastic is too thin, it has a tendency to sag in the summer. As garbage bins are commonly metal, plastic recycling bins tend to stand out and are more noticeable. Steel bins are inexpensive to purchase. When steel bins are damaged, they are generally replaced, as it is cheaper to replace them than it is to repair them.¹⁶</p> <p>As part of this study, audits were conducted on different types of waste receptacles to determine which bin design is the most effective for capturing recyclables.</p> <p>With the least amount of cross contamination, the “2-in-1 Signage Bin” featured a swing door located on the front of each bin. Split in half, each bin contained a side for recyclables and a side for waste. A sign was located below the swing door which graphically and textually indicated the purpose of the bin. Aesthetically, the bin was well liked by park users and park managers, however some indicated the design of the bin was better suited for a mall or main street as opposed to a park. The location of the swing door kept rain out of the bin, however the bin also has a side locking door which made emptying the bin more time consuming. A larger bin size is recommended for practicality, but a larger bin would make relocating the bin more difficult.</p>
<p>Melbourne, Australia, Date unknown</p>	<p>Staff at the Melbourne Zoo wanted to reduce the opportunity for birds and vermin to access the recycling bin. They found rosettes were the best design to combat this problem. However, rosettes may not stop all vermin as the Healesville Sanctuary report possums can still enter the bins through the rosettes.¹⁷</p>
<p>Regional Municipality of York, Ontario, Canada, 2008</p>	<p>In the spring of 2008 York Region partnered with the Town of Newmarket to pilot a three stream waste management system along the Tom Taylor Trail and in a neighbouring outdoor recreation complex. The objective of the pilot was to assess level of contamination in new containers, assess effectiveness of messaging, and identify operational challenges and potential solutions of the new system.</p> <p>Background research revealed that park users are particular about not touching the lids of waste receptacles, especially if there is a dirty/sticky flap on the lid. Flat top lids provide a lot of space for messaging and labeling however do not offer as much protection from rain and elements as a side loading lid.</p> <p>There were six different container types tested in the pilot. These included steel drums, mesh containers, solid walled (Earl Bales) units, tri-sorters (both plastic and stainless steel) and Molok units. There were three main variations of lid types which included flat lids, side-loading and flip-up lids.</p>

¹⁶ Quinte Waste Solutions. 2006. *“Recycle Away” Public Park, Sports Field, and Arena Recycling.*

¹⁷ Sustainability Victoria. 2007. *Public Place Recycling Best Practice Guidelines.*

<p>Regional Municipality of York, Ontario, Canada, 2008 (cont'd)</p>	<p>The tri-sorter bins (both plastic and stainless steel) were the preferred containers because all three waste streams are always side by side, the containers were aesthetically pleasing and the side loading lid kept the three streams dry.</p> <p>The stainless steel tri-sorter was also easy to clean if vandalized with spray paint. However the stainless steel container was permanently fixed to the ground, which was inconvenient for operations staff during the winter while trying to remove snow from the park pathway.</p> <p>In-ground Molok Units offer greater capacity and minimal maintenance costs. Their lids keep rain and animals out. The containers are durable. These units would be recommended for locations where collection occurs infrequently.</p> <p>At the end of the summer, staff from the Newmarket Parks Department were asked to participate in a Project Feedback meeting that was aimed at gathering information about the pilot and highlighting areas of improvement for program implementation. Collection staff rated the Tri-sorter units most favourable and the Mesh units least favourable.¹⁸</p>
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2.4 Best Practice #4: Communication with Park Staff, Vendors and Collection Crews

At the outset of the planning process, a list of stakeholders should be developed for consultation including planning staff, park staff, collection crews, processors and vendors.

Park staff and collection crews have first-hand knowledge of critical factors, including appropriate design and locations for recycling bins. Collection staff will be able to offer insight on the type and size of bin most suitable for each location, frequency of collection and other collection considerations. Not allowing input into the design phase of the program may lead to oversights in important program components.

Consultation with recycling processors should occur early in the planning process as well, to determine what materials they will accept.

Although vendors may not be staff members, discussing food packaging options with vendors can lead to more sustainable (i.e. less wasteful) choices. As more choices in packaging and serving containers/utensils become available and economical, many vendors are being asked to use these more sustainable materials to reduce the amount of garbage needing disposal. Vendors may also have important observations as to the habits of their patrons. For example, where the patrons generally consume their food/beverages, the most popular type of

¹⁸ Town of Newmarket and Regional Municipality of York. 2008. *Public Space Three Stream Waste Diversion Parks Pilot.*

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food/beverage ordered, and so on. These observations may impact the placement of recycling bins and the number and type of bins placed in an area.

