

# **Environmental Policy at its Most Fundamental: The Case of New York City's Solid Waste Crisis**

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## **1.0 Introduction**

The environmental problem has a great number of dimensions, all linked to the inescapable fact that human beings are biological entities, dependent on a limited range of specific substances for our survival. The earth's population continues to grow, a fact that is a source of stress on finite natural systems and resources. Yet, our ability to use information and technology to expand the planet's carrying capacity also continues to grow. Environmental problems cross the boundaries of sovereign states and in the case of global climate change effect natural systems that are world-wide in scope.

This case study is intended to be a brief exploration into a fundamental issue of environmental policy. It presents and applies a framework for a multidimensional analysis of an environmental issue. The case is fairly prosaic and common- disposal of a city's garbage. The problem is capable of a degree of technological remedy, but the presents political and financial challenges to New York City's government. For purposes of this analysis, environment is conceptualized as:

- An issue of values-- What type of ecology do we wish to live in?
- As a political issue--What type of political process can best maintain environmental quality?
- As an issue of technology and science--Can science and technology solve environmental problems as quickly as it creates them?
- As a policy design issue--What type of public policies are needed to reduce damaging environmental behaviors. How can corporate and private behavior be influenced?
- As a management issue--What type of administrative and organizational arrangements have proven most effective at protecting the environment?

After discussing these dimensions of environmental problems the paper then discusses the policy and management approaches typically used to "solve" environmental problems. The case study then attempts to apply this framework for analyzing environmental problems and solutions to New York City's solid waste problem. I will examine the city's garbage problem as an issue of values, as a political issue and as a problem for science and technology. I will then assess the degree to which New York City's solid waste issue can be seen as a policy and management

problem.

## **2.0 Values**

While the issue of environmental ethics is arguably the most important of the five issues I will raise, it is the one I will say the least about. There is little question that ideas about our relationship to the ecological environment derives from our concept of property and a definition of nature as a resource to be used for human material well being. The domination or taming of the environment has long been a theme in the development of western politics, economics, society and religion. In fact it is central to the definition of what we have termed civilization. Civilization involves the mastery of humans over the other species in the environment and the development of the surplus wealth and leisure time needed for thought, reflection and the transmission of learning. To the extent that we are successful, the natural environment is something that is available for our use: a set of resources to be consumed.

We have learned that we are more dependent on natural systems than we thought, and at the moment, we do not have the ability to supplant these resources and maintain the type of existence we would define as being of high quality. This pragmatic point is fairly compelling, but some environmental philosophers believe that our very arrogance is at the heart of the environmental problem. In this view, unless we redefine our relationship with the environment and stop looking at other species as resources, we will never address the root causes of our environmental problem. While this may be true, it is a little too late for the planet's six billion people to contemplate a return to nature. Moreover, other values we hope to achieve such as equity, justice, family and education, to name a few, preclude a radical redefinition of our relationship to the biosphere.

Given the gross worldwide disparity in wealth, it is difficult to halt economic development and its associated environmental impacts in place. Instead, some analysts hope that economic development will result in demographic transitions that reduce population growth and increase the public's stake in protecting the environment. The theory is that in developing nations children are perceived as essential for economic and old age survival. In developed nations children are "decorative" and an economic liability; therefore there is less of an economic incentive to bear children in developed nations. According to this theory, only economic development can bring population stability to the planet. The language of economic development in recent years has introduced the notion of sustainability, which is another way of saying development with sensitivity to environmental impacts. The hope is that a fully developed world with low population growth would prove less detrimental to environmental quality than the partially developed world we now live in.

The desire for economic development is an expression of values. A good life, as we now understand it, includes a high level of resource consumption. I do not think it is realistic to assume that this concept will change. Western patterns of consumption may disgust us in principle, but it is one that we all practice, to some degree, and its seductiveness and appeal is a demonstrated fact

of modern life. What then, is the goal of environmental politics and policy? I would argue that it is the one that has evolved over the last thirty years at the U.S. EPA.

