

Residuals Management

Operator of the Roosevelt Regional Landfill,
Ash Recovery Facility



Renewable Natural Gas Conversion Facility

Nick Ponce, General Manager

Jim Hutchinson, Director, Municipal Services

Presentation to Zero Waste Committee

July 12, 2019



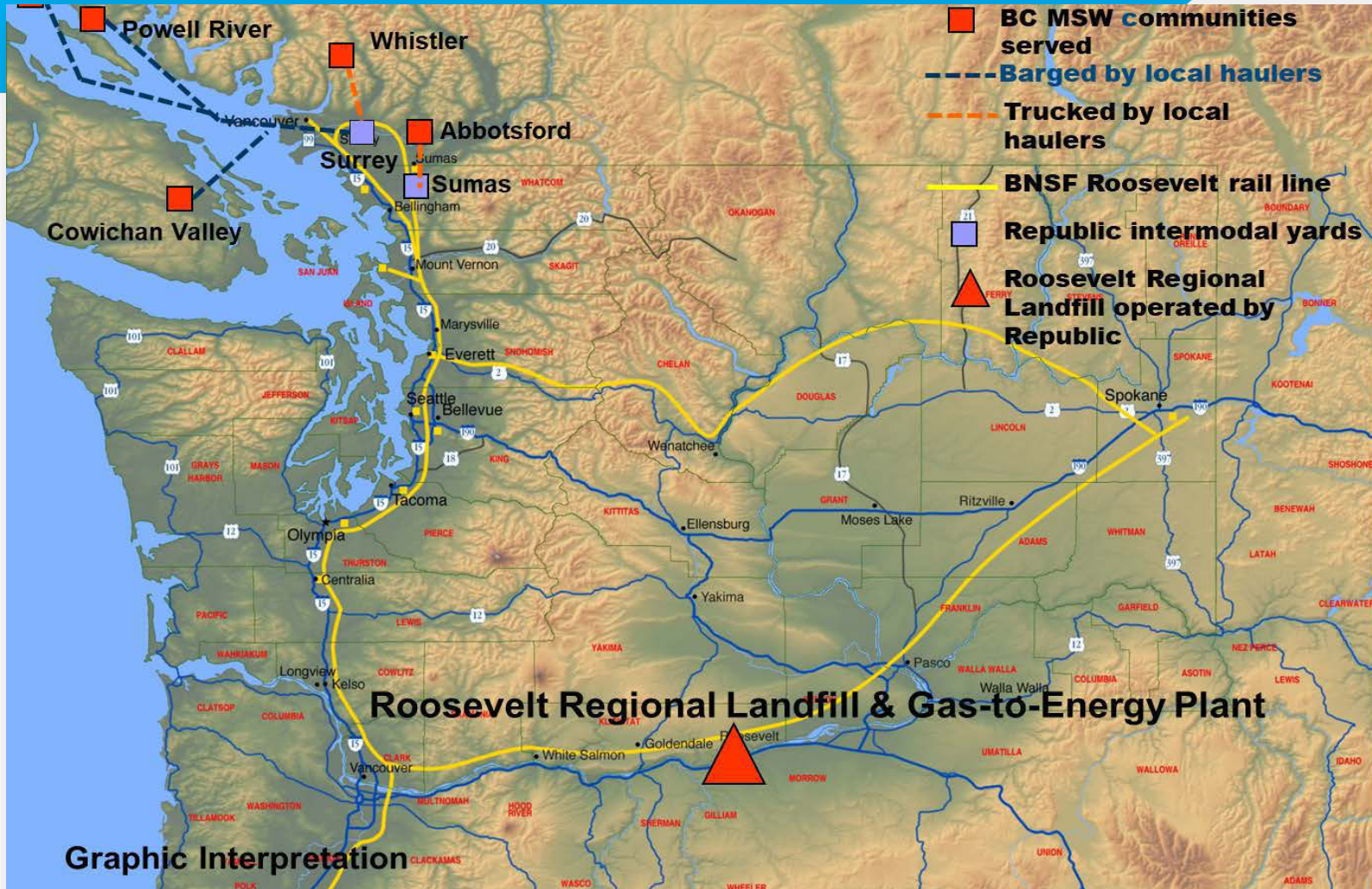
Republic's History in BC

Nearly 30 Years of Service

- Customers have included: Metro Vancouver, industrial generators, Newstech, Whistler, Cowichan Valley RD, qathet RD, Coastal First Nations and & Northern Affairs Canada
- Gas-to-Energy Plant generates renewable natural gas, distributed by BP North America
- Approved for receipt of solid waste in the Pacific Northwest: BC, AB, WA, OR, ID, CA & AK
- Operates under the Klickitat County Comprehensive Solid Waste Management Plan approved by Washington State

