Aspects of Solid Waste Management in Edmonds, Washington

Project Reports
Campus Sustainability Planning Studio
ENVS 471, Fall 2016

Report No. 16-01 December 2016

WESTERN
WASHINGTON UNIVERSITY

Sustainable
Communities
Partnership

About SCP

Sustainable Communities Partnership

Western's SCP program focuses the energy and ideas of faculty and students upon the issues that cities face as our society transitions to a more sustainable future. SCP partners with one community each academic year, facilitating a program in which many Western courses complete service-learning projects that address problems identified by the partner.

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SCP Partner for Academic Year 2016 - 2017: The City of Edmonds, WA

SCP is proud to partner with the City of Edmonds, Washington, during the program's inaugural year. Eleven courses at Western will tackle ten projects identified in collaboration with city staff.

Acknowledgment

The Association of Washington Cities (AWC) has provided invaluable assistance during the launch of the SCP program. AWC provided seed funding, guidance regarding program design, help with promotion of the program, and advice regarding selection of the inaugural partner.

SCP is housed within Western's Office of Sustainability

PREFACE

The fall 2016 Campus Sustainability Planning Studio course (ENVS 471) worked on issues related to solid waste management in Edmonds. Three separate topics were identified, in collaboration between the instructor and the city's recycling coordinator. Each topic was tackled by a separate student team. This document contains the three reports generated by the student teams. Students visited Edmonds on December 1, 2016, and presented their results to an audience of officials and interested citizens.

Instructor: Seth Vidaña

Edmonds Recycling Coordinator: Steve Fisher

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In partnership with:

ZERO FOOD WASTE: ACTION FOR EDMONDS

Campus Sustainability Planning Studio

ENVS 471, Fall Quarter 2016

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Clara Vannice

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Executive Summary

The City of Edmonds has adopted a long-term Zero Waste goal. As a preliminary step toward this goal, Edmonds has chosen to focus on the issue of food waste at public events. We propose implementation of a Zero Waste Agreement and creation of public-education tools, to encourage proper disposal of food waste at public events and to help Edmonds achieve its Zero Waste goal.

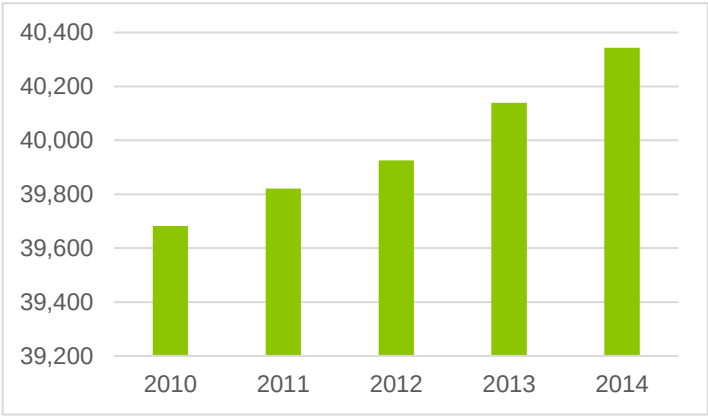
Introduction

Waste is an expanding global problem caused by a growing population and increasing consumption. In 2016, in a world with 7.5 billion people, we collectively generate 7 to 10 billion tons of waste each year. By the end of the century, global population is predicted to rise to 11 billion people. This means more waste generation in the future, absent a change in current practices.

The U.S. is not exempt from this problem. Our national economy is based on extracting resources, manufacturing and distributing products, using and discarding products into landfills, or worse yet, into the oceans. This system encourages excessive waste and does not take into account the full environmental and social costs of these actions. The result is increasing depletion of natural resources, increasing greenhouse gas emissions, and deteriorating air and water quality—all of which are environmentally unsustainable and costly to society.

The amount of waste generated per person per day in Edmonds, coupled with the city's growing population (illustrated in Graph 1), puts pressure on our already strained regional waste management system. For the U.S. as a whole, average per capita waste generation is about 4.38 pounds per day. In 2009, each person in Snohomish County generated 3.53 pounds per day. The Edmonds community can help solve these problems through a variety of regional and local actions that aim to reduce waste and increase recycled material, which can be recovered for reuse and compost.

Graph 1. Total Population in Edmonds 2010-2014



Source: U.S. Census Bureau, American Community Survey

Statement of Need

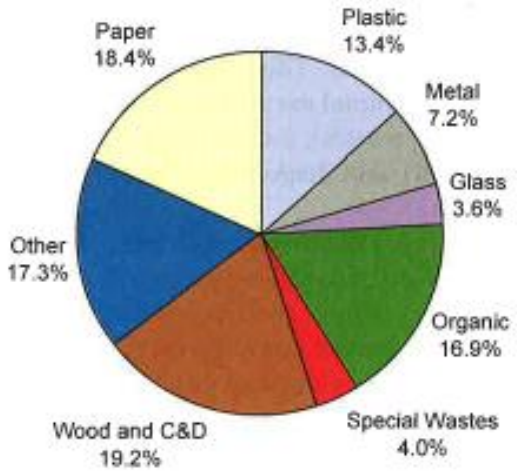
> *Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. … Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.* (Zero Waste International Alliance)

In April 2016, Edmonds City Council adopted Zero Waste and Beyond Waste as long-term goals to prevent and eliminate waste and pollution in the extraction, manufacture, transportation, storage, use, reuse, and recycling of materials.

To achieve this goal, the city first needs to identify quantitative metrics and establish dependable baseline measurements. The most recent data we can use as a baseline is from 2009, when a waste composition study was performed in Snohomish County. The study used transfer-station records and information provided by garbage haulers to determine the amount of waste generated by different sources. Waste-composition data was gathered by sorting and classifying randomly selected samples of waste at the county's transfer stations. Waste was classified into five waste-generator categories. The study found that residential sources in Snohomish County generated more waste (57.7 percent) than non-residential sources (42.3 percent). The total amount in 2009 was 460,700 tons of waste. Waste composition results are shown in Graph 2. One recommendation of this study is that food waste diversion should be considered, because food was the single largest recyclable item found in the waste stream, and food waste can be transformed into compost.

The study also showed that Edmonds needs strategies that significantly reduce waste. A strategy to achieve Zero Waste includes encouraging residents, businesses, and agencies to use, reuse, and recycle materials judiciously. Additionally, manufacturers must be encouraged to produce less toxic products and instead create durable, repairable, recycled, and recyclable products. The strategy Edmonds seeks to pursue is to introduce an organic waste reduction program, focusing initially on public events at city facilities. The primary value of the program is public education, rather than the actual diversion of waste. In public venues, it's possible to introduce citizens to the idea that food waste is not waste; food waste has value if it is transformed into compost. Public education is a crucial step for Edmonds to successfully achieve the Zero Waste and Beyond Waste goals.

Graph 2. Composition of Snohomish County Waste[1]



Project Description

An organic waste reduction program at public events in Edmonds needs to consider every type of stakeholder. For this reason, we propose the use of a waste-management plan approach, which is a simple and effective way to minimize waste generation at an event. The approach incorporates various stages in order to achieve effective waste management, including planning, doing, checking, and taking corrective action, when and where necessary. (Zero Waste South Australia[2])

These are the goals for each event in Edmonds:

Goal 1: Reduce the amount of waste generated at Zero Waste public events.

Goal 2: Increase the amount of waste recycled and composted at Zero Waste public events.

Zero Waste Agreement

For waste to be reduced at events and venues, all associated key individuals and groups need to set goals and develop actions for waste minimization. The Zero Waste Agreement is a document that should be added to the Event Organizer Contract, which should be drafted and rolled out in 2017. The goal of this document is to clearly outline the responsibilities of the event organizers and to create a standard of operations at public events regarding recycling and compost diversion and disposal.

The document is broken into different sections. The first section talks about the roles and responsibilities of the main stakeholders, as outlined in the table below.

Who	Responsibilities (Proposed)
Event organizer (i.e., Chamber of Commerce)	• Provide the on-site and final collection of compostable and recyclable materials, using designated and color-coded containers. All collection containers will feature specific signage. • Ensure that on-site containers are serviced properly and continually during the event. • Ensure that food vendors provide compostable products at the event.
Commercial Food and Beverage Vendors	• Provide compostable and recyclable food ware items during the event.
Edmonds City Recycling Program	• Provide a detailed list of the acceptable food ware items, and a list of local suppliers for the compostable items. • Optional: Provide volunteers for on-site education during the event to help patrons use the three-container system (compost, recycle, and garbage). • Optional: Provide additional designated containers to use during the event.

The document also includes an "accepted and unaccepted materials list," which clarifies to event organizers and food vendors which items can be used at public events and which items cannot be used. In collaboration with Edmonds' recycling coordinator, this list was created based on the types of materials commercially accepted for composting at Cedar Grove compost site.