In the beginning, the environment was an esthetic issue and an issue of lifestyle. It included a preference for the virtues of an agrarian and/or rural life way of life. Environmentalism has its roots in the anti-urbanism of late 19<sup>th</sup> century America. Cities were seen by some as corrupt and evil in contrast to green open spaces which could cleanse the soul and stimulate virtuous living. When EPA was created in 1970, it was primarily as an anti-air and water pollution agency. Nearly all of the staff in the newly created agency were moved in 1970 from the Department of Health, Education and Welfare's (HEW) air and water pollution control units. Dirty air and water were vaguely unhealthy, but decidedly unsightly. As EPA's mission expanded in the 1970's, it started to work on other issues, such as solid waste that resulted from urban environmental problems. With the passage of the toxic waste clean up Superfund program in 1980, the environmental issue began to be defined as a public health issue. Pollution was not just ugly, it could make you sick. In the 1980's this human health orientation continued. In the early 1990's, we again saw a shift as the focus turned to international environmental problems, especially global climate change. As holes in the ozone and global warming were uncovered, the environmental problem was defined to include a concern for the viability of the planet itself.

In each of these definitions of the agency's mission, the concern has been, and in my view will remain, one of human well-being. We protect the environment in order to make sure we don't kill the goose that hatches the golden eggs. Our taste for golden eggs, for economic consumption, continues to grow. The environmental ethic we operate under requires us to maintain the biosphere for our descendants, not because we care about them, but because environmental deterioration reduces our ability to consume things we desire--such as wholesome, tasty food, fresh air, clean water and coastal cities that are not submerged due to global warming.

Some have argued that the environmental problem requires a change in the dominant social and political paradigm and a fundamental change in how we view each other, politics and the environment. Such dramatic change does not strike me as either necessary or feasible. Instead, environmental policy has focused and will continue to focus on developing methods for fulfilling the environmentalism that is part of our current consumer ethic. This environmental ethic is caused by society's need to maintain the environment to live what our value system defines as a high quality of life. Today's environmentalism results in changed consumption patterns, not a reduction of consumption. This may involve changes in behavior to consumption that uses fewer resources, such as surfing the net for entertainment instead of cruising the local hamburger stand in a gas guzzling auto. But it does not mean a reduction in economic consumption. It certainly had not resulted in a reduction in this nation's waste stream. As I will discuss later, total production of solid waste in the United States has grown from 2.7 pounds per person per day in 1960 to 4.5 pounds per person per day in the year 2000. (<http://www.epa.gov/epaoswer/non-hw/muncpl/facts.htm>). But during that same period of time recycling grew from 5.6 million tons per year, or less than 10% of total wastes, to approximately 70 million tons per year, or 30% of the waste stream in 2000. This is additional evidence of the changed nature of consumption

patterns, while consumption continued to increase.

In sum, the environmental ethic that has had the greatest impact in the three decades has been a form of enlightened self interest. In this value system environmental protection is not traded off against the value of economic consumption, it is a form of consumption and does not signify a break in the culture of consumption.

### **3.0 Environmental Politics**

Although the environment as a political issue has not resulted in a major shift in the dominant social and political paradigm, it has added a significant new set of considerations to the policy process. The environmental issue has made significant demands on our political processes and institutions. A political process has been required to develop a consensus about the definition of environmental quality and make decisions about methods for achieving environmental goals. In the past thirty years, this political process has facilitated a high degree of social learning in the U.S., a tendency that will need to continue because technical information on human-induced change and ecological conditions must continue to be summarized, disseminated and understood by decision makers and the broad public. The issue of environmental politics is closely connected to the issue of economic development and world wide income distribution. Environmental policy is about individual and collective patterns of resource deployment, consumption and degradation. Put simply, we must learn enough about the biosphere to make sure that in our use of it we do not irreversibly degrade or destroy it. Once we know the type of behaviors required to sustain the environment, we must organize ourselves to perform those behaviors.

This learning process creates winners and losers. The assignment and distribution of benefits and costs creates political conflict that both impedes and distorts social learning. People and interest groups sometimes present environmental information that is partial or misleading to serve their own particular interests. Therefore, environmental policy never appears as a seamless progression from scientific discovery to implemented public policy. Rather it looks like a meandering series of disjointed incremental steps, looking very much like the type of policy making described by David Braybrooke and Charles Lindblom in A Strategy of Decision. The decision making strategy they described is “remedial”, “serial”, and “exploratory”. Policymakers move away from problems rather than toward solutions. Braybrooke and Lindblom observe that “analysis and evaluation are socially fragmented, that is they take place at a very large number of points in a society. Analysis of any given problem area and of possible policies for solving the problem are often conducted in a large number of centers.” (P. 104)

