

**Proposal for Independent Graduate Project**  
**Environmental Sciences and Policy Program**  
**Johns Hopkins University**

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Master's of Science Candidate, December 2011

The Green Future of Newark, NJ:

An Evaluation of New Waste Management Practices, Green Jobs and Air Quality

## Project Synopsis

The overall purpose of this study is to identify new opportunities for sustainable waste management practices related to energy recovery from waste, waste disposal, waste reduction, and waste recycling for the City of Newark, New Jersey. The study will measure the impacts of the new opportunities on Newark's local economy, specifically the city's green business<sup>1</sup> and green job<sup>2</sup> markets. Once implemented, these practices would address existing economic, social, and environmental conditions, and provide local level benefits including an increase in green employment for residents; increase in sustainable use of materials<sup>3</sup>; and a reduction in particulate-contaminated air. The benefits identified will act as a mechanism to improve the quality of life<sup>4</sup> for several of Newark's traditionally under-served communities.

Newark's current industrial sectors will be analyzed to identify their contributions to the city's local economy. Industry and environmental experts within Newark will be consulted to provide recommendations and insight on new opportunities for sustainable waste management practices. The industry and environmental experts will explore and review waste practices involving sustainable use of materials within the traditional waste hierarchy.<sup>5</sup> The study will measure the expected co-benefits of the recommended waste practices, which are green job creation and a reduction of contaminants in the city's air. Newark is a city that faces continual evolution; through these recommendations the city will acknowledge that it can be a sustainable, healthy, and economically competitive city.

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<sup>1</sup> Goldstein, Jerome (2003). "New Jobs, New Companies from Used Feedstocks."

<sup>2</sup> Green jobs are defined as well-paid, career-track jobs that contribute to preserving or enhancing environmental quality. Apollo Alliance (2009). *Imaging Newark's Green Future*.

<sup>3</sup> For this study, sustainable use of materials pertains to wood, metal, carpet, food waste, and automotive oil

<sup>4</sup> Quality of life includes environmental health, the satisfaction of relationships with others, and dignifying work. Baron S. et al. (2009) *Partnerships for Environmental and Occupational Justice: Contributions to Research, Capacity and public health*

<sup>5</sup> EPA's waste hierarchy, in order of most preferred, includes source reduction, recycling, reduction, treatment and disposal. Environmental Protection Agency.

Many cities are looking to the future and how they can operate efficiently as they face continuing population growth and an expanding urban area.<sup>6</sup> Because of these constraints, urban areas will be forced to implement sustainable practices in various sectors of their economies. The goal of this study is for it to serve as a guideline for cities across the U.S. to recognize how sustainable waste management practices can enhance their community's quality of life by increasing its green workforce and improving its air quality.

## **Background**

### *Demographics of Newark*

Newark is New Jersey's (NJ) largest city, with 277,140 residents.<sup>7</sup> The 2010 U.S. Census showed that Newark's population grew for the first time in three decades with a gain of 3,600 people since 2000. The 2010 census also found that Newark has the largest Hispanic population in NJ, at 93,746. The median household income is under \$27,000, less than half of the NJ median household income; and, in 1999, over 28% of Newark residents lived below the poverty level.<sup>8</sup> The population density is ten times greater than the NJ average. Because of intense population figures, the city faces environmental justice issues. Approximately five miles west of Manhattan, Newark is bordered by two major water bodies: the Passaic River and Newark Bay to the east. Newark is home the Port Newark/Elizabeth-Port Authority Marine Terminal, one of the largest container shipping ports in the United States. Seven major highways, including the Garden State Parkway, and New Jersey Turnpike, pass through Newark making it extremely vulnerable to particulate contamination from the transportation industry.

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<sup>6</sup> Bramley, L. & Ellwood, F. (2009). Delivering socio-economic benefits from municipal waste management contracts - a toolkit.

<sup>7</sup> U.S. Census Bureau

<sup>8</sup> Rutgers Center for Urban Environmental Sustainability

Newark is one of the oldest cities in the United States; in the late 1800s it was one of the top productive cities per capita in the U.S. with a very strong manufacturing sector<sup>9</sup> Today, like many other cities, it faces high unemployment, air hazards, stagnant crime rates, and racial divisions resulting in underserved communities. At the same time, the country as a whole has challenges that seem insurmountable; currently, these challenges include collapsing financial markets, rising unemployment, and energy and transportation systems in dire need of repair. These issues will all prove to be barriers and important considerations throughout all stages of the study.

*Mayor Cory A. Booker's Green Vision for the City*

Cory A. Booker is the Mayor of Newark, NJ; he took the oath of office on July 1, 2006. He was elected following a sweeping electoral victory and was re-elected to a second term on May 11, 2010. In March 2009, Mayor Cory A. Booker, Council Member-At-Large Donald M. Payne, Jr., and other Newark dignitaries swore in members of the City's first Environmental Commission. This effort launched Newark's first such body, with a mission to protect and promote Newark's natural resources and become the "greenest" city in New Jersey. The Commission makes recommendations, oversees environmental policies and practices, and advises the Mayor and Council on environmental issues. The Commission addresses environmental education, air pollution, brownfields, solid waste, environmental and public health and the conservation and protection of natural resources.