Currently approved in BC Solid Waste Management Plans

Waste-by-rail network



Most carbon-efficient and economical means of transport

Roosevelt Regional Landfill

Residual Management Facility



- Accepted first load of waste in 1990
- Nearly 60 million tons of residuals in place
- Permitted for 245 million tons, 75 year life at current fill rate of 2.5m tons/year
- Only 6-9 inches of rain/year

Built for energy recovery from Day One

Metals Recovery: Ash Monofill

- Republic Services and Lab USA operate a metals recovery mining operation at Roosevelt Regional Landfill
- The facility will recover and recycle more than 46,200 tons of ferrous metals and 42,900 tons of non-ferrous metals



That's enough ferrous metal to build SIX Eiffel Towers!

Landfill Gas-to-RNG Facility



1999 "LFG1" project

- 10.5 Mega-watt Reciprocating Engine Project (idled)



2010 "LFG2" (Turbine Project)

- 26 MW Combined Cycle Turbine plant
Gas cleaning system to remove sulfur from gas (backup power)



2018 Renewable Natural Gas (RNG) Facility

- 5700 MMBTU/day (enough to fuel 1500 solid waste trucks a day!)

History of biogas recovery and innovation

ISWRM Plans Goals

Republic Services: Part of the Solution

1. Minimize Solid Waste Generation

Solution: Contracts with Republic can be scaled based on residual volumes requiring responsible disposal

2. Maximize Reuse, Recycling and Material Recovery

Solution: Regional districts & municipalities increase these programs when not financially committed to building new infrastructure

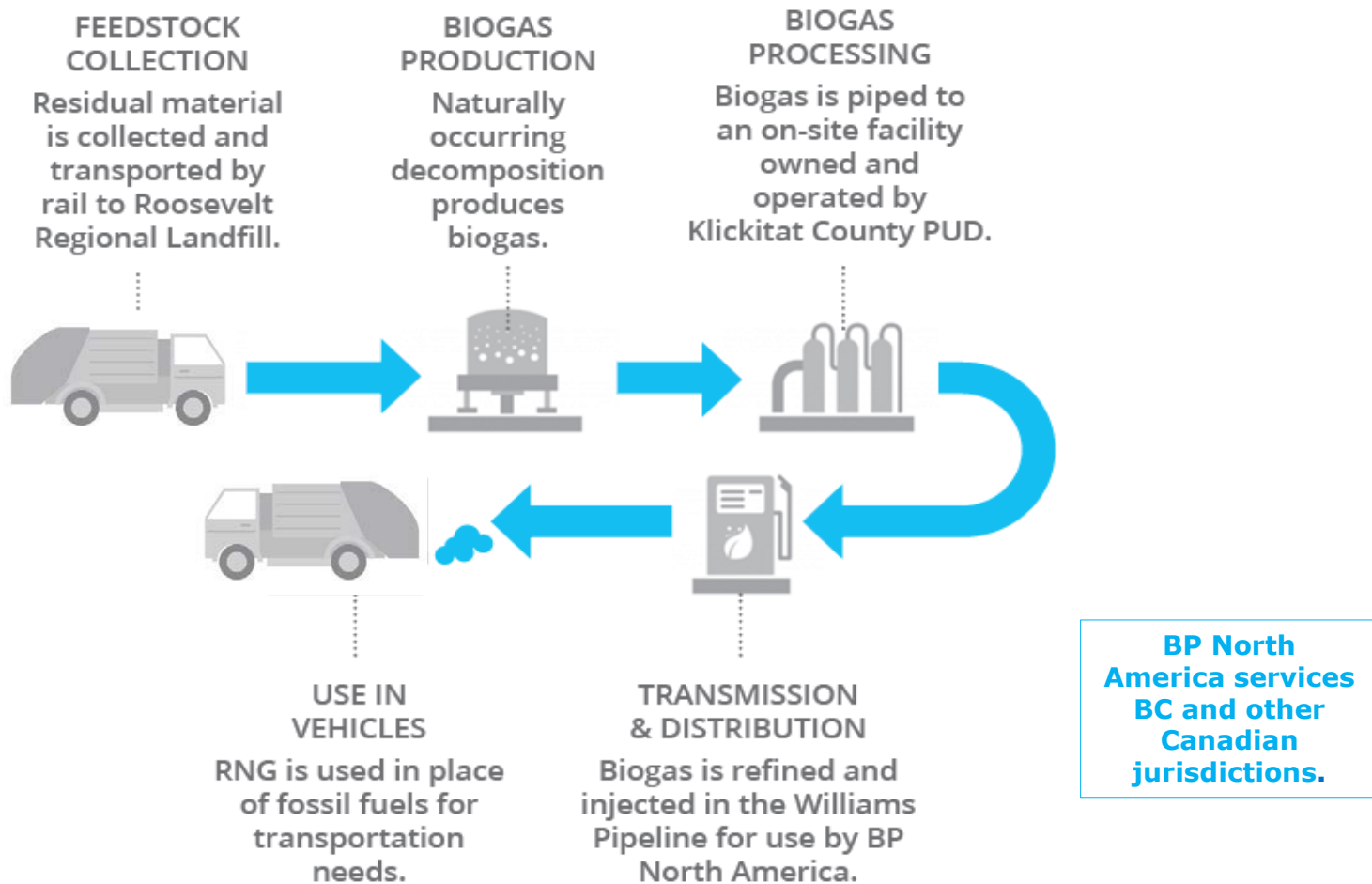
3. Recover Energy from the Waste Stream after Material Recycling