The agreement explains the infrastructure and educational materials available to event organizers, should they desire to use them. The event organizer is required to have a sufficient number of recycle and compost bins at the event. They may choose to use their own bins or they can request the use of the city's bins. Additionally, event organizers must provide a prominent space for a Zero Waste booth at each event. Event organizers can also choose to make use of the city's educational materials for themselves and their vendors upon request.

Event organizers must specify whether they plan to use the city's bins and education materials, and must sign an agreement form in which they agree to adhere to the guidelines of the Zero Waste Agreement. The proposed document can be found in Annex 2.

Education

As previously stated, the primary value of the program focuses on the educational aspects, rather than the actual potential for waste diversion. Providing infrastructure (bins and signage) is necessary to create a Zero Waste event; it helps people segregate recyclable and compostable items. But infrastructure does not truly educate people and generate change. To create environmental awareness and teach people why Zero Waste is important, we propose three strategies to communicate with and educate people in an effective way:

- Zero-waste volunteers
- Informational brochures
- Zero-waste booth

Zero Waste Volunteers

Volunteers at Zero Waste events are a key ingredient of success. We propose two categories of volunteers: Eco Representatives (Eco Rep) and Eco Volunteers. Being an Eco Rep is a long-term commitment. Eco Reps oversee, as well as run, the Zero Waste booth. An Eco Volunteer is a short-term worker who staffs the Zero Waste station, helping citizens sort waste into the correct bin. The following tables describe aspects of responsibilities, recruitment, and training.

Responsibilities of Volunteers

Who	Responsibilities

Eco Reps	• A group of reliable volunteers that are "pros" (Two to three Eco Reps per event)
	• Eco Reps are responsible for operating the Zero Waste interactive booth at each event
	  ○ Running interactive games
	  ○ Handing out prizes
	  ○ Answering the public's questions regarding Zero Waste at the event and at home
	• Eco Reps are a resource for the Eco Volunteers throughout the event

Eco Volunteers	• Manage the Zero Waste stations (should have at least one person per station) • Are responsible for getting trained prior to the event (must show up early to event for training)

Training volunteers

	Eco Reps	Eco Volunteers
Who provides the training:	The city recycling coordinator.	The Eco Reps.
When to train:	Prior to the start of the volunteer position.	30 minutes prior to regular arrival time to be trained on their responsibilities for the day.
Duration of commitment:	Long-term volunteer position.	At least one event.

Gathering Volunteers

Eco Reps	Eco Volunteers

• Past volunteers who know the material well already.
• University students looking for an internship.
  ○ WSU Extension, Edmonds Community College Green Team
• Dedicated community members looking for a long-term volunteer position.
	• High school classes that require students to have a certain number of service hours per year (Science courses, ASB classes, students looking to build their resumes).
	  ○ Make contact with high schools in Edmonds through contacting department heads, principal, ASB advisors, career center adviser.
	• Willing community members (sought out through Facebook advertising, newsletters, targeted email lists, city website, and word of mouth).

Informational Brochure

> *Promotion can largely affect the success of waste minimization measures implemented. If people don't know what you are trying to achieve and why, they won't change their behavior. If they don't understand the different bin systems in place, how can they use them correctly?* (Zero Waste South Australia[2])

To communicate with the vendors and the public in an effective way, we propose at least two different brochures:

Food Vendor Brochure

Food vendors are being required to change their purchasing behavior, from cheap disposable supplies to compostable service ware. They need to know what products are available to purchase that are acceptable for composting, as well as why this is important. A brochure draft can be found in Annex 3.

Public Brochure

An informational brochure can also be created specifically for the public. These can be given out at the Zero Waste booth. The brochure includes information coaches the public to be sustainable consumers at public events and in their own homes. Information in the public brochure will include answers to questions such as:

- What is Zero Waste?
- Why Zero Waste?
- What is a compostable item?
- Where is your waste going?
- What can you do?

Zero Waste Booth

The Zero Waste booths are the space where we put all the previous actions to work. It is mandatory to have a Zero Waste booth at each event to provide information to the public about composting at events and at home. The Zero Waste booth is an important tool in diverting waste from the landfill and educating the public. There will be three different sources of information.

- Eco Reps. These volunteers are the experts in the field of waste management and sustainability. People who want to know more about sustainable waste management than the information provided by the volunteers at the Zero Waste stations will be able to talk to the Eco Reps at the Zero Waste booth. The Eco Reps will be able to answer questions about composting and recycling, as well as give information about what is compostable, why it is important, where their waste ends up, what the Zero Waste goal is for Edmonds, etc.
- Brochure**.** If interested, the public can take home the information given by the Eco Reps in the form of a brochure, similar to the one given to the vendors. It will be information that is more specific to the public and how they can be sustainable consumers in their own home. It can explain what the Zero Waste goal is for public events and how that can affect the community at home.
- Posters or Flyers. Information will also be given in the form of flyers or small posters that the public can use at home. The Food Waste Flyer (located in Annex 4) is an example of an

educational tool that can be used at home to explain how to properly dispose of waste in a sustainable manner. The Seven Generations Ahead website has a good example of a Zero Waste booth and the type of information that should be given. There can be different flyers for children, single family homes, multifamily homes, and single people, who all produce different quantities of waste. Provided in Annex 5 is a portion of the Seven Generations Ahead "Zero Waste Event Planning Guide." This type of information is important not only for the vendors, but for the public as well. It gives them an idea of Edmonds' goal for public events. It also informs them of different ways to reach the Zero Waste goal.

What draws people to the booth?

Besides those who have questions about waste management, we will attract people to the Zero Waste booths by providing prizes, gifts, and games. It is important to have the prizes follow the model of Zero Waste and be sustainable—things such as reusable water bottles and totes, recyclable posters and coloring books for kids, tumblers, compostable bags, etc. If there are gift bags, let people choose what they want in the bag so they don't throw unwanted prizes away at home.

Games with prizes are a very good way of drawing people in. Trivia, compost corn hole, fruit sticker bingo, and other games that educate the public are helpful in making sustainable waste management fun, as well as making sure that information is retained.

Annex 6 shows a fruit sticker trading card implemented by Waste Management in 2015. They offered a free bag of compost with every full fruit sticker card. Although this program is no longer in effect, it is a good method for people to habitually keep non-compostable stickers out of organic waste bins. These are examples of games and activities that could be given out at Zero Waste booths.

Visuals are also important when talking to the public. Having a backyard compost bin at the Zero Waste booth is a good way to show the public how to compost in their own homes, and what is and is not compostable. Figure 1 is an example that shows what goes inside a composting bin.

Figure 1 Example of compost bin (cutaway to show contents)

The overall goal for the Zero Waste booth is to educate the public on proper composting and recycling not only at public events, but in their homes as well. It gives people a chance to get involved in the community by working with and educating others, and to learn about waste management in a new and more personable way. Educating the community about waste management is important because it creates a greater consciousness about sustainability within Edmonds.

Measuring Success

> *Reporting and evaluating your waste minimization actions and the success of your waste management actions is vital for continued success. Unfortunately, it is one of the last steps, and so often does not have enough time, effort or emphasis allocated to it. If information is only anecdotal and not clearly recorded, how will you really know what you have achieved?* (Zero Waste South Australia)

To evaluate, we propose two types of measures:

- Quantitative
- Qualitative

The quantitative measure requires that someone track waste generation and disposal. Waste haulers are the stakeholders who can weigh the different sources of waste. This will not be required at the beginning of the program in 2017, but is an improvement to be adopted in the near term. The indicators that should be required (measured in pounds or kilograms) are:

- Total waste material generated at event
- Material recycled
- Material composted
- Total material diverted from landfill
- Diversion rate percentage

Qualitative measures should respond to at least the following questions: Has the event or venue achieved its goals? How effective were the educational strategies (how many people came to the booth, what was the popularity of the brochures and other take home tools)? Were there unanticipated beneficial outcomes? How did these come about? Document all the achievements for reporting, evaluation, and continual improvement.

Waste Analysis Method

The National League of Cities Sustainable Cities Institute has developed an effective way to measure the various categories of waste in the waste stream. This method could prove effective for Edmonds to measure the various components of event-generated waste. A waste analysis of this type provides a baseline for long-term analysis of diversion rates at public events and for the city as a whole.

For a detailed description of this waste analysis method visit:

http://www.sustainablecitiesinstitute.org/topics/materials-management/conducting-a-waste-characterization-study-overview

Case Studies

To design our proposals, we used the case-study methodology.

Case Study 1: CenturyLink Field

Actions

- In 2010, they moved to **all-compostable service ware**. 100 percent of food containers are compostable and all plastic bottles are recyclable.
- They gave fans **only two disposal options**: either recyclable (plastic, aluminum) or compostable.
- In 2012, FGI implemented a **single-stream recycling strategy** to further their goal of achieving an 80 percent landfill diversion rate.

