Memorandum

To: Sybil Hammond/ Hallie Clemm (DCDPW)
From: ARCADIS Team
Subject: DCDPW's Strategic Roadmap
Date: January 28, 2014

Introduction

DCDPW is working with a team of consultants to develop a plan that does the following:

(1) Embraces the viewpoint that solid waste (more favorably called residual material) is an untapped asset rather than a burden to the District
(2) Critically reviews the current solid waste management operations in the District and their ability to meet the goals set forth by Mayor Vincent Gray's Sustainable DC Plan
(3) Develops a set of scenarios that use the available waste management technologies (i.e. recycling, land fills, etc.) in the most cost-effective and sustainable manner.

This plan is called the Strategic Roadmap. With the finalization of the Sustainable DC Plan and an opportunity to shift current operations, the team will complete and deliver a system evaluation with options for a new system model.

Executive Summary

The DCDPW team is currently developing a plan, the Strategic Roadmap, to analyze the current system and develop new models, which enable DC to meet its sustainability goals by 2032.

The Strategic Roadmap will:

- View solid waste management planning as an asset, source of capital and as a potential energy source, rather than a burden.

- Examine a range of scenarios (including a current-system baseline analysis), which evaluate the best use of our natural capital assets (i.e. air, land, and water resources) in handling residual material.
- Evaluate each scenario by its ability to help DC to meet its sustainability goals
- Consider a variety of existing and new technologies (i.e. recycling, composting, land fills, etc.) that are available commercially
- Apply best practices to each technology in each of the system components (i.e. generation, collection, diversion, disposition) of the model to inform and guide policy-making for DC officials.
- Reveal the true natural capital (air, land and water) costs associated with technologies and practices of handling residual material

Background Information

The current system handles almost one million tons of residual material that is collected by both DCDPW and private haulers each year. DCDPW has the opportunity to evaluate its current system's cost effectiveness and its ability to meet goals set forth within the Sustainable DC Plan.

2032 Goals by Sustainable DC

Sustainable DC has set forth a number of goals that are relevant to the development of the Strategic Roadmap. These goals are:

1. Achieve zero waste through reducing consumption and reuse
2. Increase green goods and services jobs 5 times over
3. Cut city-wide unemployment by 50%
4. Attract and retain 250,000 new and existing residents
5. Cut city-wide greenhouse gas emissions by 50%
6. Increase use of renewable energy to 50%

Barriers to Success in the Current System

Within the current system, many aspects may not be helping, in some cases actually impeding DC from reaching its sustainability goals. See the two examples below:

- DCDPW trucks currently consume over 600,000 gallons of fuel annually during the collection of residual material alone. In order to meet the Sustainable DC goal of cutting greenhouse gases by 50% by the year 2032, this number must be reduced and/or a cleaner fuel, green vehicles, and a more strategic approach to collections must be used.
- DC currently pays tipping fees and other costs associated with residual material management to other regional municipalities which supports their tax base and provides jobs to areas outside of DC. With the Sustainable DC goal of cutting unemployment and expanding opportunities for green-sector jobs, the use of new technologies that are based in DC should be a priority.

DPW Strategic Roadmap

The Strategic Roadmap is the plan that the DPW team is developing to evaluate the current system of solid waste management and provide options, which are cost effective and help to guide DC to reach its sustainability goals.

Turn a Negative into a Positive

"Trash" is the most common term for solid waste, which implies a negative connotation. It is currently viewed as a burden on our society, rather than a potential valuable commodity. Therefore the DCDPW team has developed a new set of terms to be used in discussing this work. For example:

Old Term	**New Term**
Solid waste	Residual material
Air, water, and land resources (used to process solid waste)	Natural capital assets
Solid waste management	Natural capital asset management

Elements of the Strategic Roadmap

System components: In the management of residual material, there are four system components that will be studied and used in the Natural Capital Asset Management (NCAM) model.

These components are:

Components	**Definition**
Generation:	materials discarded by DC residents, businesses, government agencies, as well as litter and other sediment found in DC streets and public spaces.
Collection:	pick-up, transportation, and delivery of residual material for further processing
Diversion:	sorting, separation, and transfer of materials to undergo further processes such as recycling, reuse, composting, refining (energy production), and other options
Disposition:	final disposal of discarded material with no further use intended

The NCAM Model

The Natural Capital Asset Management Model is a relational database tool that will be used to evaluate the measurable amounts of natural, physical, and financial capital assets that are used or may be used to manage residual material in reducing, reusing, and otherwise handling such material. The model is described below:

- First, the model identifies the capacity of the current system of natural capital assets. A system's capacity is defined as the amount of air, land, and water space or volume currently available within the boundaries of the study area (based on permits, leases, deeds and other access rights).
- The model then uses data from applicable technologies and practices and compares it to the system capacity, generating a set of numbers. For example, recycling uses "x" amount of air from emissions, "x" amount of acres for a plant, and "x" amount of water for the process. A best practice may be to establish bottle recycling at grocery stores, thereby eliminating "x" amount of glass and plastic bottles from the recycling stream. Therefore the amount of system capacity used is reduced.
- Through some analysis of the numbers, technologies and practices can be identified which enhance a system's capability to handle residual material while also using the lowest amount of capital assets.

In our case, a baseline analysis will be used to determine the current use of natural capital assets in the capacity of the DC system. From this baseline, scenarios will be run which depict increase or decreases in capacity as well as asset usage.

Scenario Development

Scenarios will be built which apply best and available practices to each of the technologies used in each of the system components. These scenarios will be developed through the use of research, interviews with experts, and workshops with stakeholders and the public. Each scenario will be input into the NCAM model matrix to evaluate the affects of each technology, its location, and any best practices applied against its use of DC's natural capital assets in the management of residual material. Scenarios will then be evaluated against the Sustainable DC goals, and its ability to enable DC to reach those goals.

A draft set of scenario models have been produced in the chart below and will be altered as necessary depending on feedback from the public and stakeholders through workshops. We hope to have workshop participants build their own scenario that will be run through the model as well.

Scenarios Matrix

Scenario/ Process Activity	**Phase 1 Load Production**	**Phase 2 Load Collection**	**Phase 3 Load Diversion**	**Phase 4 Load Disposition**
Baseline	Baseline	Baseline	Baseline	Baseline
Optimization A1	15% Source Reduction	TBD	80% Diversion through Recycling with DC Built and Natural Infrastructure	Landfill Minimization/Elimination
Optimization A2	15% Source Reduction	TBD	80% Diversion through Recycling with Regional Built and Natural Infrastructure	Landfill Minimization/Elimination
Optimization B1	15% Source Reduction	TBD	80% Diversion through Refining with DC Built and Natural Infrastructure	Landfill Minimization/Elimination
Optimization B2	15% Source Reduction	TBD	80% Diversion through Refining with Regional Built and Natural Infrastructure	Landfill Minimization/Elimination