Solution: Largest landfill RNG facility in North America generating 36,000 DGE (diesel gallon equivalent) each day. Able to recover metals from incinerator ash.

4. Dispose of all Waste in Landfill After Material Recycling and Energy Recovery

Solution: Roosevelt is a cost effective and environmentally sound addition to Metro Vancouver's disposal capacity

Fueling the Circular Economy



Thank you!

Nick Ponce

General Manager

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Appendix



Republic Services at a Glance

Fortune 500 / RSG

14 million

customers

33,000+

employee

5 million

Annual tons of recycling processed

2.5 million

Annual tons of solid waste converted to
Renewable Natural Gas at Roosevelt
Regional Landfill in Washington State

2.4 percent

From Metro Vancouver



Natural geology meets advanced engineering

- **1,500 feet** of separation from the bottom of the landfill to the closest regional aquifer
- Tests of the clay demonstrate it would take approximately **15,000 years** for water to move through the natural barrier
- **Engineered liners** include a two-foot thick, re-compacted natural clay layer and a 80 mil high-density, flexible membrane liner (FML) that exceeds the regulatory prescribed 60 mil primary FML, and a geotextile overlay
- **Comprehensive** leachate and methane collection and control systems
- The site receives **only 6-9 inches of precipitation** per year

At Republic, residuals continue to be recovered & recycled to a higher and best use



2019-2022 Board Strategic Plan

SOLID WASTE SERVICES

Ann Rowan

MANAGER, COLLABORATION & ENGAGEMENT,
EXTERNAL RELATIONS

Zero Waste Committee Meeting: July 12, 2019

30388096

Megan Gerryts

CORPORATE PROJECTS COORDINATOR, CAO
EXECUTIVE OFFICE



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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Board Strategic Planning Workshop

- 30-Year Planning Context
 - Regional Growth
 - Environmental Sustainability
 - Financial Sustainability
 - Regulatory and Legislative Environment
 - System Stewardship
- Visioning Exercise
- Strategic Directions



2019-2022 Board Strategic Plan

- *Board Strategic Plan* context
- Organizational overview
- Vision and mission
- Strategic directions
 - Regional Federation
 - Water Services
 - Liquid Waste Services
 - Solid Waste Services
 - Regional Parks Services
 - Housing Services
 - Regional Planning
 - Air Quality & Climate Change

Common Themes

- Commitment to long-term financial planning
- The importance of infrastructure resilience
- Value of collaboration
- Leadership on climate action
- Innovation in projects and operations

Success of Future Generations

Protect People and the Environment

People

Attracting and Keeping Young People

Regional Prosperity

Circular Economy

Quality of Life

Financial Sustainability

Natural beauty Bring Joy

Partnerships

Zero Waste

Carbon Neutral

Anticipate Growth

Effective Governance and Service Provision

Healthy Place to Live

Productive Lands

Core Utilities

Economies of Scale

Fully Connected Public Transportation System

Thriving Economy

Balance

Culture that Embraces and Drives Innovation

Diversity

Manage Resources

Families

Improved Health and Well-Being

Serve the people of the region

Shared Services

Equitable Distribution of Incremental Costs

Sustainability

Manage Growth

Improve Livability

Collaboration

Engaged Public

Expanded Housing Authority

Innovation Resilience

Affordability

Shared Responsibility

Stewardship

Custodians of the Region

Regional Vision

Regional thinking

Future Generations

Expanded Scope

Prepared

Provide Services

Embrace sustainable principles and practices

Clean Water

Clean Rivers and Oceans

Human Health

Leadership

Culture of Collaboration

Complete Communities

Adaptable

Inclusive

Strategic Directions: Solid Waste Services

1. Managing our Solid Waste
2. Ensuring Financial Sustainability
3. Fostering Collaboration and Engagement

Next Steps

- Final document to Finance and Intergovernment Committee
July 17, 2019
- Board approval July 26, 2019
- 2019 – 2022 Board Strategic Plan will guide development of
annual budget and work plan and five-year financial plan



Comments?