Results

- 614 recycle and compost bins are located throughout CenturyLink Field.
- Last year (2015), **96 percent of waste generated was diverted from landfills.**

Learnings

- "We found that if you give fans the option of landfill bins, they usually choose landfill because it's familiar, even when the signs say compost," said Darryl Benge, assistant general manager at First & Goal Inc., operator of CenturyLink Field.

Full case study at: https://www.nrdc.org/sites/default/files/CenturyLink-Case-Study.pdf

Case Study 2: Waste Management Phoenix Open

Actions

- In 2012, Waste Management launched the **Zero Waste Challenge** to encourage the reuse of materials, and to reduce the amount of waste sent to the landfill from the Phoenix Open.
- Participating businesses were required to fill out a **Zero Waste Agreement** which listed the material streams collected at the event and provided businesses with a list of products that would be accepted in the waste streams at the event.
- **Color coded waste stations** were distributed throughout the event.

Results

- **100 percent of waste and materials were diverted from the landfill** or reused for the following year's event.

Full case study at: https://www.uszwbc.org/wp-content/uploads/2016/01/Lee-Spivak-7-Days-568008-Fans-0-Waste.pdf

Case Study 3: Seven Generations Ahead in Schools

Actions

- **Partnership:** Seven Generations Ahead and Chicago Public Schools conducted a five-school commercial composting pilot program called "CPS Composts: Don't Throw Me Away!"
- **Operational changes were paired with student and teacher training** to make curriculum connections. From Earth Day assemblies to all-school sorting relay races, from classroom presentations to creative dumpster sign making, from hands-on teacher training to lunchroom waste assessments.

Results

- **More than 2,400 students** from these five pilot schools learned about and participated in recycling and composting efforts.
- Zero Waste Ambassadors learned how to make good environmental choices, recover resources, and help teach others about reducing waste.

Learnings

- **Measuring the potential:** These five schools alone, during one school year, have the potential to keep 17,000 pounds of resources out of landfills, and potentially recycle 400,000 milk cartons.

Full case study at: http://sevengenerationsahead.org/zero-waste-stories-from-the-field/cps-zero-waste-ambassadors-make-a-big-difference

Case Study 4: Green Block Parties—River Forest District & PlanItGreen

Actions

- The Chicago River Forest Park District adopted a Zero Waste goal, but the public found it difficult to adapt. The PlanItGreen Core Team decided to take it one step at a time and start by making local block parties green. If the host chooses to have a Zero Waste block party, they are provided a "Green Block Party Kit." This kit provides a series of documents that inform the hosts on Zero Waste and the planning process behind having a Zero Waste event.

Results

- Half of the block parties held each year have been "green" block parties.

Learnings

- Education is the biggest tool in having a Zero Waste goal. By providing education to the public, they were able to fully understand Zero Waste, which gave them incentive to work for a Zero Waste goal. Through education, more residents are willing to be sustainable community members.

Full case study at: http://www.river-forest.us/residents/block-party-permits

Conclusions

We propose that Edmonds implement a Zero Waste Agreement and create educational tools to generate more participation in proper disposal of food waste at public events.

We believe the Zero Waste Agreement will help Edmonds achieve their Zero Waste and Beyond Waste goals. We also believe that Zero Waste events are easily possible in the near future. We feel hopeful that the event organizers of one of Edmonds' largest public events, Taste of Edmonds, believes these changes are attainable for their vendors. Requiring the use of compostable products is becoming increasingly more common and is no longer considered a hindrance to the majority of vendors.

Furthermore, the underlying goal of this project is to encourage the public to practice Zero Waste measures in their own homes. Zero Waste education at public events may help inform and inspire the public to take part in the city's long-term Zero Waste and Beyond Waste goals. This two-part solution for Edmonds will tackle the specific obstacles currently hindering the city's progress toward Zero Waste and Beyond Waste goals.

References

1. "Snohomish County Waste Composition Study," Snohomish County Solid Waste Division. (2009). Retrievable at: http://www.green-solutions.biz/snohocowastecomp2009final.pdf
2. "Waste Minimization Guide: Events and Venues," Government of South Australia, Zero Waste SA. Retrievable at: http://www.zerowaste.sa.gov.au/upload/event-guidelines/Waste%20minimisation%20guide%20for%20events%20and%20venues_2.pdf
3. "Waste Resources Plan," City of Olympia, WA. Retrievable at: http://www.codepublishing.com/WA/Olympia/?wr/OlympiaWRNT.html

Annexes

Annex 1: Edmonds Resolution 1357, Zero Waste and Beyond Waste

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RESOLUTION NO. 1357

WHEREAS, the State of Washington's Waste Not Washington Act ESHB 1671 of 1989, is a comprehensive solid waste management bill that establishes the fundamental strategies of waste reduction and source separation of solid wastes; and

WHEREAS, the Waste Not Washington Act also established an aggressive state goal to achieve a fifty percent recycling rate by 1995, which included the efforts of local governments to help achieve this goal by including waste reduction and recycling elements in their own comprehensive solid waste management plans; and

WHEREAS, the Washington Department of Ecology issued in 2004 a state solid and hazardous waste plan titled "Beyond Waste Plan" as required under Chapter 70.95 and Chapter 70.105, Revised Code of Washington [RCW] to be developed and regularly updated (updated in 2009 and 2015), which is a 30 year plan for eliminating wastes and the use of toxic substances; and

WHEREAS, the Beyond Waste Plan is the state plan to support the waste management hierarchy established in the main solid and hazardous waste statutes which both identify waste reduction as the highest priority. The 30-year vision outlined in the Beyond Waste Plan seeks to eliminate most solid wastes and toxics and use any remaining waste products as resources; and

WHEREAS, the Beyond Waste Plan uses a sustainable materials management approach that looks at the full life cycle of materials from the design and manufacturing phase, through the use phase and to the end-of-life phase when the material is either disposed of or recycled, which is an approach also used by the U.S. Environmental Protection Agency; and

WHEREAS, the Snohomish County 2013 Comprehensive Solid Waste Management Plan embraces the State strategies and goals, including the Beyond Waste Plan, and has a vision that shifts to a more sustainable future, where people are generating less waste and handling wastes they do generate using environmentally sound and approaches; and

WHEREAS, the Snohomish County 2013 Comprehensive Solid Waste Management Plan includes waste prevention, reduction of waste and toxic materials pollution prevention, reuse, recycling, and equitable and efficient waste collection services for County residences and businesses, and supports product stewardship that acknowledges that not all products and packaging are suitable for reuse or recycling and that some products require special handling for disposal such as pharmaceuticals, pesticides and other hazardous

1

waste; and acknowledges that the reduction of waste and toxics, pollution prevention and reuse, make up the highest tier of the solid waste hierarchy; and

WHEREAS, the City of Edmonds is a signatory on the interlocal agreement to follow the County's Comprehensive Solid Waste Management Plan and indeed continually carries out waste reduction and recycling actions and activities as outlined in the Plan; and

WHEREAS, Zero Waste is a philosophy and visionary goal that supports the Beyond Waste Plan and is ethical, economical, and efficient and will guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use; and

WHEREAS, Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not dispose of them; and

WHEREAS, implementing Zero Waste strives to eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health; and

WHEREAS, Edmonds 2015 Comprehensive Plan identifies Zero Waste as a strategic goal for consideration.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Edmonds hereby adopts both Zero Waste and Beyond Waste as long-term goals in order to prevent and eliminate waste and pollution in the extraction, manufacture, transportation, storage, use, reuse, and recycling of materials. These goals can be achieved through action plans and strategies that significantly prevent and reduce waste and pollution.

These strategies will include 1) encouraging residents, businesses and agencies to use, reuse, and recycle materials judiciously, in addition to encouraging manufacturers to produce and market less toxic and more durable, repairable, recycled, and recyclable products; 2) investigating mandatory waste collection in support of the Snohomish County Comprehensive Solid Waste Management Plan; and 3) investigating construction and demolition waste source separation strategies such as permit incentives, mandatory source separation and recycling, education and outreach.

In order to establish short- and long-term goals, and monitor city efforts, City staff will first identify quantitative metrics and establish dependable baseline measurements. Staff may collaborate with the Climate Protection Committee to assist in program evaluation. Data measures should mirror State and County measures when possible, and should include reasonably attainable local per capita rates, and other pertinent data. Quantitative

targets should strive to meet or exceed State and County targets and be updated accordingly.

RESOLVED this 19th day of April, 2016.