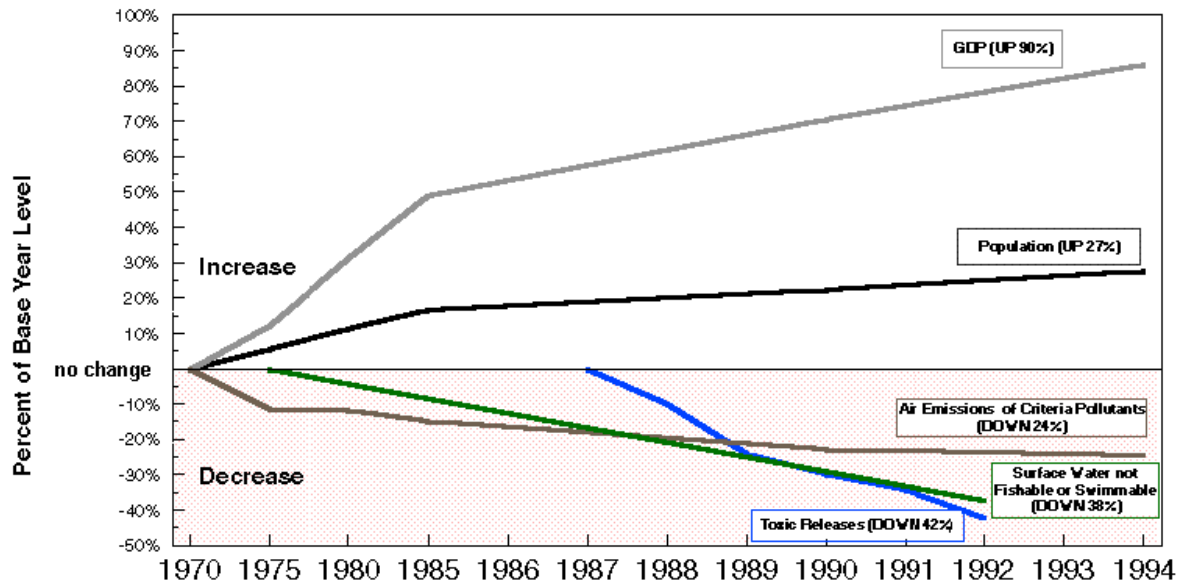
Many environmental scientists and advocates lament the messiness of this type of policy process and believe it is inadequate to the task of addressing long term, interconnected, large scale problems such as protecting the environment. In this view, partial answers cannot address the root causes of environmental problems. Nevertheless, what are our alternatives? Slow down the input of information and get back to the land? I don't think so. Eliminate pluralistic, interest-dominated politics? I doubt that totalitarianism is a viable alternative form of politics. Mass

participatory democracy seems equally unlikely. In my view, even if we were able to achieve a perfect understanding of the environment and the effect of human interaction upon it, our social and political processes cannot absorb and act on the volume and complexity of that information. The exception would be a genuine crisis. Normal politics and incremental policy making can be suspended for a time during a crisis. In the United States during World War II, nearly 50% of the GNP was spent by the government and certain civil liberties were suspended. In the weeks after the World Trade Center was destroyed, partisan politics was replaced by an unusual degree of national unity and patriotism. However, crisis management and politics and war-time mobilization cannot be sustained indefinitely. Eventually, normal incremental politics resumes. Unfortunately, the difficulty with the environmental problem is that if we get to the crisis point, it may be too late to solve the problem.

The answer, to the extent there is an answer, is to organize politics in such a way that the learning and decision making process is accelerated. Environmental issues must be raised and discussed through the electronic media, public education programs and active efforts to elicit citizen participation in policy making. I would argue that the amount of environmental education that takes place worldwide has grown exponentially since 1970. In developed countries, young people are raised to understand facts about the biosphere that were unknown when today's Baby Boomers were growing up. On the other hand fear of environmental damage has resulted in the reflexive "not-in my backyard syndrome" that sometimes resulted in greater total environmental impacts in order to avoid lesser impacts to a more powerful or better organized local constituency.

In the United States one result of increased levels of environmental concern and literacy has been a series of successful efforts to protect the environment. As the EPA data indicates (U.S. EPA: 1998) pollution in the United States has decreased dramatically while population and GDP growth have continued. The irrational, non-analytic decision making and political process in the U.S. has brought about a successful reduction in key pollutants. This does not mean that the environmental problem is solved, or has gone away, but rather that we are "moving away from the problem". In the area of solid waste, per capita consumption of solid waste grew from 2.7 pounds per person in 1960 to a peak of 4.6 pounds in 1999, but fell to 4.5 pounds per person in 2000. While we cannot state it definitively, we believe that the problems of environmental degradation and solid waste management in the United States are slightly less severe in 2002 than in 1992. How did we make this progress? What type of political process did the U.S. engage in? The environment, over time, achieved status on the political agenda. The definition of environmental politics has changed, but it has resisted a number of concerted attacks on its legitimacy, and appears to be a permanent fixture on the political agenda. The environment reached the national arena in the U.S. in several stages. Rachel Carson's, Silent Spring (1962) and Barry Commoner's, The Closing Circle (1972) were published and began to popularize the concept of a global ecosphere that human economic activity such as the application of pesticides and nuclear testing were threatening. After the 1968 Presidential elections, the environment began to enter the political agenda in Washington D.C.