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1. Managing Our Solid Waste

Reduce waste, increase recycling, and increase recovery of materials and energy from remaining waste. Dispose of residuals in a cost-effective and environmentally sustainable manner.

- 1.1 Expand actions that will reduce the amount of litter and waste that members manage.
 - Work with members, the provincial government, and the federal government on strategies to reduce single use items and other consumer products.
- 1.2 Continue to develop programs and related communication campaigns that increase diversion rates of materials that can be reused, repurposed or recycled.
 - Continue to expand and enhance the disposal ban program.
 - Identify upstream and recycling solutions with the region that will reduce the volume of solid waste generated in the region.
 - Focus on the multi-family residential and commercial/institutional sectors where recycling rates are lower.
 - Continue to expand recycling options at regional transfer stations.

1. Managing Our Solid Waste

1.3 Research opportunities to close the gaps and ensure sufficient capacity in the regional recycling and waste diversion system.

- Work with the private sector to innovate in the provision of recycling solutions, including micro-solutions.
- Assess Metro Vancouver's role in processing organics and wood.

1.4 Identify future disposal alternatives and develop analysis for each, providing life cycle & full cost analysis including greenhouse gas emission estimates.

2. Ensuring Financial Sustainability

Develop and implement financial plans and policies that reflect a commitment to sound financial management and long-term planning, in consideration of current and future ratepayers.

- 2.1 Ensure Metro Vancouver is maximizing the recovery of materials and energy from the management of the regional solid waste system.
 - Assess the viability of implementing district heating at the waste-to-energy facility.
 - Seek out public and private partnerships to facilitate the recovery of materials and energy.
- 2.2 Perform on-going analysis of the impact of the tipping fee structure, both in terms of its ability to fund the system and to change behaviour.
- 2.3 Develop and implement a 30-year financial framework, providing members with financial projections associated with the regional solid waste system.

3. Fostering Collaboration & Engagement

Strengthen awareness and engagement with the public, members, other orders of government, and key stakeholders on a range of initiatives that will reduce waste generated in the region.

- 3.1 Utilize the potential of the National Zero Waste Council and the annual Zero Waste Conference to promote the importance of waste prevention and the value of transitioning to a circular economy.
 - Facilitate cross-sector collaboration to design waste out of products and packaging and to harmonize policies across Canadian jurisdictions that will both reduce waste and create economies of scale in remanufacturing opportunities.
- 3.2 Work with the provincial government and key stakeholders to expand the products included in extended producer responsibility (EPR) programs.
- 3.3 Continue to expand public education and behaviour change campaigns consistent with the objectives of zero waste.



