Boston Zero Waste Planning

First Meeting- Zero Waste Advisory Committee
February 12, 2018
Boston Waste Management History

- **1980s**
  - Residents organize recycling drop-offs throughout city

- **1990s**
  - City launches curbside recycling collection (dual-stream)

- **2000s**
  - City introduces single-stream recycling

- **2010s**
  - City expands curbside leaf and yard waste collection, and launches food waste drop-offs
2014
Zero waste planning process included in City’s Climate Action Plan

2016
Zero Waste Municipal Leaders Summit

2017
Mayor forms Zero Waste Advisory Committee

2018
Zero Waste Plan recommendations complete
BOSTON ZERO WASTE GUIDING PRINCIPLES

1/ Make Zero Waste a Key Priority
- Define the Goal
- Expand Resources
- Develop a Strategy
- Work Collaboratively

2/ Focus First on Wasting Less, Diverting More
- Lead by Example
- Engage Large Generators of Waste
- Facilitate Residential Waste Reduction

3/ Support This Work Through Local Business
- Job training, innovation, research
- Worker safety and health

4/ Sustain This Work Through Culture Change
ROLE OF ZERO WASTE ADVISORY COMMITTEE (ZWAC) AND SUBCOMMITTEES

ZWAC SUBCOMMITTEES
- Review data
- Develop recommendations specific to residential, institutional, commercial and industrial (ICI) sectors

ZWAC
- Engage with community and networks.
- Develop ideas and final recommendations

RECOMMENDATIONS TO MAYOR
OVERVIEW OF TEAM, TASKS, TIMELINE
Team

Zero Waste Advisors:

Richard Anthony
Zero Waste Associates

Peter Engel
Kessler Consulting

Margaret (Maggie) Gainer
Gainer and Associates

Susan Hubbard and Alex Danovitch
Eureka Recycling

Jeffrey Morris
Sound Resource Management

Bob Gedert
Resource Recycling Systems
Tasks

Approach:

Task 1: Facilitate and organize meetings
  Objective: Obtain stakeholder input from City’s advisors and the public

Task 2: Gather and analyze data
  Objective: Identify opportunities for expansion or improvement

Task 3: Waste reduction and diversion opportunity assessment
  Objective: Identify opportunities for decreasing volume of discards from all sectors

Task 4: Cost-Benefit Analysis
  Objective: Analyze Plan milestones and identify funding options
Tasks

Approach, cont’d:

Task 5: Zero Waste Plan
  Objective: Develop a cutting edge, implementable Zero Waste Plan

Task 6: Market Development Study
  Objective: Understand and strengthen demand side of Zero Waste loop in Boston

Task 7: Public education case studies
  Objective: Document how leading cities successfully raised awareness
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<th>Task</th>
<th>Month 1</th>
<th>Month 2</th>
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INTRODUCTION TO ZERO WASTE
ZERO WASTE =

Reduce | Reuse | Recycle

Focus first on reducing and reusing, then recycle, compost, digest and redesign the rest.
ZERO WASTE IS A GOAL

Where all discarded materials are designed to become resources for others to use
ZERO WASTE WILL

Conserve & recover all resources
ZERO WASTE WILL

Not burn or bury them
ZERO WASTE WILL

Eliminate all discharges to land, water or air
INTERNATIONAL DEFINITION OF ZERO WASTE

No Burn, No Bury, No Toxic Emissions

http://zwia.org/standards/zw-definition/
Methane

Photo: NASA

21-72x

CO₂
Products & Packaging

37%

Figure 1: U.S. Greenhouse Gas Emissions: Systems-based view.