## *Environmental Improvements/Economic and Population Growth*



Source: U.S. EPA: *Twenty-Five Years of Environmental Progress at A Glance* (EPA Web Site: Washington D.C. 1998)

During the 1968 campaign, Maine Senator Edmund Muskie carried himself so well as a Vice Presidential candidate that he was immediately considered a front-runner for the 1972 Presidential nomination of the Democratic party. Muskie's major issue was protecting the environment, and in 1969 and 1970 he pushed for the enactment of an air pollution control act that would set national standards for ambient air quality. (Jones: 1974) While this was initially opposed by industry, President Nixon came to support a national air quality bill as a way of countering Muskie's growing political strength. He, and others also saw the environment as a safe, less contentious issue than the war in Vietnam. Some political analysts at the time viewed Nixon's support of the environment as a way to distract people from the war and the slow process of turning its conduct over to the South Vietnamese Army.

The U.S. EPA was established at this time, not through an act of Congress, but through Executive Order. This coupled with the enactment of the National Environmental Policy Act (NEPA), provided President Nixon with an environmental record to counter Senator Muskie's in preparation for the 1972 campaign. In the end, Muskie failed as a Presidential candidate, and with a weak challenge from George McGovern in 1972, Nixon felt confident enough to veto the Federal Water Pollution Control Act, which was subsequently enacted *over* his veto. Despite Nixon's action on the water bill, in the 1970's the environment

was typically seen as a fool-proof, popular political issue. With the exception of the early years of the presidency of Ronald Reagan, environmental protection has always been seen as a simple issue for politicians--No politico could afford to be perceived as anti-environmental.

In the late 1970's and early 1980's conservative Republicans from the western part of the U.S. developed an anti-environmental ideology and, in exchange for their support of Ronald Reagan's Presidential campaign were given the Department of Interior (James Watt) and EPA (Ann Gorsuch, later Burford) to manage. To Reagan's White House team these were relatively unimportant ministries, and so they did not pay a great deal of attention to selecting the Secretary of Interior or the Administrator of EPA. The appointments were used to repay political debts. Moreover, Reagan's senior advisors assumed that popular support for the environment was diminishing. The environment was no longer appearing on the "top ten list" of issues cited by the American public as "important" in public opinion polling. Environmental interest groups recognized the threat to the gains of the 1970's and organized a campaign of opposition that culminated in the resignation of Burford and her replacement by the first Administrator of EPA, Mr. Green himself, William Ruckelshaus.

It turned out that the Republican political leadership had misread the polling data. The environment had become a less pressing issue, because the average American thought that reasonable progress was being made to clean up pollution. When it became clear that the leaders of EPA and Interior were attacking some of the programs that had brought those gains, the environment's importance rating in national polls grew to levels as high or higher than in the early 1970's. Recognizing that they had landed on the wrong side of this issue, and with the 1984 presidential election approaching, the Reagan Administration moderated its views, forced out some of the most visible right-wing environmental leaders, and allowed incremental environmental progress to resume. In all likelihood, President George W. Bush will learn this lesson by the 2004 national election. As of early 2002, the American public was not sure where Bush stood on environmental issues. He has not yet been defined in the public mind as anti-environment. His EPA Administrator, former New Jersey Governor, Christy Todd Whitman, is a moderate with a reasonable environmental record. This is an indication that the lessons of the mid-1980's have not been lost on the current President and his political team.

The basis for the environment's political strength has been popular support for protecting environmental quality. The importance of environmental protection has been the subject of massive educational and propaganda efforts by scientists, advocates, the media and professional educators. While respect for property rights remains strong in the American political culture, especially in the Western states, support for environmental protection frequently dominates concern for property rights. This did not happen overnight and is arguably a result of the high level of economic wealth in the U.S. This wealth permits consumption of beach homes, country homes, suburban living and vacations in national parks and rural areas would be diminished by environmental degradation. Maintaining that

consumption requires the maintenance of environmental quality.