Organics and Paid Recyclables Management at Metro Vancouver Transfer Stations

Sarah Evanetz, MPA

DIVISION MANAGER SOLID WASTE PROGRAMS
AND PUBLIC INVOLVEMENT

July 12, 2019



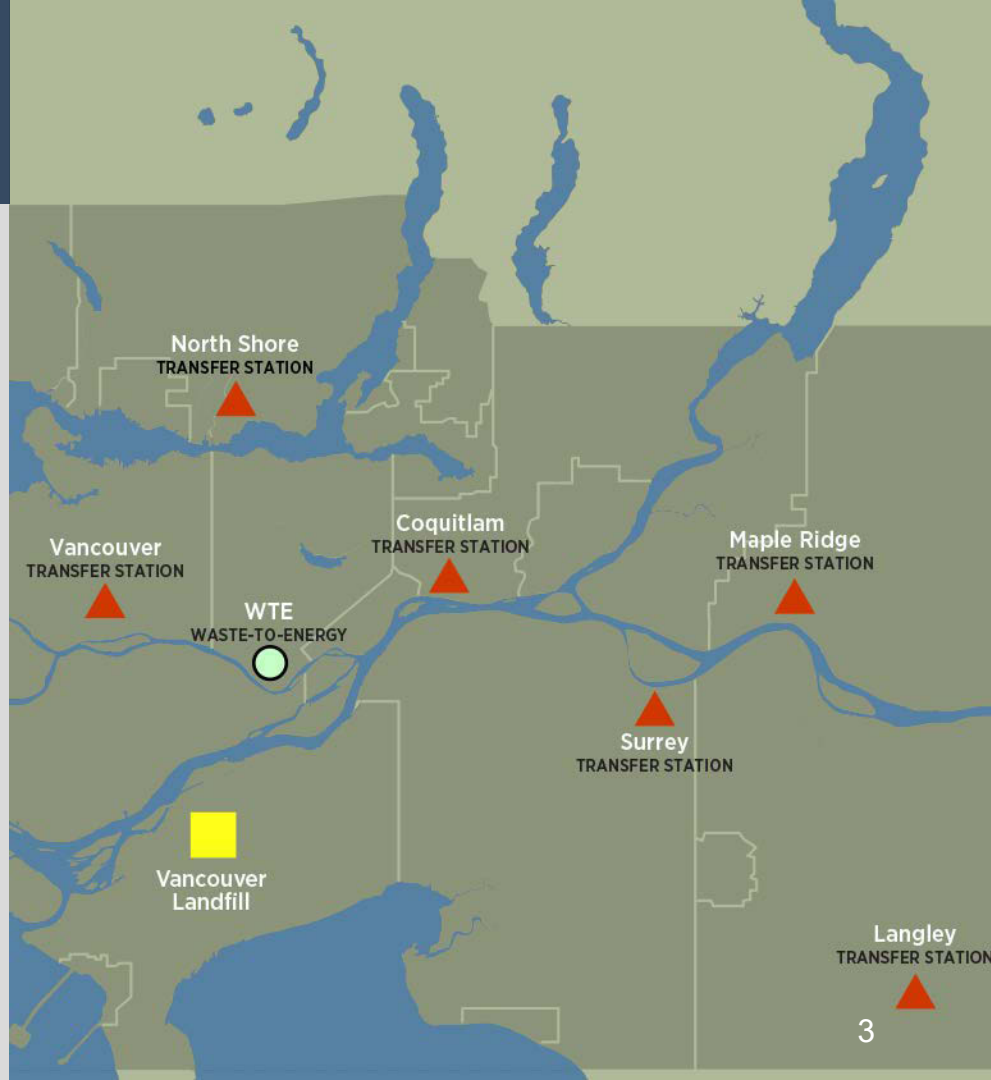
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Background

- 2011 Board approves Organics Strategy:
 - Development of organics processing capacity left to private sector and municipalities.
 - Receive yard trimmings and organics from municipalities when requested.
- 2017 RAAC/REAC Organics Management Workshop
- 2018 Board directs to report back with approach for paid recyclables
- 2019 RAAC/REAC Organics Management Workshop

Metro Vancouver Transfer Station Network

- Serves region's 2.5 million residents
- Convenient and accessible
- Full-service reuse, recycling and disposal facility