*(Provision of Goods: all consumer goods including building components and vehicles.)*
RECYCLING & COMPOSTING IN CA = ELIMINATING ALL CAR EXHAUST IN CA
## Zero Waste and Good Green Jobs

Recycling Industry =
Size of Auto Industry

<table>
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<th>10,000 tons of discarded material =</th>
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<tr>
<td>Burn or Bury: 1 job</td>
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<td>Composting: 4 jobs</td>
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<td>Recycling: 10 jobs</td>
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<tr>
<td>Reuse: 75 –250 jobs</td>
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Source: www.ilsr.org
ZERO WASTE MANAGEMENT

UPSTREAM

• Rethink
• Reduce
• Product Redesign
• Clean Production
• Product Stewardship
ZERO WASTE MANAGEMENT

DOWNSTREAM

- Reuse
- Recycle
- Compost/Digest
- Resource Recovery Parks
ZERO WASTE HIERARCHY OF HIGHEST & BEST USE

http://zwia.org/standards/zero-waste-hierarchy/
ZERO WASTE DRIVERS FOR COMMUNITIES
ZERO WASTE COMMUNITIES IN THE U.S.
If you’re not for Zero Waste, how much waste are you for?
MATERIALS GENERATION IN BOSTON

Generation = Disposal + Recycling
Recycling Rate = \frac{Recycling}{Generation}
RESIDENTIAL GENERATION IN BOSTON

Disposal = 189,809 Tons

Recycling = 50,474 Tons

Generation = 240,283 Tons

Source: Boston Public Works Department, FY 17 Actual Tonnages and Tip Fee by District
RESIDENTIAL GENERATION IN BOSTON

Disposal = 189,809 Tons
Recycling = 50,474 Tons

21% Recycling Rate

Source: Boston Public Works Department, FY 17 Actual Tonnages and Tip Fee by District
RESIDENTIAL DISPOSAL COMPOSITION BY MATERIAL CATEGORY

- Paper: 20%
- Plastic: 12%
- Metals: 3%
- Glass: 3%
- Organic Materials: 31%
- Construction and demolition: 12%
- Electronics: 2%
- Other Materials: 12%
- Household hazardous waste: 5%
- Glass: 3%
- Metals: 3%

Source: 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Havervill)
RESIDENTIAL DISPOSAL COMPOSITION BY RECOVERABILITY

- Recyclable: 38%
- Compostable: 34%
- Potentially Recyclable: 5%
- Problem Materials: 23%

Source: 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Havervill)
INDUSTRIAL COMMERCIAL INSTITUTIONAL GENERATION IN BOSTON

Disposal = 683,891 Tons

Recycling = 231,841 Tons

Generation = 915,732 Tons

Source: Mass DEP Solid Waste Data Update, includes MSW, C&D and Non-MSW disposal
2014 California Commercial Generator Waste Study based on Tons Per Employee Per Day
INDUSTRIAL COMMERCIAL INSTITUTIONAL GENERATION IN BOSTON

Disposal = 683,891 Tons

Recycling = 231,841 Tons

25% Recycling Rate

Source: Mass DEP Solid Waste Data Update, includes MSW, C&D and Non-MSW disposal
2014 California Commercial Generator Waste Study based on Tons Per Employee Per Day
COMMERCIAL DISPOSAL COMPOSITION BY MATERIAL CATEGORY

Paper 24%
Plastic 14%
Organic Materials 32%
Construction and demolition 17%
Household hazardous waste 2%
Electronics 1%
Other Materials 5%
Metals 4%
Glass 1%

Source: 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Havervill)
COMMERCIAL DISPOSAL COMPOSITION BY RECOVERABILITY

- Recyclable: 39%
- Compostable: 36%
- Potentially Recyclable: 6%
- Problem Materials: 18%

Source: 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Havervill)
## INDUSTRIAL COMMERCIAL INSTITUTIONAL GENERATION PROJECTIONS