CITY OF EDMONDS

MAYOR, DAVE EARLING

ATTEST:

CITY CLERK, SCOTT PASSEY

FILED WITH THE CITY CLERK: April 15, 2016
PASSED BY THE CITY COUNCIL: April 19, 2016
RESOLUTION NO. 1357

Annex 2: Zero Waste Agreement

What Does Zero Waste Mean in Edmonds?

In April 2016, Edmonds City Council adopted Zero Waste and Beyond Waste as long-term goals for the city. Targeting the disposal of food waste at public events as well as educating the public on such topics are crucial steps for Edmonds to successfully achieve its Zero Waste and Beyond Waste goals.

Material Streams Collected at Public Events in Edmonds

Accepted Recyclable Items	**Accepted Compostable Items**[1]	**Unaccepted Items**
• Plastic bottles • Aluminum cans • Clear plastic cold cups (PET)	• Uncoated paper plates, bowls, and boats[2] • Napkins and paper towels • Paper portion cups • Paper food wraps and basket liners • Compostable hot cups • Compostable utensils • Compostable straws (PLA 7 or paper)	• Shiny-coated plates, etc. (Dixie, Hefty) • Styrofoam plates and cups • Plastic portion cups and lids • Plastic wrap and bags • Foil wraps • Candy wrappers

[1] Costco and Cash N Carry, along with other food service suppliers, have several brands of compostable items, such as Chinet, World Centric, and Pactiv.

[2] Uncoated paper plates are very common. Also look for paper products that state "clay-coated" or "PLA-lined," which are usually acceptable as compostable products.

Guidelines for Acceptable Materials

All materials must meet the standards of the Cedar Grove compost facilitiy. Accepted materials have been tested by Cedar Grove and have been proven to be commercially compostable. A list of acceptable brands is available at this link: http://cedar-grove.com/compostable/accepted-items

All recycle materials must meet the standards of hauling services in Edmonds (Sound Disposal, Republic Services, and Waste Management NW). A list of acceptable materials and an informational flyer are available at this link: http://www.edmondswa.gov/pw-garbage-recycling-faq-menu-recycling-pickup-accepted.html

Infrastructure and Educational Materials

Clear Stream recycle and compost bins are available to event organizers through the city of Edmonds. The event organizer is responsible for having a sufficient number of bins available at each event. Zero Waste educational materials are also available at your request. These materials include informational brochures for your selected food vendors as well as information for you, the event organizer. Please indicate below if you are interested in using the city's supply of bins and educational materials for your event.

Zero Waste Participation Agreement (Template)

As an event organizer of a public event in the City of Edmonds, I have read the Acceptable Materials Guidelines and will communicate these requirements to all food vendors participating in the event. I will also use the educational materials and assistance supplied to us by the City of Edmonds waste prevention and recycling program to make our event a Zero Waste event.

☥ Yes, we would like to use the city's supply of compost and recycling bins at our event

☥ Yes, we would like to use the city's Zero Waste educational materials at our event

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Title of Event

Event Organizer (Print Name)

Signature Date

Please sign and return this form to the City of Edmonds recycling coordinator 60 days prior to the event date.

Annex 3: Informational Brochure for Vendors

ZERO WASTE
EDMONDS

We want to eliminate all discharges to:

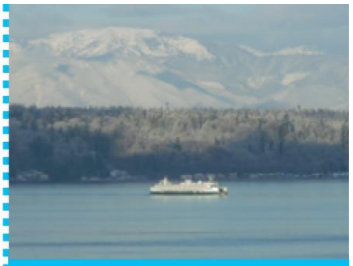
Water Landfill Air

For public events, we aim to have bins just for:

Recyclables Compostables

Now each event has a **diversion rate goal**. Get more information with your event organizer.

We believe in people; we believe in you. If you change, everything changes.



Compostable Food Serviceware

Things you need to know before purchasing.

CITY OF EDMONDS Inc. 1890

Before purchasing, check first if the product is really COMPOSTABLE!

Bio-based plastics are made from:

Corn Starch

Others

Not all bio-based plastics are biodegradable or compostable

In fact, many bio-based products are designed to behave like traditional petroleum-based plastic, and remain structurally intact for hundreds of years.

USDA CERTIFIED BIOBASED PRODUCT PRODUCT 100%

This certification is not enough to prove the products are compostable.

Biodegradable vs. Compostable

- The term "biodegradable" must be qualified by the environment and timeframe.
- Composting is one environment where biodegradation occurs.

BPI ® COMPOSTABLE IN INDUSTRIAL FACILITIES

Check locally, as these do not exist in many communities. **Not suitable for backyard composting.** CERT # 678320

Look for this type of certifications!

Composting business

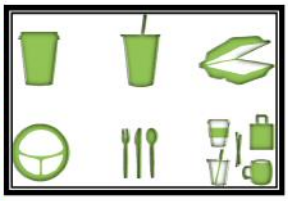
Cedar Grove supports the evolving use of compostable and recyclable products that replace materials that would otherwise end up in a landfill.

CEDAR GROVE

They accept certain items for composting. Check the list at: http://cedar-grove.com/compostable/accepted-items

Products Available

- Bags
- Bowls
- Clamshells
- Coffee Sleeves
- Cold Cups
- Utensiles
- Drink Carriers
- Food trays
- Hot Cups
- Napkins
- Plates
- Straws
- Etc.



"... compostable food service products stand up to perform just as well as their disposable counterparts". (Eco-cycle)

Annex 4: Food Waste Flyer

Annex 5: Seven Generations Ahead Planning Guide

Why Zero Waste?

- Nearly half of all U.S. landfills are full or have been closed because of groundwater contamination.
- Establishing new landfills as a long-term strategy is not sustainable due to pollution (methane emissions, other greenhouse gas leaks, groundwater pollution, etc.), high landfill siting and maintenance costs, inadequate landfill closing accountability, and lack of interest among residents to live near sites.
- To achieve a sustainable system of managing our resources, communities must incorporate nature's law, **waste = food**, and channel materials into reuse and new production.
- The linear model of consumerism (extracting virgin resources for products and packaging, then discarding these resources to landfills or incinerators) is a primary cause of global resource depletion and associated environmental, climate, and social problems.

Key Components of Zero Waste

- Source reduction: Eliminates waste at its source. This includes choosing products that come with little or no packaging, such as beer kegs instead of bottles, or other types of bulk items. Source reduction also eliminates unnecessary items like frilly toothpicks, paper doilies, and inedible garnishes. Product stewardship is an important part of source reduction and emphasizes selecting materials with their best end use in mind (i.e. if materials cannot be reused, recycled, or composted, then these materials should not be purchased or used).

- Recycling: Processes used materials into new products to divert waste from the landfill. Recycling helps to conserve natural resources, reduce air and water pollution, generate less solid waste, and reduce the year-to-year costs of extracting and manufacturing new products.

- Composting: Turns organics such as food scraps, yard waste, and paper back into soil that can be used to grow new plants and crops. Organics account for a *significant* component of solid waste. Furthermore, the mixing of organics with traditional waste at landfills generates an immediate combustion of methane, a greenhouse gas that is 110 times more potent in the near term (over a 20-year period) than carbon dioxide, making food residual diversion an important global warming mitigation strategy.

- Liquid diversion: Diverts liquid from the landfill by collecting it beforehand. This helps to prevent groundwater contamination by chemical leachates and also keeps pests out of dumpsters.

Common Terms

- ~~Garbage~~Landfill: Replace the word garbage with landfill. Garbage implies a mix of everything hidden in a large black can. Zero waste asks you to think of what is in that can that should/could be somewhere else.

- Upstream/Downstream:
  - Upstream: Preventing waste creation at its source (the best scenario).
  - Downstream: Once waste has been created, handling it in an environmentally responsible way by re-channeling materials into reuse and new production.

Annex 6: Sticker Bingo

REDUCING CONTAMINATION IN A SINGLE-BIN RECYCLING COLLECTION SYSTEM

Mallory Cooke, Monica Hescheles, Solvei Metcalf

Executive Summary

Contamination in single-bin commingled recycling systems is an issue of significant concern. Unlike contamination seen in multi-bin curbside recycling, which is primarily caused by improper recycling practices, contamination in a single-bin collection system can occur even if all materials are recycled "properly." I.e., within the single bin, one properly recycled item can contaminate another such item, meaning that someone can follow instructions with perfect accuracy and still potentially affect parts of the recycling process in a negative way. Glass bottles and jars, for example, are accepted in the single-bin curbside system, yet pose one of the biggest threats to material recovery when collected this way.

When done right, recycling is an effective way for a community to simultaneously reduce their energy consumption, decrease spending on raw materials, and support the local economy. With that in mind, it is important that all measures are taken to allow a community to recycle to their fullest potential. Studies have indicated that there are ways to greatly reduce contamination, as well as many of the harmful effects and inefficiencies that come with it. Our goal is to explain how the use of alternative disposal methods for some of the larger contributors to the issue, such as glass, plastic bags, and plastic film, achieve material recovery more effectively than methods currently in place. A second goal is to explain how public education can powerfully supplement a transition to more accurate and effective recycling practices.