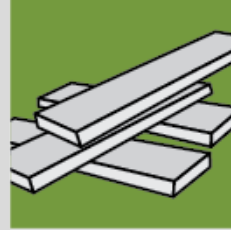
Paid Recycling



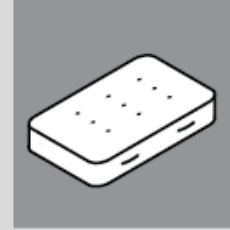
NEW GYPSUM



YARD



CLEAN WOOD



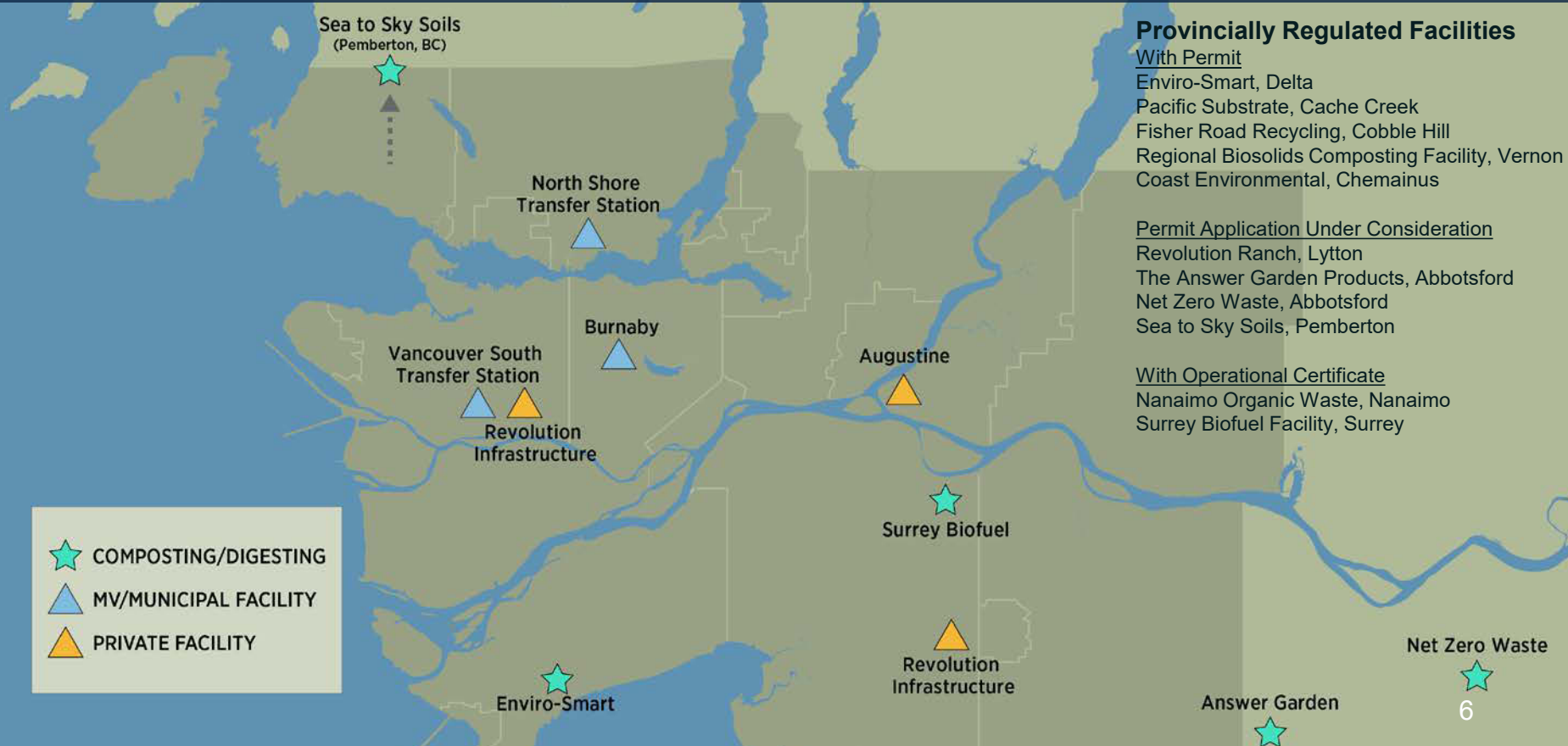
MATTRESSES

- Range of paid recycling services provided at all transfer stations
- Diverts 65,000 tonnes a year
- Fees typically cover operational costs
- Mattress fees lower than cost to help reduce illegal dumping

