

OVERCOMING THE BARRIERS TO ZERO WASTE IN DURHAM RESTAURANTS

Prepared for:

National Restaurant Association

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April 22, 2013

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Laura Abshire
National Restaurant Association
1200 17th Street, NW
Washington, DC 20036

Re: Overcoming Barriers to Zero Waste in Durham Restaurants

Dear Ms. Abshire:

We are pleased to submit our consulting report to the National Restaurant Association. Thank you for the opportunity to work with you and Jeff. We have appreciated your guidance and support during this process.

Please extend our thanks to Michael Cheyne, Sharon Douglas, Lynn Dyer, Jim Hanna, Andrew Shakman, Jules Toraya, and Lorraine White for their eagerness to provide us with their time and expertise.

Sincerely,

Eden Ellis

Jihye Lee

Jake Reeder

Christine Yip

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EXECUTIVE SUMMARY¹

Policy Question (p. 2)

What policies and solutions can Durham implement and encourage to help restaurants overcome the chief barriers to achieving Zero Waste?

Overall Recommendation (p. 24)

The Durham² government should coordinate with private waste haulers and local entrepreneurs to provide affordable commercial composting to restaurants. At the same time, the National Restaurant Association (NRA) should develop toolkits and other informational materials to help restaurants separate their waste streams for composting and recycling. The NRA should also pressure restaurant parent companies to adopt sustainable waste management practices as well as recyclable and compostable packaging materials.

Background and Barriers (p. 6–13)

Durham is a mid-sized city with a population of 250,000 and a thriving restaurant community. The area's 500 restaurants run the gamut from small foodie havens to value-oriented family dining chains and limited-service restaurants. In May 2013, Southern Living Magazine rated Durham the "Tastiest Town in the South."

Full-service restaurants produce approximately 35 tons of food waste per year, and limited-service restaurants produce 13–20 tons per year. Durham does not offer commercial recycling or composting services to restaurants. The city only diverts 24 percent of its waste from landfills.

Packaging is another major component of the restaurant waste stream. Although some restaurants have tried to increase the recyclability or compostability of their packaging, these efforts are not environmentally beneficial if the packaging ends up in a landfill. In order to achieve Zero Waste in Durham's restaurant sector, both the packaging and food-waste streams must be diverted back into productive use through recycling or composting.

In the near future, Durham plans to provide commercial recycling collection at competitive prices to increase waste diversion. The city is interested in commercial

¹ *This student paper was prepared in 2013 in partial completion of the requirements for PPS 804, a course in the Masters of Public Policy Program at the Sanford School of Public Policy at Duke University. The research, analysis, and policy alternatives and recommendations contained in this paper are the work of the student team who authored the document, and do not represent the official or unofficial views of the Sanford School of Public Policy or of Duke University. Without the specific permission of its authors, this paper may not be used or cited for any purpose other than to inform the client organization about the subject matter. The authors relied in many instances on data provided to them by the client and related organizations and make no independent representations as to the accuracy of the data.*

² If not specified, Durham refers to the city of Durham rather than to Durham County or the combined city and county.

composting but lacks the staff capacity, expertise, or infrastructure to provide the service.

Durham has access to private-sector food waste composters. Local company Brooks Contractor in Goldston, North Carolina is the state's largest private-sector composter, and provides composting services for grocery stores, universities, and some restaurants across the region. However, the fees that Brooks charges are too high for almost all Durham restaurants.

Recommendations (p. 14–23)

Achieving Zero Waste in Durham restaurants will require providing an affordable commercial composting service to restaurants. Our first two recommendations address the market coordination failure that is preventing affordable composting in the city:

- **Recommendation 1 (Public/Private Partnership)** relies on local government to enroll local restaurants, creating a large customer base and lowering the costs of composting.
- **Recommendation 2 (Encourage Entrepreneurs)** proposes attracting private sector entrepreneurs to solve the coordination problem if the Durham city government does not step forward to solve the composting coordination problem.

Regardless of whether Durham decides to move forward with Recommendation 1, 2, or both, the NRA should take two immediate steps to support Zero Waste goals by lowering the barriers to adopting sustainable waste management practices:

- **Recommendation 3 (Lower Barriers)** details steps the NRA can take to lower the barriers to achieving Zero Waste in communities across the country, not just in Durham.
- **Recommendation 4 (Promote Sustainable Packaging)** addresses how the NRA can work with restaurants to increase the sustainability of packaging.

Table of Contents

EXECUTIVE SUMMARY	i
INTRODUCTION	1
SECTION I: CASE STUDIES	4
SECTION II: STAKEHOLDER OVERVIEW	6
Restaurants in Durham.....	6
Packaging	8
Durham City Government.....	10
Private Waste Haulers	12
SECTION III: RECOMMENDATIONS AND STAKEHOLDER ANALYSIS.....	14
Recommendation 1: Public/Private Partnership	15
Recommendation 2: Encourage Entrepreneurship	18
Recommendation 3: Lower Barriers	20
Recommendation 4: Promote Sustainable Packaging.....	22
SECTION IV: CONCLUSION	24
BIBLIOGRAPHY	25
APPENDIX I: INTERVIEW LIST	31

INTRODUCTION

The restaurant and food industry is a vital component of the American economy. In 2013, total restaurant sales are projected to be \$660.5 billion.³ For many Americans, relaxing and socializing at restaurants is an increasingly important part of their lifestyle.⁴ The centrality of the restaurant sector to the modern American life means that it contributes a substantial amount of waste to the United States' burgeoning landfills and trash dumps.