Statement of Need

Contamination in a commingled single-bin recycling system caused by plastic bags, plastic film, and glass bottles and jars, reduces the amount of material that can be recovered, lowers the value of marketable recyclables, and causes additional inefficiencies in the recycling process. The Washington State Department of Ecology's Northwest Region Report (November 2016) demonstrated that plastic film, plastic bags, and glass are major contributors to contamination in commingled systems in Northwest Washington. Members of the Edmonds City Council, the Washington Department of Ecology (DOE), and the recycling coordinator for the City of Edmonds, Steve Fisher, have directly identified these two sources of contamination as a major concern for the City of Edmonds.

Plastic Bags and Film

People are confused about how to recycle plastic film and bags

It isn't entirely clear to people that plastic bags and film are not accepted in the curbside system, because plastic bags and film are recyclable materials. Plastic bags and film are collected separately in public bins at some large grocery stores and from certain commercial sources. However, plastic bags and film are viewed as contaminants when mixed with curbside materials. This means that the Material Recovery Facilities (MRFs) are receiving contaminated material, despite the fact that they are receiving materials with potential for recovery. The misunderstanding of what to do with these materials leads to improper disposal, as well as the eventual waste of what could have been usable.

Sorting machinery at Material Recovery Facilities is not designed to work with plastic bags and film

When plastic bags and film enter sorting machinery that is designed for materials of a different nature, it can mean a complete shutdown of the entire facility in order to "unclog" the gears. It goes without saying that this is an inefficient use of time and labor for those working in the MRFs. In fact, the DOE's Northwest Regional Report states that the removal of plastic bags and film from sorting machinery accounts for 20 to 30 percent of labor—labor which could, and should, be focused elsewhere.

The nature of these materials makes them highly prone to intermingling with other recyclables

Paper and cardboard are especially vulnerable to contamination by plastic bags and film. If paper bales are contaminated by plastic bags and film, they are considered landfill material.

Glass

Recycling glass saves energy and reduces carbon emissions

According to the DOE's Northwest Region Report, a one-ton reduction in CO2 emissions is achieved for each six tons of recycled glass used. In addition, other pollutants that result from glass production, such as particulates, nitrogen oxides, and sulfur oxides, can be reduced when cullet is used in place of newly produced glass. Using recycled glass instead of newly produced glass can be a big player in climate change progress, as well as preservation of air quality. More information on the environmental benefits of recycling glass can be found in the DOE's Northwest Region Report mentioned above (see sources).

Glass breaks throughout the entire collection process

Due to the fragile nature of glass, it can easily break into smaller pieces as it is collected, transported, and sorted. Small glass shards contaminate other recyclable materials, especially paper and cardboard, by adhering to those materials. The shards also pose a danger to workers. Since glass itself has a low market value, the larger issue is that broken glass contaminates recyclables that do have a high market value, such as paper.

Proper disposal of glass does not guarantee proper recovery

The current single-stream system puts all recyclables at risk for contamination, even with proper participation from residents, strongly implying that the system is at least one of the main problems.

Project Description

Goal

To reduce contamination rates in Edmonds' single-bin recycling system by removing glass bottles and jars, plastic bags, and wrap and film from the commingled curbside recycling.

Objective 1

Begin a city wide campaign within the City of Edmonds, reminiscent of Vancouver, Washington's "Recycling Done Right," that addresses the issue of contamination. This can be accomplished by conducting a baseline study against which to measure the progress system modifications, improving communication with the MRF's and haulers, providing educational resources, incentivizing the citizens of Edmonds, and providing direct feedback.

Through the use of tools provided by the Recycling Partnership,[1] deployment of temp workers, and collaboration with the haulers, this objective can be accomplished in the following parts.

Initiate a baseline characterization study of the materials being received

The city of Vancouver and Clark County hired the environmental consulting firm, Green Solutions, in an effort to gain an adequate idea of the amount and types of recycling being collected (Code Green). A similar process is recommended in order to gather information. The study will include information from the transfer stations and haulers, as well as a survey of materials being received at the transfer stations. This study will result in data regarding the composition of the commingled recycling and create a baseline from which to measure progress in subsequent years.

Educate the public and provide incentives for good recycling practices

The educational outreach should include a user friendly and interactive web page. Boulder County, Colorado, and Clark County, Washington, are good examples of effective web resources (links posted below). Additionally, the public is informed through bill-inserts and posters on the recycling carts themselves. The Recycling Partnership provides free templates, which are a cost effective resource to quickly implement these tools. In order to evaluate the effectiveness of the posters, we propose initially adding these to a test sample of the carts to get a sense of effectiveness.

http://www.ecocycle.org/recycle-compost-reuse

http://clarkgreenneighbors.org/

Provide direct feedback on recycling practices through cart tagging

Residents can receive direct feedback through the increased usage of cart tagging. This process is completed by workers glancing into the tops of residents carts on pickup day, looking for obvious signs of misplaced materials, and then leaving an "oops tag" if a source of contamination is observed. While this process can be completed by the haulers, all three of which have utilized this tool selectively in the past, it may be more effective to deploy temporary workers ahead of time to

[1] Recycling Partnership is a nonprofit organization which forms private/public partnerships to improve recycling nationwide.

ensure this is completed without decreasing the efficiency of the haulers. The Recycling Partnership provides the template for an "oops tag," which would help create uniformity between the different hauling districts. While this can be a labor-intensive aspect of the solution to the contamination issue, Vancouver saw a large reduction in contamination after using this tool (Clean Cart Campaign 2015). Vancouver was able to provide feedback to 20 percent of the recycling households in the city by tagging carts. Within the carts of households who received "oops tags," there was an observed 40 percent reduction in plastic bag contamination and a 22 percent reduction in overall contamination (Clean Cart Campaign 2015). Customers may not always be aware that they are using the commingled system incorrectly, which means education is an important step in the solution. The Recycling Partnership recommends, "Direct feedback to residents is extremely powerful. Update these 'oops tags' with the top materials that are causing your MRF problems, and print enough for every household you service." (Recycling Partnership)

Devise incentives

The City of Vancouver, Washington, circulated an informational video in order to inform citizens of correct recycling habits. The video provides a quick and fun way for community members to gain the appropriate information. After watching the video, participants were able to take a quiz and receive direct feedback on their knowledge. There is also the incentive of moderately priced prizes for participation.

The City of Bellingham also implemented a useful incentive program that could be modified to work for recycling. In the Smart Trips program, citizens are rewarded for trips taken using alternative modes of transportation. Based on the number of trips taken, people are able to enter to win prizes and be eligible for discounts at local businesses. A similar program would be effective for recycling in Edmonds.

Given that the tools have already been provided by the Recycling Partnership, it is reasonable to believe that all of this could be in place by 2018.

Objective 2

Implement a uniform plastic bag/film recycling program at all five grocery stores in Edmonds, and increase public awareness through the use of the Wrap Recycling Action Program (WRAP) campaign tools in order to increase proper recycling of plastic bags, wrap and film.

WRAP is a campaign that would facilitate a partnership between the grocery stores in Edmonds, Trex,[2] and plasticfilmrecyling.org. The program would increase knowledge of the correct and most effective ways to recycle plastic bags, wrap and film, while providing a uniform design for receptacle bins through the following steps:

Facilitate cooperation between the five grocery stores in Edmonds

Deploy uniform recycling bins at each grocery store in Edmonds. It is important for the bins to all look the same, so people are familiar with the process and can easily participate at any of the active locations.

[2] Trex is a manufacturer of plastic composite lumber products. More information under "Partnering with a dependable buyer."

Increase educational outreach

Flyers posted at grocery stores, on recycling bins, on web pages, and as bill-inserts will educate residents on how to recycle plastic bags and film correctly.

The City of Vancouver, Washington found a 75 percent decrease in contamination from plastic bags and film after implementing the "Recycling Done Right" campaign (Vancouver WRAP Report, 2015). Additionally, there was an increase in reported awareness that "beyond bags" materials[3] can be recycled at stores from 44 percent to 51 percent. Also, an increase from 41 percent to 53 percent of customers who reported they knew these materials should not be put in the curbside carts. Acknowledging Vancouver's success, we recommend getting Edmonds involved with WRAP to educate residents on how to correctly recycle plastic bags and film, which will then improve efficiency at the MRFs.

Partner with a dependable buyer, TREX

Trex combines recycled materials from plastic bags, wraps and film with sawdust to make plastic composite lumber, which is a more sustainable and long-lasting product than traditional wood lumber. Trex also involves elementary schools in proper recycling of plastic bags, wrap and film by facilitating competitions between schools via the "Trex Plastic Film Recycling Challenge." Between 21 schools, 11,800 pounds of plastic was collected over a five-month period (City of Vancouver).