Effective communication between proponents and stakeholders will help to facilitate initiation of a recycling program in open spaces and can greatly impact the success of an open spaces recycling program. Ongoing communication with stakeholders is equally important once the program has been implemented to address any issues and improve the program.

Best practices for effective communication during open space recycling programs include:

- Develop a stakeholder list;
- Consult with stakeholders early in planning process; and,
- Consult with stakeholders throughout implementation of the program.

2.4.1 Supporting Case Studies

Location	Case Study Details
State of Victoria, Australia, Date unknown	<p>A 12-month recycling pilot program was initiated at 4 alpine resorts in Victoria. The resorts were having litter issues, due to patrons improperly disposing of cigarette butts, and food and drink containers. Colour-coded bins were installed side-by side. Each bin had signage clearly indicating the bins intended use. The project also contained a significant education and training component. Promotional materials included posters depicting the recycling bins; drink coasters reminded people to properly dispose of their litter; media releases announced the installation of recycling bins; and fifteen billboards and a website advertised the recycling bins. The training component of the program included informing maintenance staff of bin pick-up and monitoring; educating visitors regarding the problems associated with litter; and, weekly education sessions.</p> <p>Positive results arising from the program included:</p> <ul style="list-style-type: none"> • The low contamination rates and successful solutions to identified issues, resulted in recycling contractors having no issues with the program. • One of the alpine resorts received international certification from Green Globe, identifying them as part of ecologically and socially sustainable tourism. • Maintenance staff at one resort fully endorsed the program and wanted to see additional installation of bins in more locations. • Restaurants at another resort initiated their own recycling program.¹⁹
New York City, United States, 2007	<p>A 2007 New York City pilot program placing recycling bins in several ferry terminals and parks resulted in some key findings regarding maintenance of the bins. A dedicated, permanent and trained staff is required for collection. They must be diligent in monitoring the recycling bins to ensure</p>

¹⁹ Sustainability Victoria. 2007. *Public Place Recycling Best Practice Guidelines*.

Location	Case Study Details
New York City, United States, 2007 (cont'd)	they are emptied before they overflow and that all collections are placed in the designated area for pick-up by the collection vehicle. The staff must be aware of the need to keep paper and other recyclables separate. ²⁰

3 MONITORING AND ANALYSIS

Monitoring the performance of the recycling initiatives should be completed prior to and post implementation. It is recommended that a detailed waste audit be conducted prior to program implementation to establish a baseline of waste composition and completed again after the program is running (for example within a few months of operation). Waste audits provide a detailed quantitative breakdown of waste composition and provide waste diversion and contamination rates. Diversion and contamination rates can be compared for pre- and post-implementation of a program measuring the impact of the recycling program.

Ongoing monitoring should be conducted throughout the implementation of a recycling program. Simplified waste audits can be completed, for example on a monthly basis, documenting acceptable versus non-acceptable materials only. Other monitoring programs could include the visual inspection of recycling and garbage bins to qualitatively assess level of and type of contamination, requesting that collection service providers weigh recycling and garbage collected at open spaces, observation of open space users, public surveys and communication with park staff and collection crews.

Best practices for effective monitoring of open space recycling programs include:

- Conduct a waste audit prior to implementation to establish a baseline;
- Conduct a waste audit post-implementation and on a regular basis;
- Observation of users of open space recycling containers; and,
- Ongoing communication with stakeholders.

²⁰ Bureau of Waste Prevention, Reuse and Recycling. 2007. *New York City Public Space Recycling Pilot Program, Report on Results.*

4 RECOMMENDATION FOR FURTHER ANALYSIS

The direct impact of pairing recycling bins with garbage bins, signage, and colour coding containers along with appropriate signage has been assessed. Additional study is recommended to confirm best practices for:

- The impact of the following recycling initiatives on waste composition, diversion and contamination needs to be assessed:
 - Single stream versus two stream bin design;
 - Location of recycling bins throughout an open space;
 - Number of recycling bins needed throughout an open space;
 - Size and shape of recycling bins;
 - Location of openings and style of openings;
 - Spacing of recycling bins throughout open spaces;
 - Methods of communication with staff, vendors, collection crews, and processors; and,
 - Methods of communication with the public.
- Cost/benefit analysis of implementing different recycling programs, containers, etc. should be conducted to assess the cost implications associated with implementing potential best practices.

5 CLOSURE

If you have any questions or would like further clarification on our results, please contact me directly at 905-631-3923 or by email at Kerrie.Skillen@Stantec.com at your earliest convenience.

Respectfully Submitted,

STANTEC CONSULTING LIMITED

Original signed by

Kerrie Skillen
Team Leader and Project Manager, Ontario Solid Waste Services
Tel: (905) 631-3923
Fax: (905) 631-8960
kerrie.skillen@stantec.com

c. Jim McKay, Stantec Consulting Limited

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