Restaurants produce many different kinds of waste; however organic (food) waste is the largest category by far.⁵ The United States generates 34 million tons⁶ of food waste annually but diverts just 3 percent⁷ of that total to composting facilities. Restaurants generate a large portion of that waste – about 35 tons annually per full-service restaurant and 13-20 tons annually per limited-service restaurant.⁸

This waste has vast economic, environmental and social implications. Each of the 250 million tons of trash that Americans produced in 2010 cost between \$85-\$250 to collect and \$40-\$100 to dispose of in a sanitary landfill.⁹ In a landfill, organic waste decomposes anaerobically and releases methane, a powerful greenhouse gas.¹⁰ Some communities are running out of landfill space, forcing local citizens to pay expensive tipping and transfer fees to haul waste to locations sometimes several hundred miles away. Composting food and other organic waste is critical to enable restaurants to achieve Zero Waste goals.

The second largest component of restaurant waste is packaging and paper products, including cardboard.¹¹ According to the Environmental Protection Agency (EPA), limited-service paper packaging is responsible for 4.1 million tons¹² of municipal solid waste annually. The economic and environmental costs of this waste are huge. Yet the negative impact of such waste on restaurant brand image is

³ *State of the Restaurant Industry. Restaurant Industry Forecast 2013.* National Restaurant Association, PDF. 4. "State of the Restaurant Industry."

⁴ State of the Restaurant Industry, 13.

⁵ "Targeted Statewide [California] Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups," Cascadia Consulting Group. California Integrated Waste Management Board. June 2006. 14. "Cascadia Report."

⁶ "Reducing Food Waste for Businesses." EPA. Environmental Protection Agency. Web. 30 Jan. 2013. "Reducing Food Waste."

⁷ Reducing Food Waste.

⁸ Cascadia Report 14.

⁹ Hoornweg, Daniel, and Perinaz Bhada-Tata. *What a Waste: A Global Review of Solid Waste Management.* Urban Development Ser. Knowledge Papers. No. 15. Washington, DC: World Bank, Mar. 2012. 46.

¹⁰ "Reducing Food Waste."

¹¹ Cascadia Report 14.

¹² U.S.A. Environmental Protection Agency. Office of Resource Conservation and Recovery. *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2010.* EPA, Dec. 2011. Web.

possibly even greater: how many burger wrappers littering the side of the road does it take to undo a brand's positive associations with sustainability? By reducing packaging waste and increasing packaging recyclability and compostability, restaurants can improve their bottom lines and increase brand value.

Recycling or composting restaurant waste has many other benefits apart from landfill diversion. Recycling reduces energy and material demands in new good production. Compost provides agronomical benefits to farmers, improving soil quality by increasing erosion resistance, water-holding capacity and gas exchange. These benefits raise the value of farmland, supporting local economies and helping to address the soil crisis.¹³

Governments and restaurants find themselves at a critical juncture to reduce waste. Growing awareness of the United States' waste problem and increased interest in sustainability are bolstering consumer support for recycling and composting. In cities around the world, governments are now working with restaurants, waste haulers and composting businesses to establish "Zero Waste Zones." These communities work together to change the disposal methods for consumed products to "divert the maximum amount of recyclable items and organic matter from landfills... back into the production cycle."¹⁴

For restaurants, participating in Zero Waste Zone schemes means putting food waste and recyclables back into productive use while increasing the sustainability of packaging. Accordingly, the question this report addresses is the following:

What policies and solutions can the Durham Community implement and encourage to help restaurants overcome the chief barriers to achieving Zero Waste?

The structure of the paper is as follows:

- Section I explains waste reduction case studies from around the country.
- Section II gives an overview of the stakeholders in the Durham restaurant waste stream and highlights the barriers to achieving Zero Waste.
- Section III provides our recommendations and stakeholder analysis.
- Section IV integrates our recommendations and provides an overall course of action.

Research Methodology

To answer the primary research question, we researched the three major actors in the Durham waste stream: the Durham city government, local restaurants, and private waste haulers. We conducted a literature review of successful waste reduction efforts, gleaned lessons learned and best practices. We also combined

¹³ Amlinger, Florian, and Et. Al. "Beneficial Effects of Compost Application on Fertility and Productivity of Soils." Federal Ministry of Agriculture and Forestry (Austria), 31 Mar. 2007. Web.

¹⁴ *Zero Waste Zones*. National Restaurant Association, Web. 4 Mar. 2013.

insights from interviews with waste experts, restaurateurs, city government officials, waste haulers, and composters. See Appendix 1 for a list of interview subjects and topics.

SECTION I: CASE STUDIES

Many cities have adopted Zero Waste programs and other waste reduction efforts. These programs typically combine collection services, environmental education, market incentives, and regulations to build partnerships aimed at increasing sustainable practices among residents and businesses.

San Francisco and Seattle are the greatest Zero Waste success stories, diverting approximately 77 percent and 54 percent of total waste each year, respectively.¹⁵

Although San Francisco is well known for its Zero Waste ordinances and regulations,¹⁶ the city's Zero Waste success relies on an innovative partnership with local waste-hauler Recology. This partnership integrates financial incentives and outreach efforts to ensure that recycling and composting services are affordable to local businesses.¹⁷ Seattle's Local Food Action Initiative has turned sustainable food practices and reducing food waste into a key part of the city's culture.¹⁸

We found local inspiration just west of Durham in Orange County. Between 1991 and 2011, Orange County reduced landfill waste 56 percent per capita, the highest rate in North Carolina.¹⁹ Orange County's geographic and demographic similarity to Durham County makes it an ideal local model from which Durham can adopt lessons.

Blair Pollock from Orange County Solid Waste Management said that coordination with the local restaurant association allowed the county to slowly expand composting programs across the entire food-service sector. To kick off countywide composting, Pollock explained that Orange County started with five drop-off sites and then expanded to curb-side and commercial services. The county levied a fee on all residential properties and used the surplus to fund restaurant recycling and composting.