<table>
<thead>
<tr>
<th>North American Industry Classification System Category</th>
<th>Tons Per Employee Per Year</th>
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<tbody>
<tr>
<td></td>
<td>Disposal</td>
<td>Recycling</td>
</tr>
<tr>
<td>Arts &amp; Entertainment</td>
<td>2.56</td>
<td>0.53</td>
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<tr>
<td>Wholesale &amp; Trucking</td>
<td>0.60</td>
<td>2.40</td>
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<tr>
<td>Education</td>
<td>0.43</td>
<td>0.08</td>
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<tr>
<td>Hotels &amp; Lodging</td>
<td>1.72</td>
<td>0.41</td>
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<tr>
<td>Manufacturing - Electronics</td>
<td>0.31</td>
<td>0.43</td>
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<td>Manufacturing - Food</td>
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<td>Manufacturing - All Other</td>
<td>0.45</td>
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<td>Medical &amp; Health</td>
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<tr>
<td>Public Administration</td>
<td>0.32</td>
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<tr>
<td>Restaurants</td>
<td>2.40</td>
<td>0.51</td>
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<tr>
<td>Retail - Food &amp; Beverage</td>
<td>1.21</td>
<td>5.43</td>
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<tr>
<td>Retail - All Other</td>
<td>2.14</td>
<td>0.27</td>
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<tr>
<td>Services - Management</td>
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<td>0.70</td>
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<tr>
<td>Services - Professional</td>
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<tr>
<td>Services - Repair &amp; Personal</td>
<td>0.94</td>
<td>0.57</td>
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<tr>
<td>Not Elsewhere Classified</td>
<td>0.50</td>
<td>0.70</td>
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Source: 2014 California Commercial Generator Waste Study
Disposal Projection: 2014 California Commercial Generator Waste Study based on Tons Per Employee Per Day – Scaled to Boston using Mass DEP Solid Waste Data Update, includes MSW, C&D and Non-MSW disposal.
BOSTON GROWTH PROJECTIONS

Projected Growth in Boston: Imagine Boston, page 21
Projected Growth in Boston: Imagine Boston, page 21
Residential Generation: Boston Public Works Department, FY 17 Actual Tonnages and Tip Fee by District
COMMUNITY AND STAKEHOLDER ENGAGEMENT

Variety of Approaches:

- Greenovate Blogs, webinars, events
- Surveys
- Interviews
- Community and Business Meetings
- Slide Show
- ZWAC Constituent Outreach
Next Steps

Us: Continued Research
You: Subcommittee Meeting, Outreach, Develop short-list of ideas
THANK YOU
MATERIALS GENERATION IN BOSTON
Materials Generation in Boston

Generation = Disposal + Diversion
Materials Generation in Boston

Diversion Rate = \frac{\text{Diversion}}{\text{Generation}}
Residential Generation in Boston

Disposal = 189,809 Tons

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Source: Boston Public Works Department, FY 17 Actual Tonnages and Tip Fee by District
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Diversion = 50,474 Tons

21% Diversion Rate

Source: Boston Public Works Department, FY 17 Actual Tonnages and Tip Fee by District
Residential Disposal Composition by Material Category

Source: 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Havervill)

FY 17 Disposal
189,809 Tons
Source: 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Havervill)
### North American Industry Classification System Category

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Disposal Projection: 2014 California Commercial Generator Waste Study
Commercial Employment Estimates and Disposal Projections

Projected FY 17 Disposal
754,104 Tons

Disposal Projection: 2014 California Commercial Generator Waste Study based on Tons Per Employee Per Day
Projected FY 17 Disposal
754,104 Tons
Projected FY 17 Disposal
754,104 Tons

Source: 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Haverville)

Disposal Projection: 2014 California Commercial Generator Waste Study based on Tons Per Employee Per Day
Boston Growth Projections

- **Population**
  - 2030: 8%
  - 2050: 10%

- **Jobs**
  - 2030: 9%
  - 2050: 30%
Projected Growth in Boston: Imagine Boston, page 21
Residential Generation: Boston Public Works Department, FY 17 Actual Tonnages and Tip Fee by District
Commercial Generation: 2014 California Commercial Generator Waste Study, Tons per Employee per Day, page 10