Vancouver was able to implement WRAP bins in its grocery stores and all over town within six weeks of starting the process. We believe that Edmonds has equal potential, if not more, to get involved with this project and see results by 2018, if all goes as planned.

Objective 3

Update the city recycling ordinance to remove glass bottles and jars from the current list of collectable materials in the curbside system and develop alternative disposal methods. Options to keep glass containers collected as recyclables are outlined here.

By no means is this objective an easy one. However, an overwhelming part of the issue is caused by the current system. If the issue is to be taken seriously, a change in the system is absolutely crucial. Below are several potential solutions:

Re-introduce a dual-stream curbside recycling system

Studies show that dual-stream systems generate significantly less contamination rates from glass than single-stream systems, meaning more material is actually recycled. On average, only 60 percent of glass from single-stream recycling gets recycled. In comparison, 90 percent of glass is recycled in dual-stream systems, and bottle drop systems on average recycle 98 percent of their yield into new glass bottles and containers (Container Recycling Institute 2009, p.6).

[3] "Beyond Bags" is the phrase Vancouver, Washington, used to refer to materials other than bags which can be recycled, such as the film that wraps a 24 pack of soda.

Implement a bottle-drop facility

Establishing glass drop-off locations throughout Edmonds will remove glass from the curbside collection and increase quality of clean, recyclable glass material. Quality is preserved in two ways. First, contamination of other materials (paper and cardboard) from glass is reduced, producing marketable products. Second, glass that may have shattered and contaminated other material is now recycled, as glass cannot contaminate itself. Additionally, haulers will save money due to reductions in employee injuries sustained from glass and damage to truck beds caused by broken glass (Department of Ecology 2015, p.28-29).

Include redemption incentives

Edmonds could offer monetary reimbursement of glass recycling to households that prove their residency when dropping off glass bottles and jars at a bottle-drop facility. A monthly cap for reimbursement (for example, $20) would prevent exploitation of the offer and would allow the city to calculate the exact budget prior to implementing the program. For example, the city would multiply the number of households which are currently recycling customers by the reimbursement cap to find the greatest possible total cost of reimbursement each month.

Lobby for a statewide bottle bill

States that have a bottle bill in place have significantly reduced contamination rates when compared to states without a bottle bill. Contamination rates for states with bottle bills are on average 2 to 3 percent, compared to 15 to 25 percent within states that collect glass curbside (Department of Ecology 2015, p.31). Therefore, we strongly recommend that Edmonds support legislation that proposes a state-wide bottle bill.

Glass is contaminating otherwise clean recyclable material in the single-stream system. By removing glass bottles and jars from the curbside system, contamination rates can be lower. In addition, by establishing bottle-drop facilities, Edmonds can ensure increased quality from the now-separated glass. The success of this project could serve as a model for the rest of the county and state, potentially leading to a state-wide bottle bill.

Annual Expenses Estimate:

Baseline Audits:	$4,400.00
Oops Tags:	$900.00
WRAP Collection Bins:	$550.00
Outreach Materials:	$5,600.00
TOTAL	**$11,450.00**

***** *These numbers are based on budget information collected by the City of Vancouver, tailored to fit a city the size of Edmonds.*

Baseline audits

If Edmonds follows through with the baseline audit recommended in objective 1, the city can expect to spend about $4,400 upon temporary labor. Materials the workers need to give direct feedback to residents will probably cost an additional $900. These numbers are based on information collected from Vancouver's "Recycling Done Right" campaign, adjusted to fit the population of the City of Edmonds (a breakdown of these numbers can be seen in the image below).

Plastic Bags and Film Collection Bins

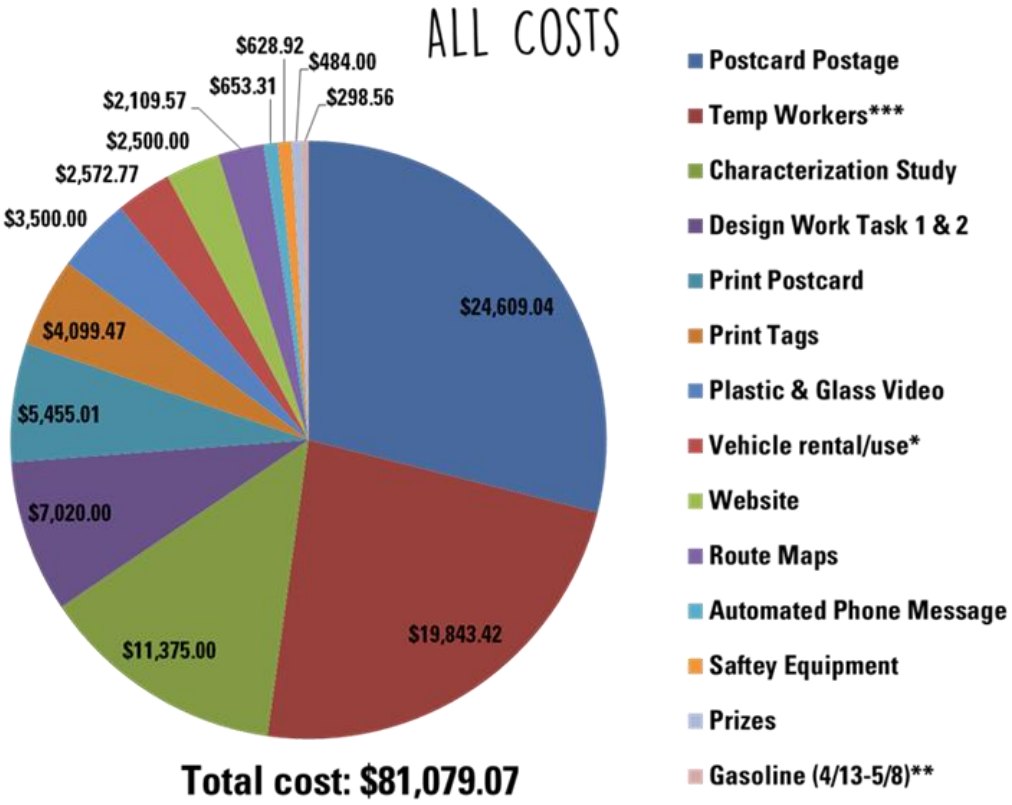
Involving Edmonds with the WRAP campaign means purchasing new, uniform bins for the grocery stores around the city. A 95-gallon recycling bin costs about $110 on average. Because Edmonds has five major grocery stores, the estimated cost is about $550.

Outreach materials

Educational materials such as posters, bill inserts, and flyers are necessary parts of the outreach program. The expected cost is about $5,620 for the City of Edmonds. Again, the cost of these materials is based on numbers collected by the City of Vancouver's Recycling Done Right program.

Glass Bottles and Jars

Regarding the cost of alternative disposal methods for glass bottles and jars, further investigation is necessary. Too many variables were discovered, going beyond the reasonable level of effort expected in an 11-week course. Questions about the feasibility of each option outweighed any consideration of cost. Some foreseen expenses for glass collection include glass collection storage containers to be placed outside of grocery stores, residential collection bins to allow separated glass disposal, and outreach materials to inform citizens of correct recycling practices.



Conclusion

As the population in Edmonds continues to grow, the infrastructure must simultaneously improve. Transitioning to a more effective recycling system will contribute to the accomplishment of a zero-waste future and more sustainable community. By involving Edmonds in WRAP, altering its curbside program to omit glass bottles and jars, and encouraging legislation for a state bottle bill, Edmonds would be contributing to the future health of its population and environment. These plans could create a model for surrounding cities, as well as the rest of Snohomish County. Edmonds has the potential to brand itself as a city of progressive environmental stewardship, serving to lead the way for its larger neighbors.

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CONSTRUCTION & DEMOLITION WASTE: CONSTRUCTING A CLEANER FUTURE

Manny Larrain, Hunter Philip, Megan Peda, Drew Ault

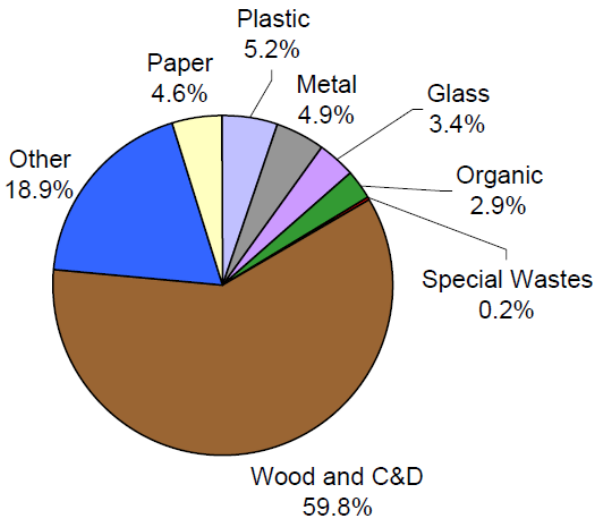
Executive Summary

As communities across the world begin to realize the importance of sustainability, efforts to reduce waste and consumption are required to move society toward a better future. Edmonds, Washington, is one city to come to this understanding in the form of its *Climate Action Plan* of 2012 and Resolution 1357, which mandates a zero-waste program in the hopes of a more sustainable future.