Despite support for curbing the pollution of others, not all consumption patterns in the U.S. provide behavioral evidence of support for protecting the environment. The solid waste data presented above is evidence of such a pattern. Nevertheless, the popular consensus for protecting the environment in the U.S. is strong and cuts across all regional, racial and socioeconomic categories. Clearly, this type of consensus facilitates social learning about the environment and allows an incremental approach to policy making to work effectively.

#### **4.0 Science, Technology and the Environment**

Much of the progress we have made in protecting the environment has been the result of development and implementation of technological fixes to environmental problems. We reduce air pollution by utilizing newly developed environmental controls such as catalytic converters on autos and scrubbers on electrical power plants. We treat sewage before dumping it into waterways. In sum, we use science to fix the mess that science has helped develop. The question is can we fix problems as quickly as we create them? The answer to that question is no. The question then becomes, can we fix the most pressing problems fast enough to maintain a livable environment? Here the answer is more complicated. What do we consider to be a livable environment? Are the shanty towns and slums in developing countries livable? When is an environment so dangerous that we consider it unacceptable? If we create a technology that causes disease in some percentage of people, but we develop a cure for that disease, is our tolerance for a lethal environment expanded?

To some degree the environment is a problem of science and technology. We invent new products and put them to use before we project their effect on human health, the biosphere and the local ecology. Until now, this technologically based economic development has raised living standards and increased population throughout the globe. The benefits are unevenly distributed, but the results are undeniable. Can science and technology keep up? When science cannot develop a fix, can we slow down the introduction of new technologies until we can figure out how to use them safely?

Experience over the past thirty years provides evidence on both sides of this issue. In the United States, the problem of nuclear waste and reactor safety has ended the expanded use of nuclear power to generate electricity. A number of toxic substances such as DDT have been banned as well. Chlorofluorocarbons- the refrigerants that cause damage to the ozone layer of the atmosphere are being gradually banned and replaced. At the same time, France has continued to rely on nuclear power for electricity and DDT is still used as a pesticide in some developing nations. My own view is that if the harm is easily proven and a clear technical fix is in place, with strong government intervention, technological fixes can be implemented. If the price of the substitute is too high, or the technology is not fully developed, it is more difficult to eliminate a dangerous technology. For example, if fossil fuels were not relatively

plentiful at the moment, the risk of nuclear power would be given less attention than its benefits.

Another issue is that the problems caused by the impact of technological innovation on the environment are difficult to measure. Sometimes the problems take a long time to develop. Other times it is difficult to attribute the damage to the introduction of a specific technology. Even more difficult are problems that are caused by interaction effects of one or more technologies in varied ecological settings. The problem of environmental impacts is unavoidable because they are the byproduct of the strength and power of the scientific method.

The scientific method is based on the concept of the controlled experiment. The researcher isolates the variables and only examines the specific variables being treated to a particular test. The goal is to identify and understand causal relationships “all things held equal”. In the natural ecological environment, nothing is held equal. The interactions and relationships that take place can best be understood at the system level where controlled experiments are rare. While experiments in the traditional scientific method are reductionist, and attempt to reduce the test to a simple causal relationship, ecological systems are holistic and interconnected and cannot be understood through reducing reality to simple relational terms. Models are needed that estimate interaction effects and take into account multiple feedback loops. Technologies developed with reductionist methodologies must then be introduced to environmental impact studies that are based on a different conceptual framework and orientation.

In a controlled experiment, the whole test is designed to demonstrate an effect. When one is discovered and verified it becomes a fact. When a model is built we leave the world of scientific certainty and enter one of probability statements and other unknowns. It is difficult for an environmental scientist who suspects a harmful effect to compete with the power and the certainty of a technology's proven benefit. When an environmental modeler thinks he or she may have uncovered a destructive effect, it is initially expressed as a probability statement. In fact, the most persuasive scientific evidence of environmental damage must rely on models to develop hypotheses for relationships that are then tested in reductionist controlled experiments. Only at that point can the factual basis for environmental damage be conclusively established.

Improvements in environmental measurement technology and in environmental modeling provide some hope that we are learning and will do a better job of detecting, understanding and ending practices that damage the environment. However, the information provided on environmental damage will not easily or always be factored into decision making. To the degree that the public is educated about environmental threats there is evidence that they can be a powerful force behind active environmental protection policy. Unfortunately many of the threats to the environment are long term, difficult to prove and hard to explain.