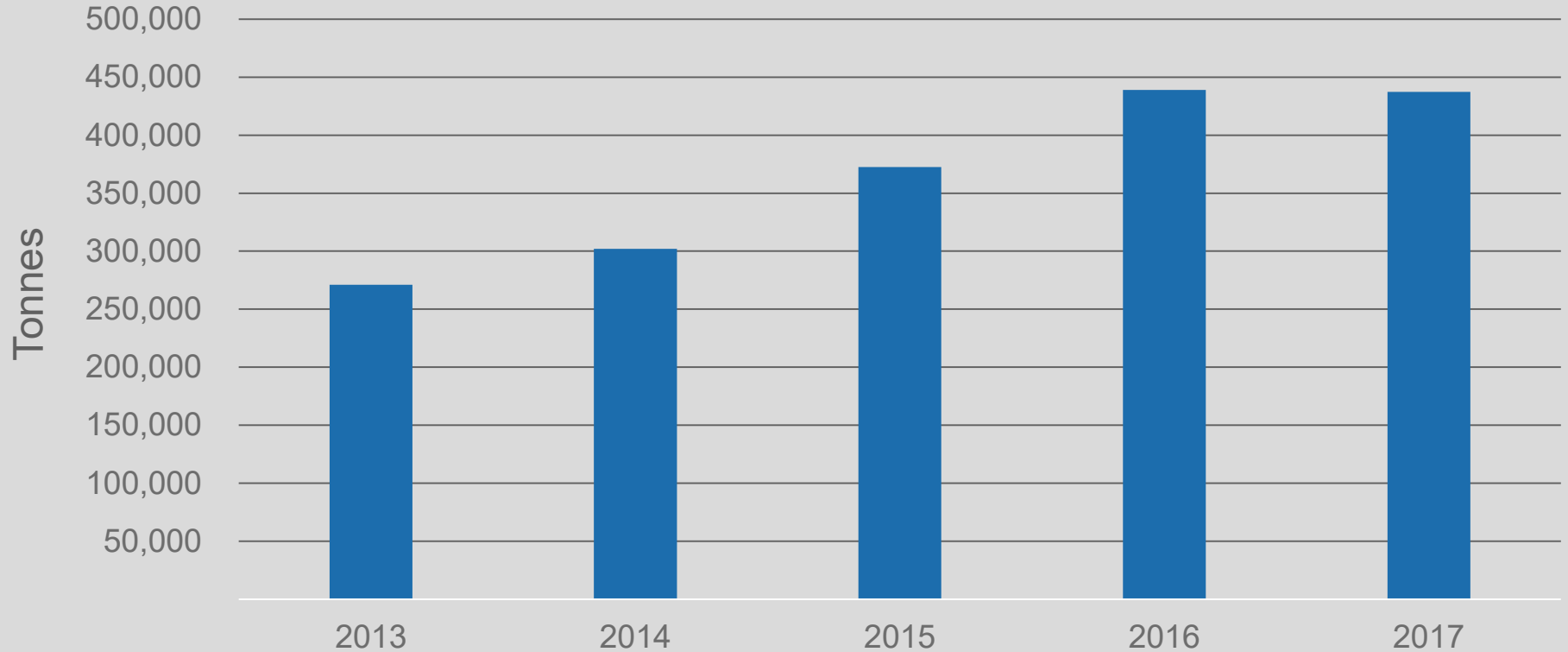
Organics Recycling

- 63% overall diversion rate; 68% organics diversion
- Achieved strong results through organics disposal ban and municipal organics collection programs
 - 60% increase in organics recycled from 2013 to 2017
- Challenges with odour and processing capacity
- Price increased significantly in past 2 years

Organics Transfer and Processing Infrastructure



Regional Organics Recycled



Organics Composted vs. in Garbage

Sector	Composted (t)	Remaining in garbage (t)
Yard Trimmings	110,000	<1,000
Single-Family Organics	215,000	50,000
Multi-Family Organics	30,000	70,000
Commercial Organics*	85,000	90,000
Total	440,000	210,000

* Includes institutional and commercial generators

Report Recommendations

- Provide paid recyclables services and charge operational costs
- Provide municipal organics transfer services upon request and under contract with full cost recovery
- Initiate procurement for processing services for municipal organics from the North Shore Transfer Station
- Develop business case for commercial organics transfer services at transfer stations



Thank you



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Alternative Fuel and Recyclables Recovery Project

UPDATE

Terry Fulton, P.Eng.

PROJECT ENGINEER, SOLID WASTE SERVICES

Zero Waste Committee Meeting, July 12, 2019



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Background/Purpose

- In March, Board approved developing a business case for material recovery pilot
- Presentation provides an update on project scope



Project Details

- Process waste to extract recyclable materials and create an alternative fuel
- Considering facility at Coquitlam Landfill
- 50,000 to 60,000 tonnes/year of small vehicle waste
- May include similar quantity construction and demolition waste

Small Vehicle Waste Composition

Wood	55%
Inert Materials	15%
Plastic	6%
Carpet Waste	6%
Green Waste	5%
Metals	4%
Paper	3%
Bulky Objects	3%
Other Materials	3%



Project Benefits

- Reduce waste disposal
- Reduce greenhouse gas emissions by 70,000 to 85,000 tonnes per year
- Provide private sector opportunities

Alternative Fuel and Recyclables Concept Drawing





Thank you



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2018 Single Use Items Waste Composition

Karen Storry

SENIOR PROJECT ENGINEER

Zero Waste Committee, July 12, 2019

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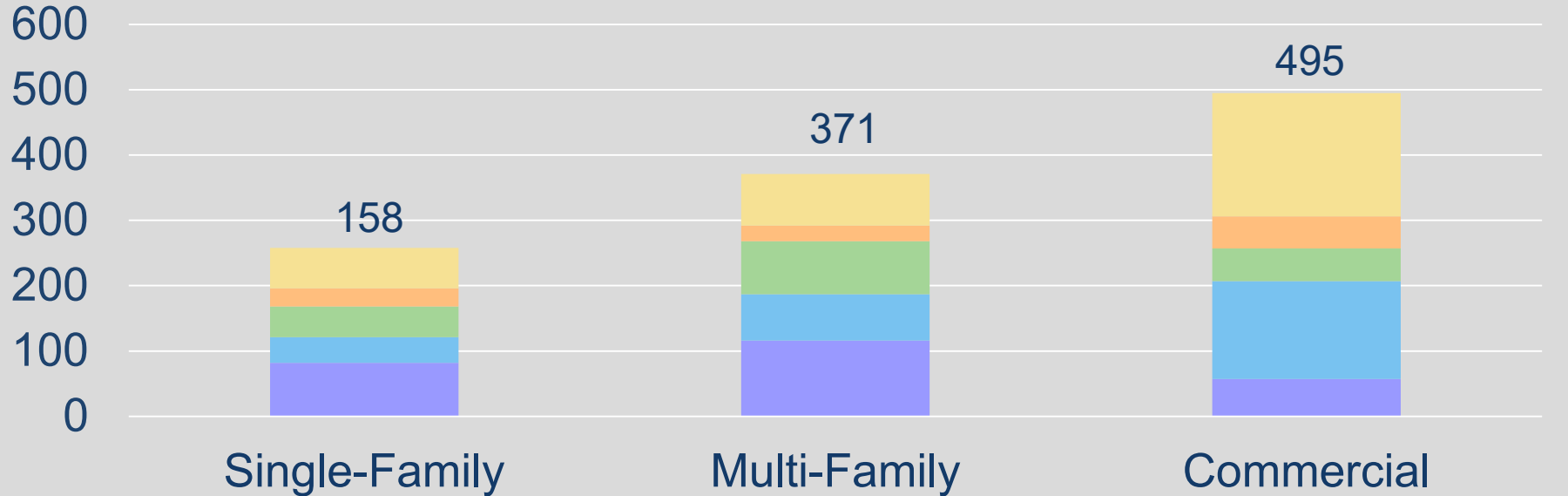
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Single-Use Items Disposed