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<sup>9</sup> McGurty, Eileen (2003). *City Renaissance on a Garbage Heap: Newark, New Jersey, and Solid Waste Planning*.

### *Newark's Unemployment and New Business Opportunities*

As of June 2011, Essex County had the highest rate of unemployment in the State of New Jersey, at 11.4%<sup>10</sup>. In 2010, however, the average annual unemployment rate for the City of Newark was 15%, one of the lowest compared to other New Jersey municipalities.<sup>11</sup> The construction business is one of the largest business sectors in Newark<sup>12</sup> and the city is in the process of diversifying its business sector. The Ironbound Business Improvement District in Newark is a coalition of restaurants and retailers, and recently the coalition partnered with a Newark recycling organization, Greased Lightening to recycle used cooking oil.<sup>13</sup> Newark's business district includes over 570 businesses and 170 restaurants, providing hundreds of service and retail jobs to New Jersey residents.<sup>14</sup> Corporate businesses such as Verizon and Prudential are headquartered in Newark and Covanta, a waste-to-energy provider, has one of its largest facilities just outside downtown Newark. The impact of a possible Covanta expansion, the development of new green businesses, and the increased practices of sustainable materials management will allow Newark to achieve its goal of increasing its green workforce and becoming a green economically competitive city.

### *Newark's Air Quality*

Newark is a vibrant urban industrial and transportation hub in the region; these sectors are also responsible for a large amount of air quality issues in Newark. For 2010, CLRsearch reported Newark had three categories of air toxins that were above average when compared to

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<sup>10</sup> New Jersey State Department of Labor and Workforce Development

<sup>11</sup> New Jersey State Department of Labor and Workforce Development

<sup>12</sup> Pollution Indexes, Environmental Protection Agency data, as collected by CLRsearch

<sup>13</sup> Greased Lightening, <http://www.yourwasteourfuel.com/>

<sup>14</sup> Ironbound Business Improvement District

the overall air quality in the United States; these three categories were nitrogen dioxide, carbon monoxide, and the overall air pollution index.

## **Methodology**

MDB, Inc., will design and provide facilitation support to the City of Newark to conduct a day-long Sustainable Materials Management Workshop expected to take place in early November 2011. The Workshop will focus on an exploration of sustainable waste management opportunities and green business development related to the traditional waste hierarchy. The purpose of the workshop is to allow traditionally under-served communities in Newark, NJ leverage multiple sources of federal and private investment for sustainable development. Through consultation with Newark's Office of Sustainability, stakeholders who contribute to Newark's waste generation and who possess the best knowledge of Newark's waste management practices will be selected; this will include officials from the city government of Newark, the State of New Jersey, universities, hospitals, and business, research, and community-based organizations. These stakeholders will be in attendance at the workshop and will provide recommendations on sustainable waste management practices for future implementation for the City of Newark.

Interviews will be conducted with the selected stakeholders. The stakeholders will be asked a series of questions related to: the quantity of waste produced and waste recycled in Newark; the organization's role and types of methods used in managing Newark's waste; the ability for the organization to expand its role in managing Newark's waste, if advised to do so; the organization's current and projected economic impact on Newark's economy and the accompanying data to support the described impact; the organization's workforce and projected

job growth or decline, if applicable; knowledge of current sustainable materials management practices, related to the waste hierarchy, that are being used in Newark and recommendations for future practices; and, additional stakeholders to be contacted for the study who play a key role in managing Newark's waste.

Upon completion of the workshop, five green businesses will be evaluated. The study will highlight the businesses' current economic contributions to Newark, their likelihood for expansion, and their generation of green jobs as a result of the sustainable waste management recommendations. Covanta, Greased Lighting, Reliable Wood, SIMS Metal, and Bayshore Recycling are the five businesses which will be reviewed. Additional business sectors, such as: carpet, fiber, food waste, and motor-oil recycling will also be reviewed and their expected economic impact will be included in the study, if they are included in the stakeholder's recommendations, which is expected. The expected economic impact will be determined upon review of economic input-output analyses, and recycling tonnage reports, waste generation reports, and industry profit reports received by the City of Newark and the businesses being contacted for this study.

The economic input-output analyses reviewed for this study will be based on the model developed by economist Wassily Leontief. The model depicts inter-industry relations of an economy; it shows how the output of one industry is an input to another industry. The model will include output multipliers<sup>15</sup> and job multipliers<sup>16</sup> which will be used to calculate the effect on jobs, and outputs generated per dollar of spending on various types of goods and services, in this

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<sup>15</sup> Total overall increase in dollars of business output for all industries per dollar of additional final demand (purchases) of the given industry. Ming, Z.N. et. al (2000). Environmental input-output model and its analysis with a focus on the waste management sectors.