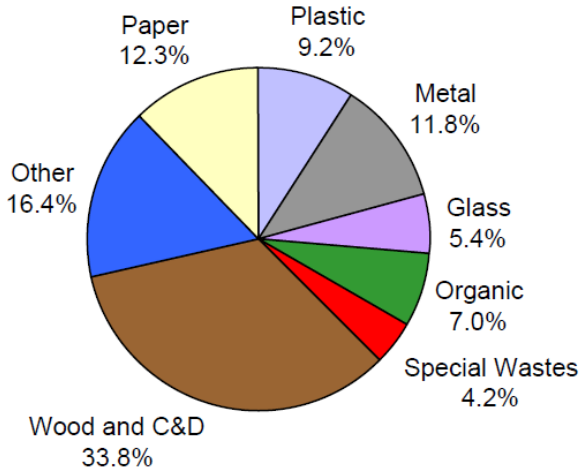
Problem

Construction waste is one waste stream that needs to be minimized in order to achieve a greener future. Waste from construction and demolition (C&D) contains many materials that can be reused and/or recycled. In Snohomish County, wood and C&D waste constitute 33.8 percent of the residential self-haul waste stream and 59.8 percent of the non-residential (i.e., businesses and commercial buildings) self-haul waste stream (see figures below).[1] Since 1979, there has been a growing volume of wood-waste reaching the landfill. Historically, Snohomish County has seen local contractors bring 10,500 tons of C&D waste in 2012, 24,400 tons in 2013, and 75,900 tons in 2014. Currently, most of the wood-waste recovered from project sites is used as hog fuel, which contributes to air pollution.

Non-residential Self-Haul



Residential Self-Haul



Source: *Snohomish County Waste Composition Study* of 2009, Figures 5 and 6.

Solutions

We recommend that the City of Edmonds develop a project-specific Construction Waste Management Plan (CWMP) tool, which would include specific policies and guidelines to help builders use better and cleaner methods for a given project. The CWMP would incorporate the following:

- Deconstruction ordinance
- Education on acceptable recyclables
- Directions and contacts with appropriate waste haulers for the project
- Salvage assessment
- Waste log

Effective deployment of the CWMP, paired with a program to sponsor contractors to pursue LEED or BUILT GREEN certifications would allow for future projects to align with Edmonds' *Climate Action Plan*.

We have looked at different methods, implementations, efficacy, costs, and results to develop our recommended CWMP. Our research centered upon successful projects here in the Northwest and select locations along the West Coast, and we thus believe the CWMP tool would be effective in Edmonds. In a city of this size, with the problems it is facing, the CWMP is anticipated to be usable by stakeholders and beneficial to the environment.

Statement of Need

The City of Edmonds is working toward a zero-waste goal and a more sustainable future. In 2016, the Washington State Department of Ecology produced a study which compiled information about material loss and recovery across various collection and recycling systems. The study noted that 18.7 to 26 percent of construction and demolition (C&D) materials present within a commingled waste stream are "lost" (i.e., are sent to landfill), meaning that from 74 to 81.3 percent are "utilized." Some of these materials include metals, paper, plastics, glass, and debris.[2] Focusing on C&D self-hauling, the method employed by many contractors, the *2009 Washington Statewide Waste Characterization Study* noted that "wood debris" comprises 40.9 percent of the waste stream, and other "construction materials" comprise an additional 43.4 percent.[3]

Utilization means the materials are being used to make new products, or are otherwise used beneficially. Loss of materials and the inability to reuse them for future products means they are reaching landfills and contributing to greenhouse gas emissions. The Construction Waste Management Plan (CWMP) tool we recommend below will help developers and haulers prevent C&D waste from reaching the landfill. The CWMP will serve as an initial model for policy makers such as the City of Edmonds and Snohomish County to implement a strategy to reduce C&D waste. This CWMP will contain an acknowledgment form, a construction waste management planning form, and a salvage assessment form. These forms will serve as tools for Edmonds to maintain contact with construction and demolition managers and monitor the way in which they dispose of waste. These documents have been selected and formulated based upon CWMPs of other cities around the United States. The city of Barstow, California, has a CWMP tool for their primarily residential population of 23,000, which is half the population of Edmonds. They utilized a salvage assessment sheet, acknowledgment form, and construction management plan to prevent wastes from reaching the landfills; these same forms are recommended for Edmonds.[4]

The need to implement this CWMP stems from the agreements reached in the *Climate Action Plan* to reduce greenhouse gas emissions. Preventing construction waste from reaching landfills will allow Edmonds to target the core of the problem. Not only will waste be reduced, but a more efficient construction paradigm will be in place. Adhering to the proposed CWMP will provide contractors with the ability and resources to get certifications from LEED and BUILT GREEN. Both focus on making homes more energy efficient, built with reused and recycled materials in manners that produce the least amount of waste. Working with contractors to pursue these certifications by way of following the CWMP will promote the interests of the City of Edmonds to reduce waste and become a greener city.

Project Description

Objectives

Our recommended CWMP for the City of Edmonds will both educate contractors and improve the disposal and repurposing of C&D materials leaving work sites. The objective is to divert at least 75 percent of C&D material away from landfills, and ensure that it is being processed in the proper facilities with trained professionals and high quality control. We propose policies that require both construction management companies and waste hauling companies to uphold a level of responsibility and environmental consciousness. The policies address what is used and disposed of on site, as well as where those C&D materials are being deposited and/or recycled for future use.

With the proper regulatory constraints and professionally managed facilities, we believe this CWMP could provide a sustainable method of reducing the large percentage of C&D materials that continue to make their way into landfills.

Our goal is to decrease the inordinate space (up to 30 percent) that C&D materials take up in landfills by creating a more sustainable construction management system within Edmonds. Monthly facility check-ins and data records from waste haulers and facility managers, which include specific quantities and types of C&D materials entering and exiting a site, will assist in enforcing proper diversion of materials that need to be repurposed instead of going into landfills.

We would like to see this plan implemented by spring 2018, in order to allow for the allocation of grants and funds that would support the project. We believe this will give the construction companies, haulers, facility professionals, and other stakeholders enough time to adjust current methods to meet the requirements of the CWMP.

Methods

To achieve a goal of diverting up to 75 percent of C&D waste from landfills, contractors and the government must use the CWMP. As stated earlier, components include a construction waste management plan, acknowledgment form, and salvage assessment form. Each document will ensure that contractors planning to construct or deconstruct within Edmonds do so sustainably and with the minimal amount of waste. The CWMP outlines rules and regulations that the project manager must abide by to complete the intended project. The acknowledgment form establishes that the contractor understands the requirement of diverting 75 percent of its construction waste. Finally, the salvage assessment form advises the contractor which materials to look for and to tally how much is being diverted from landfill.

For each given project, documents will be finalized once the City of Edmonds and all involved third-party contractors agree on the mitigation percentage, the targeted materials, and the methods by which the materials can be appropriately repurposed or reused. These two facets of the project's methodology allow Edmonds to effectively reduce how much C&D waste reaches landfills. This has been the case for Portland, Oregon, and Barstow, California. Both cities have enacted CWMPs and have been successful in mitigating C&D waste and fostering the reuse of materials in future construction projects. For each city, the starting-point was establishment of a target diversion percentage, such as the 50-percent target established in Barstow. Their ensuing CWMP program then facilitated achievement of waste diversion without heavily burdening contractors. The CWMP recommended for Edmonds can be found in appendix figure 1.0.

Waste Log

We propose a thorough waste log for all deconstruction and new construction. A log requires contractors to account for volumes, types, sources, and destinations of materials. The waste log essentially itemizes the material being reused or recycled and its weight and destination, as well as the weight of material taken to landfill. The log also tracks construction waste that may contain hazardous substances necessitating a separate process. Waste log examples can be found in the appendix figure 2.0.

Salvage Assessment

Construction waste must be assessed and steered to the correct destination, whether it is recycled or sent to a landfill. Our plan would require salvage assessments at each construction and/or deconstruction site of 750 square feet or larger. Each material in the waste log then has a designated diversion method, hauler, and receiving facility. An initial assessment helps contractors determine which materials are salvageable for reuse. The city of Seattle uses this method, and it has been quite successful.