Equivalent to 440 items
per person a year

Single-Use Item Disposal		
Single-Use Item Type	Items Disposed (millions)	% by weight of overall composition
Retail Bags	256	0.9%
Disposable Cups	262	0.6%
Takeout Containers	179	0.7%
Straws	102	<0.1%
Utensils	331	0.1%
Total	1.1 billion	2.4%

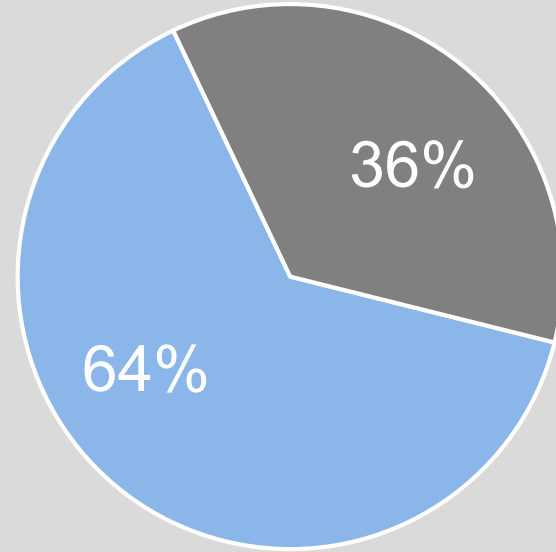
Total Single Use Items Disposed By Sector (Millions)



■ Retail Bags (Paper and Plastic) ■ Cups ■ Takeout Containers ■ Straws ■ Utensils

Plastic Retail Bags

202 Million
Plastic Retail Bags
Disposed



■ Re-used ■ Empty

Cups

262 Million Cups
Disposed

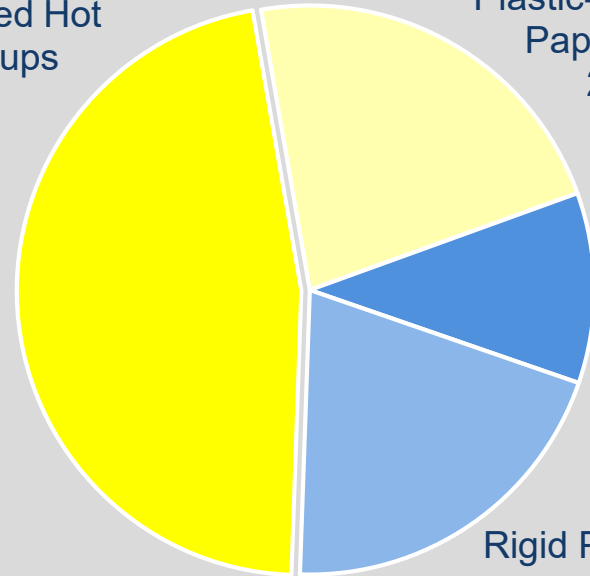


Plastic-Lined Hot
Paper Cups
47%

Plastic-Lined Cold
Paper Cups
22%

Foam Cups
11%

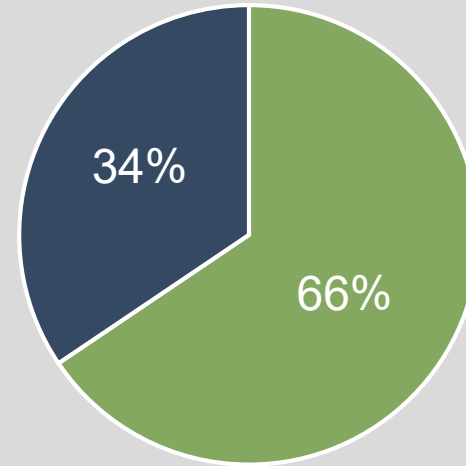
Rigid Plastic Cups
20%



Utensils



331 Million Utensils Disposed



■ Wood Utensils ■ Plastic Utensils



Thank You



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