¹⁵ Ferry, David. "The Urban Quest for "Zero" Waste." *The Wall Street Journal*. 11 Sept. 2011. Web.

¹⁶ The Urban Quest for "Zero" Waste.

¹⁷ Miller, Paige. "RE: Form submission from: Contact Us." Email to Christine Yip. 22 March 2013.

¹⁸ "Local Food Action Initiative." *Local Food Action Initiative*. Seattle City Council. Web. 14 Mar. 2013.

¹⁹ Pollock, Blair. *Reducing Waste in Orange County NC. What works (and doesn't work) in community recycling programs*. 20 Oct. 2011. PDF.

Figure 1: Program components of successful waste reduction efforts.

	San Francisco²⁰	Seattle^{21,22}	Orange County²³
Incentive Programs and Services	<ul style="list-style-type: none"> • Technical assistance tool kit • Recycling and composting set-up service • Audits and rebates • Lists of where to buy sustainable products and services • Promotional 'goodies' • San Francisco Green Business Program for one-stop information and promotions 	<ul style="list-style-type: none"> • Local Food Action Initiative to establish goals, policy framework and actions towards food sustainability • In 2013, pilot program to collect food waste in multi-family buildings • Seattle's Table, a food lifeline program to collect food from restaurants and deliver them to donation centers 	<ul style="list-style-type: none"> • Technical assistance • Food waste collection program and organic recycling program • 24 hour drop-off sites • Recycling pickup • Single stream collection
Partnerships	<ul style="list-style-type: none"> • Strong relationship with waste hauler Recology 	<ul style="list-style-type: none"> • Solid-waste contracts that have expanded recycling and compost services 	<ul style="list-style-type: none"> • Food waste partnership with Brooks Contracting • Coordination with local restaurant association
Regulations	<ul style="list-style-type: none"> • Disposable shopping bag fee • Mandated separation of recyclable, compostable, and landfill materials • Mandated provision of compostable or recyclable food service containers and utensils • Required manufacturers to collect and recycle their products at end of life 	<ul style="list-style-type: none"> • Disposable shopping bag fee • Required compostable or recyclable food service containers and utensils 	<ul style="list-style-type: none"> • Special fee to finance recycling and waste reduction effort

²⁰ Source: "Zero Waste." *Sfenvironment.org*. San Francisco Department of the Environment. Web. 11 Feb. 2013.

²¹ "Zero Waste Strategy." *Seattle City Council*. Web. 06 Feb. 2013.

²² Lerman, Sharon. *Food Action Plan*. Seattle: City of Seattle. Office of Sustainability and Environment, 2012.

²³ *Solid Waste Management Department*. Orange County North Carolina, 15 Feb. 2013. Web. 24 Feb. 2013.

SECTION II: STAKEHOLDER OVERVIEW

Restaurants in Durham

Overview

Durham's restaurant community is a microcosm of the country's broader food-service industry. The area's 500 restaurants run the gamut from small foodie havens to value-oriented family dining chains and limited-service restaurants. These restaurants are in a variety of settings from the redeveloping urban core with its narrow streets and alleys to modern suburban shopping malls and hotels.

The town's burgeoning restaurant sector has begun to attract national attention. In 2008, *Bon Appetit* magazine ranked Durham as the "Foodiest Small Town in America". The May 2013 issue of *Southern Living Magazine* declared Durham the "Tastiest Town in the South."

The diversity of restaurants makes Durham an ideal test case for increasing the sustainability of restaurant food practices. Success in Durham can serve as an emerging model for similar cities all across the country.

Recycling

Durham's restaurants recycle on an ad hoc basis. Durham City's recycling mandate requires all businesses and individuals to recycle newspaper, aluminum and steel cans, glass bottles and jars, plastic bottles, and corrugated cardboard. Despite poor enforcement of the mandate, most Durham restaurants contract for recycling services. Some restaurants have "single stream" recycling while others must sort materials or only recycle cardboard.

Composting

Composting is rare in Durham restaurants. Some restaurants maintain small initiatives such as offering customers used coffee grounds for home composting. Others have developed local networks of farmers who pick up organic waste for use as animal feed.

Barriers to Increased Waste Diversion

Achieving Zero Waste in the restaurant sector will require restaurants to overcome the multiple barriers to adopting comprehensive composting and recycling services. As in restaurants nationwide, cost drives decision-making in Durham. According to the National Restaurant Association's 2010 Operations Report, restaurateurs make between 1.8 percent (in fine dining restaurants) and 5.9 percent (in fast food restaurants) on their sales volume in income each year.²⁴ Almost one-third of

²⁴ National Restaurant Association. *2010 Operations Report*, National Restaurant Association and Deloitte. 18 May. 2010. "NRA 2010 Operations Report."

restaurants with average check size under \$15 operate at a loss.²⁵ Cost represents the biggest barrier to the adoption of composting and recycling programs.

In interviews with restaurateurs, we found that other barriers include the following:

- **Time:** Adopting recycling and composting programs requires initial staff training, sorting materials, and arranging composting pick-up.
- **Space:** Restaurateurs expressed concerns that their kitchens had limited space for additional recycling/composting receptacles. Lack of space for additional dumpsters is also a concern.
- **Corporate permission:** In franchise and chain restaurants, managers mentioned they would need permission from corporate offices in order to implement front-of-house or back-of-house waste practices.
- **Lease agreements:** In some leases, responsibility for setting up waste services falls on the owner of a property rather than the current occupant. Some restaurants that rent property from landlords are not able to renegotiate these leases to include composting or recycling services.
- **Health Regulations:** One restaurant mentioned it was concerned about health codes in setting up composting. This shouldn't be a factor as long as the restaurants are not composting on site.