Destinations for Repurposed Materials

Along with a waste log and salvage assessment, we recommend the Edmonds clearly identify destinations that accept repurposed materials. Places such as King County have put together a network (the Northwest Building Salvage Network) for contractors to connect with regional salvage and reuse companies. Implementing a similar network in Snohomish County would help promote more reuse and salvage activity. Whether it is wood from cabinets or wood from the structure's frame, the inventory of destinations would ensure that materials are salvaged and repurposed.

Education on Recyclables

By implementing the recommended CWMP, Edmonds could create an entirely new market in the construction and demolition community, helping create jobs and increase the profitability of existing firms. To do this, educational programs must be developed to train people who work in the deconstruction industry. With the help of grants from Washington's Department of Ecology, Edmonds could create a training program through the Building Material Reuse Association.

Budget

Portland, Oregon, provides an example of a potential project budget. Portland developed a waste management plan to help implement deconstruction of historical sites and houses built before 1916. Portland was able to receive all necessary funding from state grants. The city received $100,000 from Oregon's Solid Waste Management Fund and the Department of Environmental Quality. The Solid Waste Management Fund awarded a $50,000 grant, which came from a percentage of the tipping fees that are imposed at dumpsites and landfills. The Department of Environmental Quality also gave a grant of $50,000 for providing workforce education, training, and certification so that trained workers were ready to tackle deconstruction jobs.[5]

In Edmonds, we recommend considering state grants that will not conflict with funding received from Coordinated Prevention Grants. Discussions could take place with the Department of Ecology to identify any such grant programs. Another option is to look at grants available through the EPA and HUD. Past grants from HUD have been as large as $500,000, based upon performance.[6] Two that Edmonds could apply for are the "Transformation Initiative Research Grants: Demonstration and Related Small Grants" (CFDA 14.525), and the "General Section to HUD's Fiscal Year 2016 Notice of Funding Availability for Discretionary Programs" (CFDA 14.506).[7] Additional investigation of possible grant programs is within the realm of work that could be performed by other students later this academic year.

Conclusion

In Edmonds, developing a CWMP program would bolster local construction companies while working to reduce environmental impacts. All parties involved with projects that generate volumes of unwanted materials need to be held accountable. More can be done than simple disposal of materials in a landfill. This CWMP could serve as model for other industries within Edmonds to rethink and implement new sustainability policies to make progress toward a zero-waste goal.

The CWMP we propose helps redirect and recycle construction waste, educates the public on the proper disposal of C&D waste materials, and makes construction companies accountable for achieving a cleaner construction waste management stream.

References

1. "2009 Snohomish County Waste Composition Study," Figures 5 and 6, p. 15, 16, retrieved at: http://www.green-solutions.biz/snohocowastecomp2009final.pdf
2. Washington State Department of Ecology, "2016 Materials Recovery & Use Study," Table 1, p. 6, retrieved at: https://fortress.wa.gov/ecy/publications/documents/1607007.pdf
3. "2009 Washington Statewide Waste Characterization Study," Figure 4, p. 2, retrieved at: https://fortress.wa.gov/ecy/publications/documents/1007023.pdf
4. City of Barstow plan components may be reviewed at http://www.barstowca.org/business/construction-waste-management
5. Wood, Shawn. "Deconstruction Interview." Telephone interview. 5 Oct. 2016.
6. "Transformation Initiative Research Grants: Demonstration and Related Small Grants", CFDA 14.525, Department of Housing and Urban Development.
7. "General Research and Technology Activity," CFDA 14.506, Department of Housing and Urban Development.

Appendix

Figure 1.0, Construction Waste Management Plan

Construction Waste Management (CWM) Plan

Project Name: _____

Job# _____

Project Manager: _____

~City of Edmonds Contract Administrator/Solid Waste:

All Subcontractors shall comply with the project's Construction Waste Management Plan.

All Subcontractor foremen shall sign the CWM Plan Acknowledgment Sheet.

Subcontractors who fail to comply with the Waste Management Plan will be subject to back charges or withholding of payment, as deemed appropriate. For instance, Subcontractors who contaminate debris boxes that have been designated for construction material will be subject to back charge or withheld payment, as deemed appropriate.

1.The project's overall rate of waste diversion will be no less than 75%.

2. This project shall generate the least amount of waste possible by planning and ordering carefully, following all proper storage and handling procedures to reduce broken and damaged materials and reusing materials whenever possible. The majority of the waste that is generated on this jobsite will be diverted from the landfill and recycled for other use.

3. Spreadsheet 1, enclosed, identifies the waste materials that will be generated on this project, the diversion strategy for each waste type and the anticipated diversion rate.

4.Waste prevention and recycling activities will be discussed at the beginning of weekly subcontractor meetings. As each new subcontractor comes on-site, the Project Foreman will present

him/her with a copy of the CWM Plan and provide a tour of the jobsite to identify materials to be salvaged and the procedures for handling jobsite debris. All Subcontractor foremen will acknowledge in writing that they have read and will abide by the CWM Plan. Subcontractor Acknowledgment Sheet enclosed. The CWM Plan will be posted at the jobsite trailer and/or made available along with the Building Inspection card.

5.Salvage: Excess materials that cannot be used in the project, nor returned to the vendor, will be offered to site workers, the owner, or donated to charity if feasible.

6.Certified construction waste hauling companies will provide a commingled drop box at the jobsite for most of the construction waste. These commingled drop boxes will be taken to the Edmonds Landfill where they will be weighed and qualifying material pulled out for diversion. It is the responsibility of the contractor to contact Certified construction waste hauling companies and arrange for removal and return of the bins as long as the job site is in operation.

a. Care must be taken to not put any putrible trash, food waste, etc. in the rolloff box. This would result in having to have the rolloff box emptied no less than every 7 days.

b. When non-putrible materials that can be recycled are collected in the rolloff box, the container needs to be emptied once every 30 days.

7.In the event that the waste diversion rate achievable via the strategy described in (6) above, is projected to be lower than what is required, then a strategy of source-separated waste diversion and/or waste stream reduction will be implemented. Source separated waste refers to jobsite waste that is not co-mingled but is instead allocated to a debris box designated for a single material type, such as clean wood or metal.

Notes:

1. Waste stream reduction refers to efforts taken by the builder to reduce the amount of waste generated by the project to below four (4) pounds per square foot of building area.
2. When using waste reduction measures, the gross weight of the product is subtracted from a base weight of four (4) pounds per square foot of building area. This reduction is considered additional diversion and can be used in the waste reduction percentage calculations.

8. Certified construction waste hauling companies and the Scale House Operator at the landfill will track and calculate the quantity (in tons) of all waste leaving the project and calculate the waste diversion rate for the project. Certified construction waste hauling companies will provide the City and Project Manager with an updated monthly report on gross weight hauled and the waste diversion rate being achieved on the project. Certified construction waste hauling companies' monthly report will track separately the gross weights and diversion rates for co-mingled debris and

for each source-separated waste stream leaving the project. In the event that Certified construction waste hauling companies does not service any or all of the debris boxes on the project, the Prime General Contractor will work with the responsible parties to track the material type and weight (in tons) in such debris boxes in order to determine waste diversion rates for these materials. All receipts must be provided to the City Contract Administrator.

9. Debris from jobsite office and meeting rooms and lunch/food waste will be collected by Certified construction waste hauling companies. This must be done in barrels or bins apart from the Construction material.

Construction Recycling Requirements:

Asphalt Paving

Bricks

Cardboard

Concrete

Gypsum Scrap (New)

Metal

Wood (Clean)

Figure 2.0, Waste Log

Material	Diversion Method	Hauler	Receiving Facility
Individual Materials			
Asphalt Paving *	Choose Selection	Choose Selection	Choose Selection
Asphalt Shingles		Bobby Wolford Trucking and	
Brick (whole)*			
Carpet/padding			
Concrete *			
Cardboard *			
Glass			
Gypsum/Drywall *			
Land Clearing			
Metals *			
Plastics			
Plastic Film Wrap			
Rock/Gravel			
Soil/Sand			
Wood *			
Other:			
Other:			
Hazardous Waste			
Recyclable Comingled Material			
List materials to be recycled:			
Mixed Non-recyclable Debris			

Building Component	Specific Material (Use drop-down list)	Notes
Wall Covering	Choose Selection	
Wall Covering		
Insulation		
Plumbing		
Plumbing		
Lighting Fixtures		
Wood		
Wood		
Wood		
Wall Sheathing		
Wall Sheathing		
Doors		
Doors		
Flooring		
Flooring		
Carpet		
Cabinets		
Windows		
Roofing		
Siding		
Siding		
Miscellaneous		