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Case Study: Saving Money through Alternative Disposal of Street Sweeping Debris, Town of Natick, Massachusetts

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Case study:
Saving Money through Alternative Disposal of Street Sweeping Debris
Town of Natick, Massachusetts

Natick's estimated financial impact:

Start-up costs:	\$25,000
Annual costs:	\$8,000
Gross annual savings:	\$33,300
Net annual savings:	\$25,300
Payback period:	Within the first year

Description of Natick's experience:

Sand and organic materials from street sweeping and catch basins operations are regulated by the Massachusetts Department of Environmental Protection. The debris is considered a solid waste and under present regulations must be disposed of in a permitted landfill unless chemical tests support the reuse of the debris as landfill daily cover or support the reuse of the debris as material in a beneficial project. It can cost upwards of \$100 per ton for landfill disposal if the material fails to meet certain environmental standards. In a worst case situation, disposal can cost several hundred dollars if chemical test results show the debris exceeds a hazardous waste classification.

Debris not collected from sweeping streets often end up in catch basins, where they mix with oils and other chemicals found on roads and originating from vehicle use. In general, catch basin residues are much more expensive to dispose of than debris collected from street sweeping operations.

In 2004, Natick submitted a Beneficial Use Determination Application for a restricted use determination by the state Department of Environmental Protection (DEP) for a pilot project to demonstrate that debris collected from sweeping Town roads could be reused to the benefit of the Town. By doing this, the Town would avoid the associated high landfill disposal costs of the sweeping debris, as well as of the cost of disposing excess compost that the Town could now mix with the debris. The majority of the "sweeping debris" is sand the Town uses on its roads during the winter. This pilot tested soil samples collected from sweeping debris piles stored at the closed Town gravel pit to compare with draft standards in draft Beneficial Use Regulations. After meeting the draft regulation, the pilot project went on to show that the sweeping debris can be mixed with composted yard waste to make a soil additive that supports vegetation growth on the slopes of the closed gravel pit.

The pilot thus demonstrated that the Town can reuse two waste streams (sweeping debris and composted yard waste) for a beneficial purpose and avoid the associated costs for disposal of the two waste streams in a sustainable, environmentally-safe manner. Since then, Natick has continued this program and is presently asking the DEP for an unrestricted use determination for the reuse of the Town's sweeping debris.

Details of financial impact:

Natick has about 195 linear miles of road, which generates about 700 – 1,000 cubic yards of street sweepings annually.

The costs of disposing the sweeping debris in the traditional manner (landfill daily cover) are as follows:

700 – 1,000 cubic yards of sweepings = 910 to 1,300 tons (conversion 1 yard³ = 1.3 tons)

Cost of disposal = \$20/ton

Cost of transportation = \$10/ton

Annual cost of disposing excess compost = \$6,000

In sum, the lower end of total disposal costs would be $(910 \times 30) + 6,000 = \$33,300$ and the

higher end would be $(1,300 \times 30) + 6,000 = \$45,000$. **To be conservative, the lower bound of \$33,300 will be used for this analysis.**

The costs of the current program are as follows:

Initial preparation of the Beneficial Use Determination Application = \$25,000

Annual analytical costs for testing the material = \$7,000

Additionally, some staff time is required to mix the materials with soil to create the loam. For this analysis, it will be estimated that 40 hours are required at an hourly cost of \$25/hour (including benefits). This means the estimated staff cost would be \$1,000.

In sum, the total costs for the program include a one-time expenditure of \$25,000 and annual expenditures of about \$8,000.

So, making this change leads to a net savings of about \$25,300 annually after the first year, during which the one-time start-up expense reduces the net savings to \$300. This program pays for itself within the first year.

Unquantifiable effects:

Because the costs of dealing with street sweepings are now lower (and partially de-linked from the actual amount of sweepings collected), there is greater incentive to do more street sweeping. More sweeping can lower the amount of debris that go into the catch basins, which may in turn have additional financial and environmental effects (both positive and negative) that are more difficult to quantify.

Feasibility for other municipalities:

In order for a municipality to determine whether this program might be feasible, it is important to answer the following questions:

- How many cubic yards of sweepings does the municipality collect annually?
- How likely are the municipality's sweepings to meet the standards for use as a soil additive?
- Does the municipality have a use for extra soil additive?
- How much is the municipality currently paying for sweepings transportation and disposal fees?
- Can the municipality find the money to pay for the upfront cost of preparing the BUD application?