²⁵ NRA 2010 Operations Report.

Packaging

Overview

Restaurants base their packing decisions on cost considerations, branding opportunities, customer experience, convenience, sanitation needs, and sustainability. Both full and limited-service restaurants use packaging in the front of house although it is more prevalent in limited-service restaurants. Single-use packaging saves both cost and time by eliminating or reducing 1) the need for dishwashers and other costly equipment, 2) water and energy use, and 3) labor and space to manage washing, drying and storing of reusable service-ware.

Large chains and franchisors have recently focused on sustainability in packaging. Applebee's replaced 95 percent of all Styrofoam packaging with recyclable packaging.²⁶ Starbucks and Pret A Manger have worked with the Coalition for Resource Recovery to test the recyclability of their cups and sandwich packages.²⁷ In order to achieve Zero Waste goals, Durham restaurants should use packaging materials that are reusable, recyclable, or compostable.

Barriers to Increasing Sustainability

Just as with adopting composting and recycling services, cost is the primary barrier to adopting Zero Waste-compatible packaging. Increasing packaging sustainability has cost restaurants between 3 percent and 300 percent of original packaging costs. Interviews revealed the following additional barriers:

- **Availability of composting services:** If compostable or recyclable packaging ends up in a landfill, it has no environmental benefits.
- **Consumer knowledge:** Consumers dispose of most food service packaging at home or at work. Increasing consumer knowledge about how to recycle or compost packaging materials will enable consumers to make smarter and more sustainable choices, thus reducing the amount of packaging that heads to a landfill.
- **Recycler knowledge:** Many recyclers believe that soiled paper products cannot be recycled.²⁸ Recent research by Global Green, in partnership with Starbucks and Pret A Manger demonstrated that

²⁶ "Applebee's." *Neighborhood Responsibility*. Applebees.com, Web.

²⁷ Kelly, Lily, and Joel Kendrick. "Evaluating Repulpability and Recyclability of a Blend of Post-Consumer Quick-Service Paper Packaging Material with Specified Fiber Grades at Readily Available Mill Types Utilizing Newly Developed Standards." Lecture. TAPPI PEERS Conference. 15 Oct. 2012. Web.

²⁸ "CoRR's Role in Expanding Resource Recovery in New York City." CoRR. Nov. 2011.

contaminated materials passed all recyclability performance criteria.²⁹

- **Franchisee autonomy:** Interviews with the managers of chain and franchise restaurants indicate that packaging decisions are made at corporate headquarters rather than at the local level.

²⁹ Kelly, Lily, and Joel Kendrick. "Evaluating Repulpability and Recyclability of a Blend of Post-Consumer Quick-Service Paper Packaging Material with Specified Fiber Grades at Readily Available Mill Types Utilizing Newly Developed Standards." Lecture. TAPPI PEERS Conference. 15 Oct. 2012. Web.

Durham City Government

Overview

Durham is a moderately sized city with a population of approximately 250,000.³⁰ The city anchors the Research Triangle, a business district flush with technology companies, major universities, and diverse restaurants. The City of Durham's solid waste transfer station manages approximately 170,000 tons annually,³¹ 56 percent of which comes from the commercial sector. In total, the commercial and industrial sector generates 16,000 tons of food waste.^{32,33}

The Durham City government provides basic solid waste management services including.³⁴

- Residential curbside landfill waste and single-stream recycling collection.
- Drop-off recycling and other material collection sites.
- Educational efforts.

The city currently diverts 24 percent of its waste into recycling streams.³⁵ It mandates that all businesses and residents recycle certain targeted materials³⁶ (although this ordinance is poorly enforced, with only three enforcement officials).³⁷ Property owners are responsible for providing landfill waste and recycling space to tenants.³⁸ The city does not currently offer any food waste composting collection; however, Durham does encourage residents and businesses to compost on-site by offering basic information on the city website.³⁹

Notwithstanding a few exceptions in the downtown core, the city government does not currently collect landfill waste and recycling from commercial businesses.⁴⁰ It does help businesses develop recycling plans (including conducting waste audits and onsite visits), along with general waste management education and training.

³⁰ "Durham (city) QuickFacts from the US Census Bureau." *State & County Quick Facts: US Census Bureau*. U.S. Department of Commerce. Web. 14 Mar. 2013.

³¹ Long, Donald. Department of Solid Waste Management. *City of Durham, North Carolina 10-Year Comprehensive Solid Waste Management Plan Update*. Durham: Department of Solid Waste Management, 2009. ES-2. "Durham 10-Year Plan."

³² This statistic refers to both Durham City and Durham County combined.

³³ N.C. Department of Environment and Natural Resources. Division of Environmental Assistance and Outreach. *North Carolina 2012 Food Waste Generation Study*. By Rachel Leven. Raleigh: DEAO, 2012. 14.

³⁴ *Solid Waste Management Department*. City of Durham. Web. 30 Mar. 2013. "Solid Waste Management Department."

³⁵ Long, Donald. Telephone Interview. 18 Mar 2013. "Donald Long."

³⁶ Targeted materials include newspaper, aluminum and steel cans, glass bottles and jars, plastic bottles, and corrugated cardboard.

³⁷ Long, Donald and Larrisha McGill. Telephone Interview. 15 Feb 2013.

³⁸ Solid Waste Management Department.

³⁹ Solid Waste Management Department.

⁴⁰ Donald Long Interview.