<sup>16</sup> Total overall increase in jobs for all industries per new job created in the given industry. Ming, Z.N. et. al (2000). Environmental input-output model and its analysis with a focus on the waste management sectors.

case related to waste, in the regional area. The information is calculated in the form of a matrix; a given input is typically enumerated in the column of an industry and its outputs are enumerated in its corresponding row. Each column of the input-output matrix reports the monetary value of an industry's inputs and each row represents the value of an industry's outputs. Models can be calibrated for specific counties or aggregations of counties, and the data will be calculated through a system developed by MIG, Inc., the IMPLAN model, or through the U.S. Bureau of Economic Analysis, the RIMS-II: Regional Input/Output Multiplier System.

Anticipated green job development will be outlined after thorough review of data from the: Bureau of Labor Statistics, Friends of the Earth, Blue Green Alliance, Apollo Alliance, Green-Collar Jobs in America's Cities Report, and Newark's Green Future Summit Report. Unemployment trends will be reviewed through the Bureau of Labor Statistics. Anticipated job growth from new waste diversion projects will also be analyzed based on past implementation in other U.S. cities, for example the City of Los Angeles and the state of North Carolina. .

Current air quality data will be evaluated through the National Air Quality Index and the Environmental Protection Agency databases. Additional air quality reports issued by Newark's Environmental Commission, the Ironbound Community Corporation, and the Green Newark Project will also be evaluated. Newark's geographic location and proximity to national highways and airports are factors that will be considered. Cities that have executed sustainable waste management practices, such as Montgomery County, MD, and have experienced a reduction in air particulates will also be analyzed and considered.

## **Timeline**

- a. 8/12 – 9/15
  - i. Review materials on current Newark businesses
  - ii. Review materials on current waste management practices
  - iii. Review EPA Air data and Newark sustainability reports on air quality
- b. 9/15-10/15
  - i. Conduct interviews with Newark stakeholders
  - ii. Identify the top recommended waste management practices
  - iii. Identify and calculate economic benefits
  - iv. Identify air quality benefits
- c. 10/15-11/16
  - i. Compose Results
- d. 11/16-12/1
  - i. Deliver draft report for review by advisor.
- e. 12/1-12/15
  - i. Complete final draft of report for submission to JHU.

## **Advisor**

Tim Fields

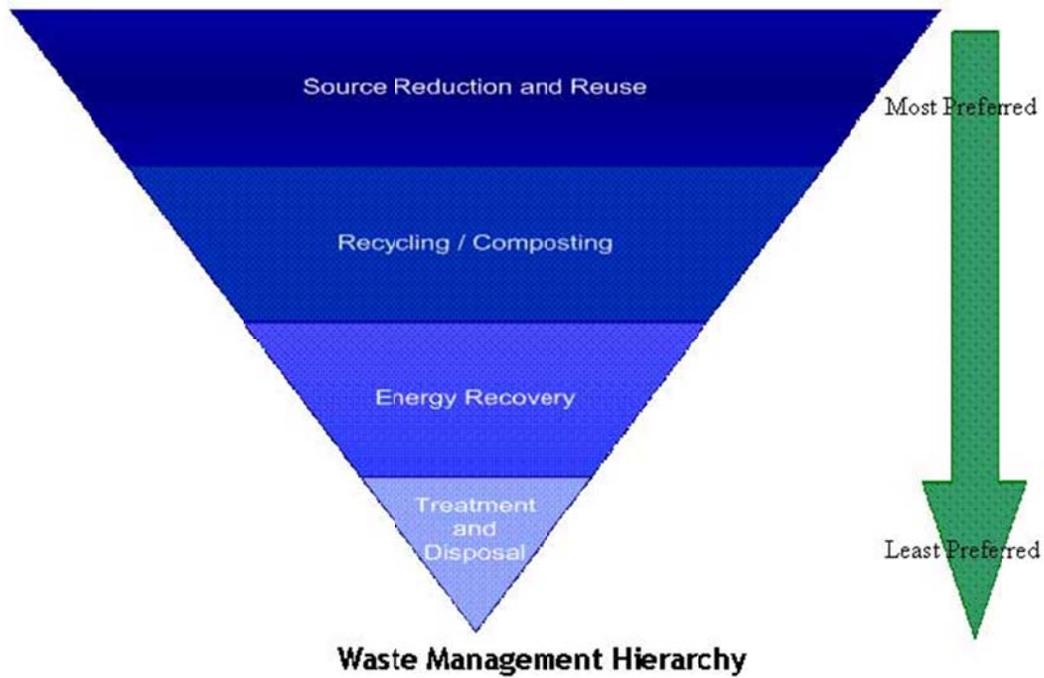
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## Appendix

### Waste Hierarchy Diagram



Covanta Map and/or Table

Newark Community GIS Maps

Port of Newark Map

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