According to Durham's Solid Waste Director, Donald Long,⁴¹ the city plans to compete with private companies over the next few years for commercial recycling services. The city recently won a bid to provide recycling services to the local post office, finding that the scale of city operations allowed them to provide a more competitive rate than the organization's previous hauler. Sonoco, Durham's recycling contractor, pays the city a per-ton fee such that recycling collection provides additional revenue for the city's waste management budget. Durham's plans to compete for more commercial business will enhance the affordability of commercial recycling for restaurants in the future. However, achieving Zero Waste will require that Durham expand not just into recycling but also into commercial composting.

Barriers to Providing Composting Services

Durham faces multiple barriers to providing commercial composting services:

- **Budget:** Although waste reduction programs for businesses are in the Durham Solid Waste 10-Year Plan, Donald Long explained that limited funds have prevented action so far.⁴²
- **Staff expertise and capacity:** Durham's Solid Waste staff has not run commercial scale composting operations and lacks the experience and capacity to do so. Notably, the city had planned several training seminars for the building industry and a trade fair for the restaurant industry to encourage best waste management practices and packaging reduction. Ultimately, the city canceled these workshops, having decided that "limited staff expertise and time in this area [made the seminars] an unrealistic goal at the time."⁴³
- **Infrastructure:** The city does not have the infrastructure required to compost food waste and other organic matter.⁴⁴

⁴¹ Donald Long Interview.

⁴² Donald Long Interview.

⁴³ Durham 10-Year Plan.

⁴⁴ Donald Long Interview.

Private Waste Haulers

Overview

Waste and Recycling

Durham's private waste haulers include Waste Management, Waste Industries, and Republic Waste Management. Recyclers include Sonoco, Waste Management, J&D Recyclers, Shimar Recycling, Foss Recycling, and Clean Green Environmental Services. Sonoco is the local leader, collecting the majority of Durham's recyclable materials.

Composting

Unlike many cities, Durham has access to commercial-scale, comprehensive, private-sector composting. Based in Goldston, NC, Brooks Contractor is North Carolina's largest private-sector compost collection and processing service provider. Built on a failing family farm, Brooks has grown to a 30-acre composting facility that services over 150 locations. In 2012, the company composted over 12,000 tons of commercial food residuals. Brooks provides pick-up services for restaurants, grocery stores, universities, and industrial facilities. The company's trucks weigh and clean bins, charging customers on a per-ton basis with a minimum fee of \$45 per stop. The company also collects revenue by selling its compost to farms, golf courses, and gardeners.

Despite Brooks' success, other firms looking to enter the composting business face significant barriers to entry. The start-up costs for land, collection trucks, and other required machinery are high meaning there are significant economies of scale. Nevertheless, small-scale entrepreneurial ventures are emerging. CompostNow, a Raleigh-based company, provides residential customers weekly organics collection services for \$25 per month. However, CompostNow contracts out their end composting to Brooks, and the company is not currently planning on offering services to restaurants.

Although there are no companies in Durham currently offering just compost collection services to restaurants, outside of Durham, entrepreneurs have developed several successful models. For example, EcoMovement Consulting and Hauling of Portsmouth, NH is a for-profit venture that provides restaurants with collection, bin cleaning, and staff-training services for their compost and recycling needs.

Barriers to Reducing Costs

Currently available composting services are too expensive for most restaurants. To achieve Zero Waste in Durham, composting providers will have to lower fees. Our discussions with Amy Brooks, President and Founder of Brooks Contractor, identified the following barriers to these cost reductions:

- **High fuel costs:** Gasoline is the largest driver of waste hauler costs.
- **Route distance:** Brooks Contractor's facility is located over an hour away from downtown Durham.
- **Insufficient customer base:** If trucks have to make individual trips to widely dispersed restaurants, marginal fuel and time costs increase.
- **High coordination costs:** While Durham restaurants collectively generate a large amount of food waste, individual restaurants produce insufficient quantities of waste to make pursuing their business worth Brooks' time.

SECTION III: RECOMMENDATIONS AND STAKEHOLDER ANALYSIS

Achieving Zero Waste in Durham restaurants requires affordable commercial composting services. The organic waste that restaurants are throwing away has value to farmers and composters. Private composting companies in the city have the collection and processing infrastructure to manage that waste, but aren't connecting those facilities with the restaurants at an affordable price. This failure indicates a market coordination problem, and our first two recommendations provide potential solutions:

- **Recommendation 1 (Public/Private Partnership)** relies on government action to connect composters and restaurateurs to the benefit of all involved stakeholders. This recommendation is explained on **page 14**.
- If the Durham government does not step forward, **Recommendation 2 (Encourage Entrepreneurs)** proposes attracting private sector entrepreneurs to solve the coordination problem. This recommendation is explained on **page 17**.

While either of these recommendations will allow Durham restaurants to achieve Zero Waste, the NRA can also take some additional actions to lower the barriers to achieving Zero Waste in Durham and communities across the country. **Recommendation 3 (Lower Barriers, page 19)** details these steps.

The final component of achieving Zero Waste is increasing the sustainability of restaurant packaging materials. While chain and franchise restaurant headquarters located outside of Durham make most packaging decisions, the NRA can still work to support sustainable packaging. **Recommendation 4 (Promote Sustainable Packaging, page 21)** suggests that the NRA work with national organizations and develop a tool to support individual restaurants.

Recommendation 1: Public/Private Partnership

The Durham government should negotiate public/private partnership with Brooks Contractor to help restaurants access and pay for an affordable composting service.

Details and Timeline for Implementation

We propose executing our core recommendation in four steps:

Figure 2: Public/Private Partnership Recommendation Implementation Schedule

Timeline	Year 1	Year 1-2	Year 1-2	Year 3-5
Action	Initial Public/Private Partnership Negotiations	Education and Outreach Campaign	Lower Costs through Route Design	Implementation

Step 1: Public/Private Partnership Negotiation

The Durham government should negotiate the broad outlines of a public/private partnership in which Brooks Contractor provides weekly organic material pickup services to Durham restaurants. According to Brooks, the cost for composting service would be approximately \$210 per month per restaurant. Our research suggests that composting will allow restaurants to reduce the frequency of their landfill waste pickups, saving restaurants approximately \$160 per month.⁴⁵ To ensure that restaurant costs don't increase, the government should initially subsidize Brooks Contractor to bring down the amount charged so that the average restaurant faces no net cost increase. The amount of this subsidy is estimated to be approximately \$50 per month per restaurant. Importantly, Step 3 will revisit this cost estimate.

Step 2: Education and Outreach Campaign

After the initial negotiations are complete, the Durham city government should organize a campaign to sign up restaurants for the composting service. The goal should be to educate restaurateurs in the Durham area about the ease of composting, correct any misunderstandings about conflicts between composting and health codes, and explain any potential costs. Durham can partner with the Environmental Research and Education Foundation, a local non-profit that supports sustainable waste efforts, to conduct the education and sign-up campaign.

⁴⁵ This figure assumes that, because of composting, a restaurant is able to reduce its landfill waste pickups from two per week to one per week. If a restaurant needs more frequent pickups of compostable waste than one per week, both costs and the amount of money it can save from reduced landfill pickups will be higher. Our research suggests that these figures will increase proportionally to each other and that the size of the net subsidy will still be manageable.

Step 3: Lower Costs Through Route Design

With information on the restaurants that have signed up for the composting service, the government can re-approach Brooks Contractor to reduce the monthly fee. The \$210 fee is an upper bound estimate based on the assumption that Brooks is making trips to restaurants sparsely scattered across the Durham area. Innovations in the following areas can lower this fee:

- **Better route design:** With an increased customer base and higher restaurant density, Brooks' trucks will be able to make more stops on a given route, allowing them to reduce per-restaurant fuel and time costs.
- **Partnership with Durham Solid Waste Management:** Brooks' facility is located over an hour away from downtown Durham whereas Durham's Solid Waste Management facility is within 15 minutes. Durham Solid Waste expressed interest in renting Brooks excess land at the current transfer station for a nominal fee. Shortening the long round trip to Brooks' existing facility will reduce fuel and time costs.
- **Restaurant partnerships:** Durham should support individual restaurants interested in joint compost collection to reduce costs. Our research indicated that some restaurants would enthusiastically embrace this idea while others think the coordination barriers are too high. Rather than trying to formally develop restaurant composting collectives, Durham should support restaurants partnering together to reduce costs on an as-desired basis.

If these steps can reduce Brooks Contractors' per-restaurant fee by 25 percent, the government will not need to subsidize the commercial composting service.

Step 4: Implementation

Once Durham and Brooks complete final negotiations, restaurant composting collection services can begin in Durham city.

Stakeholder Analysis of Recommendation 1:

Restaurants: For restaurants, Recommendation 1 will overcome the chief barriers to Zero Waste by addressing the cost and availability of services. If necessary, the government subsidy ensures that restaurants will not face higher waste management costs for using composting services. The education and outreach

campaign will ensure that restaurants know how to implement composting in a cost effective manner.

Durham Government: From the Durham government's perspective, Recommendation 1 provides the infrastructure, staff expertise and capacity necessary for the city to implement commercial composting in restaurants. Partnering with Brooks Contractor allows Durham to tap into Brooks' composting expertise and capacity. Durham will not need to build any additional infrastructure, as Brooks Contractor will be managing the composting process.

While Durham will have to fund the subsidy, the city's eventual savings from reducing its payments to landfills in other communities may ameliorate this cost. As more restaurants sign up, Durham will be able to negotiate lower minimum fees with Brooks to further reduce the required subsidy. Ultimately, this recommendation is politically feasible given Durham's active discussions to bring composting and a focus on commercial waste reduction to the city.⁴⁶ We considered recommending a modification of Durham's waste fee structure to increase tipping fees or switch to a pay-as-you-throw structure, yet these changes did not seem likely to achieve Zero Waste goals because the city does not provide business collection services. As Durham expands into commercial waste services, the city should consider modifying its fees to further reduce waste.

Private Waste Haulers: Recommendation 1 will help private waste haulers overcome barriers to reducing composting fees by providing a client base sufficiently large and dense to reduce fuel costs and save time. Partnering with the city's Solid Waste Management Department will allow Brooks to reduce travel time to their distant facility. By providing a single point for contract negotiations, Recommendation 1 also solves the high coordination costs for private waste haulers of signing up hundreds of individually small restaurants.

⁴⁶ Donald Long Interview.

Recommendation 2: Encourage Entrepreneurship

Competitive seed funding should be offered to encourage entrepreneurs to create businesses that either create composting supply chains for restaurants or facilitate linking restaurants into existing organic waste streams.

Four sources could provide seed funding to composting entrepreneurs, each with an independent interest in seeing composting thrive in Durham:

- **Local government:** Durham is becoming a hub for entrepreneurship in central North Carolina. By steering entrepreneurs towards composting, the government can accomplish both economic development and environmental goals.
- **National Restaurant Association:** The NRA can use Durham as a test case for private sector composting solutions.
- **Local foundations:** Several philanthropic foundations in the Durham area are interested in environmental sustainability. The Triangle Community Foundation has funds that are focused on sustainability.⁴⁷ The Environmental Research and Education Foundation provides grants to support solid waste research and education.⁴⁸
- **Local restaurants:** Many Durham restaurants are heavily focused on sustainability. While these restaurants may be hard to coordinate, some may be interested in banding together to contribute seed funding for a composting entrepreneur, especially if doing so allows them to reduce waste disposal costs.

These organizations could provide funding through public grants or start-up competitions coordinated with local universities. We recommend a three-step plan for getting a seed funding competition off the ground:

1. **Build an alliance:** The NRA should identify co-sponsors who are willing to provide incubation space, capital or one-on-one mentoring services to funding recipients. Next, the NRA should work with co-sponsors to find a target population (MBA students, local small-business owners, farmers, etc.) and market the competition.
2. **Review applications:** The NRA should conduct a two-stage application process to identify the grant winner. The first stage

⁴⁷ "Triangle Community Foundation | Building Communities Through Philanthropy," Triangle Community Foundation. Web. 21 Apr 2013.

⁴⁸ "Lighting a path to sustainable waste management practices," Environmental Education and Research Foundation. Web. 21 Apr 2013.

should be a short but rigorous application that asks applicants to identify their idea, motivation, risk analysis, and business plan.

3. **Select winner(s):** From the pool of applicants, the top 5 should make their pitches to a panel of investors who will select the winner.

Regardless of the funding mechanism selected, the NRA should provide free access to the ConServe membership services and database as an additional costless incentive to entrepreneurs.

Stakeholder Analysis of Recommendation 2:

Restaurants: Overcoming the restaurant cost barrier is implicit in Recommendation 2 since composting entrepreneurs will not succeed if they increase restaurant costs. Additionally, successful entrepreneurs will increase the availability of waste hauling services in Durham.

Government: The government has the option to offer as much or as little seed funding as it sees fit. So Recommendation 2 does not create significant financial burden. Entrepreneurship could eventually eliminate the need for public sector composting services, reducing demands on limited staff capacity.

Private Waste Haulers: Seed funding will help entrepreneurs overcome the high coordination and startup costs.

Recommendation 3: Lower Barriers

A. Composting Toolkit: Develop a “Composting Toolkit” that shows how composting can be implemented without significant expense or demand on staff time. The composting toolkit should contain:

1. Training curriculum: Provides information on sorting materials into bins to help staff members quickly learn how to compost and recycle common restaurant waste items.
2. Bin and dumpster information: Shows restaurant managers how other restaurants have successfully integrated composting into their operations with pictures to address space concerns.
3. Sample signage: Shows both customers and staff what materials can go in each bin.
4. Sample “Table Talk”: Communicates and advertise Zero Waste goals to customers if restaurateurs choose to do so.
5. Lease information: Educates restaurateurs on successful lease negotiation with landlords. Also contains sample lease language to make the negotiations as simple as possible.

B. Corporate Advocacy: Work with major franchisors and chain restaurants to incorporate flexible composting and recycling practices into formal operating agreements and manuals in locations where composting and recycling are available.

C. Green Restaurant Certification: Help the Durham city government develop a green restaurant incentive program. Durham would be responsible for all certification.

Stakeholder Analysis of Recommendation 3:

Restaurants: Recommendation 3 addresses several barriers including lease issues, space limitations, time required to train staff, time required to sort waste, perceived limited demand from customers, and corporate permission.

The Composting Toolkit will provide accessible information to address perceived barriers to composting. Comprehensive composting facilities can collect all paper or food waste products, including napkins, wax paper, and compostable packaging items.

Accordingly, the Composting Toolkit will reinforce the message that these items do not need sorting to restaurateurs and staff. The curriculum will reduce the training

time burden by reducing the demands on restaurant managers and by containing sample procedures that can be inserted into restaurant operating manuals.

To assist with lease negotiations, the toolkit will provide restaurateurs with sample lease language and a guide to conducting these negotiations with landlords. It will also provide visual examples for operators of how composting bins can be easily integrated into restaurants so operators can visualize how little space composting actually requires. Finally, the “Composting Toolkit” will contain “Table Talk” that restaurants can use to communicate with customers, and the “Green Restaurant” certification program will raise the profile of participating restaurants.

In addition, Recommendation 3 starts to address restaurant manager concerns about limited ability to implement composting or recycling services without permission from corporate headquarters. The NRA can use its relationships with these large corporations to pressure for flexible operating agreements which will allow individual restaurant managers to decide whether recycling and composting make sense in their location.

Government: Apart from recommending that local governments develop “Green Restaurant” certification programs, this recommendation does not affect the government. Other cities have relied on restaurant self-certification to develop these programs, reducing government staff and cost commitments.

Private Waste Haulers: This recommendation will help private waste haulers increase their client base by lowering the barriers to restaurant composting, allowing haulers to decrease fuel and time expenditures.

Recommendation 4: Promote Sustainable Packaging

A. Corporate Advocacy: Advocate for recyclable or compostable packaging with franchisors and chain restaurant headquarters.

B. Sustainable Packaging Cost Estimates: Develop a financial analysis toolkit to help full-service restaurants understand potential costs or savings associated with recyclable or compostable packaging.

C. Education Campaign: Coordinate an education campaign with Global Green to correct any misunderstandings about packaging. The campaign should target:

- Recyclers: Although research has demonstrated that food-soiled and wax-coated packaging can be included in standard recycling streams, most recyclers still refuse these materials.
- Restaurateurs: The NRA should develop and disseminate a flier that informs restaurants about Global Green’s research, letting restaurateurs know that their local recycling facilities may be able to recycle food-soiled and wax-coated packaging materials.
- Customers: The NRA should develop one-sheets and “Table Talk” fliers that member restaurants can use to educate customers on proper packaging disposal.

Stakeholder Analysis of Recommendation 4:

Recommendation 4A will increase the priority that food service corporations place on sustainable packaging. Because many packaging decisions are made outside of Durham, individual restaurants or cities have little ability to advocate for reusable, recyclable, or compostable packaging with franchisor or chain restaurant headquarters.⁴⁹ Corporate advocacy for sustainable packaging is a role that we think the NRA can most successfully play.

Recommendation 4B will help restaurants evaluate if adopting sustainable packaging will significantly affect costs. Because our cost estimates for compostable and recyclable packaging were wide ranging, we believe that the NRA is best positioned to obtain price information from packaging suppliers.

Recommendation 4C addresses the information barriers that prevent diversion of packaging materials from landfills. An education campaign aimed at recyclers,

⁴⁹ Recyclable packaging is preferable to compostable packaging since more areas have recycling infrastructure. All paper and cardboard packaging can be composted if necessary but recycling these materials preserves their value.

restaurants, and customers will close the knowledge gap, ensuring that recyclable and compostable packaging materials are returned to the production cycle.

SECTION IV: CONCLUSION

The high price of commercial composting is the biggest barrier to achieving Zero Waste in the Durham restaurant sector. The Public/Private Partnership designed in Recommendation 1 has the greatest likelihood of providing commercial composting to restaurants at an affordable price. The Durham government is most able to solve both sides of the market coordination problem—the government can sign up many restaurants by subsidizing composting costs. Having a large pool of restaurant customers will eventually allow commercial composters to reduce costs through increased efficiency in route design, reducing or perhaps even eliminating the government subsidy.

If the city government is unwilling to step forward, Recommendation 2 provides an alternative path towards Zero Waste. Recommendation 2 funnels the creative power of entrepreneurs toward developing a model for restaurant composting collection.

Although entrepreneurship has been successful in other cities, we believe that government action is more likely to reach restaurants than entrepreneurs. Thus, Recommendation 2 has higher risk than Recommendation 1. However, these two recommendations are not mutually exclusive. Pursuing both paths simultaneously allows the government to hedge its bets on the best method achieving Zero Waste.

Regardless of whether Durham decides to move forward with Recommendation 1, 2, or both, the NRA can immediately take steps to support Zero Waste goals. Recommendation 3 shows restaurateurs the most cost-effective and efficient ways to implement composting. This recommendation addresses many of the barriers to composting we heard in our interviews with restaurateurs. As commercial composting becomes available in areas around the country, swift NRA action on Recommendation 3 will allow restaurateurs to achieve Zero Waste goals.

At the same time, Recommendation 4 addresses how the NRA can work with restaurants to increase the sustainability of packaging. By helping all restaurants to switch to reusable, recyclable, or compostable packaging, Recommendation 4 ensures that restaurants are reducing the amount of waste sent to landfills.

These four recommendations will allow Durham's restaurants to overcome the barriers to achieving Zero Waste. Success in Durham can provide a model to the NRA as they seek to help restaurants across the country divert more of their waste back to productive use.

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APPENDIX I: INTERVIEW LIST

Name	Title	Organization	Topic of Interview
Anonymous	Manager	Applebee's	Local Applebee's' packaging and waste management practices
Anonymous	Manager	Chili's	Local Chili's' packaging and waste management practices
Anonymous	Manager	Cracker Barrel	Local Cracker Barrels' packaging and waste management practices
Anonymous	Manager	Bull City Burger and Brewery	Bull City Burger and Brewery's waste management practices
Anonymous	Manager	Beyu Caffe	Beyu Caffe's waste management practices
Anonymous	Manager	Pop's Trattoria	Pop's Trattoria's waste management practices
Anonymous	Manager	Respite Cafe	Respite's waste management Practices
Amy Brooks	CEO & Founder	Brooks Composting	Brooks Composting's operations as well as composting science
Dan Colegrove	Vice President of Government Affairs	DineEquity, Inc.	Applebee's cost benefit analysis from switching between plastic to recyclable packaging
Sharon Douglas	Sustainability Manager	Hartsfield-Jackson Atlanta International Airport	Atlanta Airport's efforts to reduce their waste production
Lynn Dyer	President	Foodservice Packaging Institute	Foodservice packaging
Jim Hanna	Director,	Starbucks	Starbuck's waste reduction corporate policies and

Name	Title	Organization	Topic of Interview
	Environmental Affairs		initiatives
Lily Kelly	Interim Director, New York Office & Coalition for Resource Recovery	Global Green	Recycling possibilities for foodservice packaging and consumer cups
Reginald Lewis	Manager	T.G.I. Fridays	Local Fridays' packaging and waste management practices
Donald Long	Director	Durham Solid Waste Management	Durham's waste reduction initiatives, policies and services
Chris Marriott	Solid Waste Disposal Manager	Durham Solid Waste Management	Durham's waste management services, current policies and future plans
Larrisha McGill	Waste Reduction Coordinator	Durham Solid Waste Management	Durham's waste reduction educational efforts
Brian Miles	Chair	Durham City-County Environmental Affairs Board	Durham's grassroots environmental efforts
Paige Miller	Communications Assistant	SF Environment	San Francisco's Zero Waste program, policies and outreach efforts
Blair Pollock	Solid Waste Planner	Orange County Solid Waste Management	Orange County government programs and lessons learned
Thomas Poole	Appointed Board Member	City of Durham Environmental Affairs Board	Durham's environmental efforts
Justin Senkbeil	CEO & Co-Founder	CompostNow	CompostNow's business model and future aspirations

Name	Title	Organization	Topic of Interview
Andrew Shakman	Co-Founder, President	LeanPath, Inc.	The importance of measuring the amount of food waste generated by restaurants
Bryan Staley	President	Environmental Research & Education Foundation	Barriers to Zero Waste and possible solutions
Jules Toraya	Zero Waste Manager	City of Atlanta	Managing Zero Waste efforts in Atlanta
Lorraine White	President and Founder	M-PASS Inc.	Complexities of composting in cities and barriers to cutting costs