## 5.0 Environmental Policy Design as an Influence on Damaging Corporate and Private Behaviors

The environment as a public policy issue should be conceptualized as a form of government regulation of corporate and individual behavior. The bulk of this section will deal with the design of policies that regulate corporate behavior, since that has been the main target of environmental policy and regulation. Toward the end of this section of the paper I will discuss the regulation of individual behavior and the problem of social learning<sup>1</sup>.

In the past three decades we have heard a good deal of political, popular and professorial discussion of the concept of regulation. Regulation is criticized for harming the economy, stifling entrepreneurial initiative, discouraging technological advances, and for being insufficiently cost-effective. Economists criticize lawyers for being overly formalistic and not understanding how firms behave. Policymakers criticize economists for proposing policies that seem sensible but are not politically feasible.

### 5.1 Defining Regulation

Kenneth Meir has defined regulation as “any attempt by the government to control the behavior of citizens, corporations, or subgovernments”. (Meir 1985, p.1). Regulation is a set of rules or directives intended to cause specific behaviors in target populations. Modifying his definition slightly, I would substitute the word “influence” for “control”. Regulated behaviors in my view represent tendencies and incremental actions rather than goal-seeking, rationally controlled behaviors. Control is simply too strong a term. Organizations for the most part do not truly control their own actions; instead, these actions are the result of a variety of internal exchange relationships and influence evidenced by explicit and implicit bargains and the deployment of potential and actual incentives.

The goal of regulation is to influence individual or organizational behavior. To provide a graphic example, consider the case of automobiles converging on a corner traffic light. The behavior of the driver is hopefully influenced by the color of the traffic light. The signal is relatively clear, although when the light turns amber the driver is faced with the need to make a rapid decision (slow down or speed up?). What factors affect the driver’s decision to slow down, speed up, or stop? Certainly, the following factors come into play:

1. Is the signal working?
2. Does the driver see and understand the signal?

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<sup>1</sup> This section of the paper is based on: S. Cohen, “Employing Strategic Planning in Environmental Regulation” in *Flashpoints in Environmental Policymaking: Controversies in Achieving Sustainability*. New York, SUNY Press, 1997

3. Is the driver willing to adhere to the signal?
4. Is the car mechanically capable of stopping and/or accelerating?

Are the regulated parties, in this case the drivers, capable of changing behavior in the desired direction, and are they willing to do so? The goal of regulation is to influence the variables that enter into a regulated party's calculus of the costs and benefits of compliance. What are the incentives and disincentives to stopping at a red light?

1. An incentive to stop might be the presence of a fully loaded trailer truck that will hit you if you do not stop.
2. A second incentive to stop might be the ticket the highway patrol officer could give you if you go through the light.
3. A third incentive to stop might be your belief in the rule of law.
4. Another incentive to stop may be a pre-patterned behavior which causes you to see a red light and move your foot toward the brake.
5. A disincentive to stop might arise if you have a severely ill child sitting in your back seat, and you were on your way to a hospital.
6. A second disincentive to stop might arise if there were no traffic visible and you were really in a hurry.

The goal of traffic regulation is to reinforce the incentives to comply so that they outweigh the potential motivation to pass the red light. The goal of regulation is to influence the perceptions and behaviors of regulated parties. Therefore, each regulatory program must be based on a strategy that seeks to understand the motivations of regulated parties and to influence their behavior.

## **5.2 Policy Design: How to Develop and Implement a Regulatory Strategy**

Strategic regulatory planning is an effort by government to develop a comprehensive strategy or tactic for influencing behavior. There are two components to this plan. The first is the formal regulation itself; the second part is the manner in which the regulatory plan is implemented. Extra-regulatory elements that can be manipulated to encourage compliance include funding, technical assistance, exhortation, and publicity. Since willingness and capacity to comply with regulation can vary widely within a given regulated community, it is critical to have an array of regulatory mechanisms available. It is also important to approach the task of influencing behavior without ideology or preconceptions.

One might argue that it is administratively or legally unfeasible to target regulation to maximize influence on the behavior of regulated parties. The administrative argument is easy to counter. First, regulations are now individually tailored through the permit process. Second, it is possible to deal with groups of regulated parties and tailor approaches to classes of regulatory situations rather than to individual organizations. Finally, an approach focused on changing the behavior of regulated parties will tend to be less process-oriented, and

therefore, less administratively complex. It will also look for strategic alliances between different parties who share a similar interest in the successful implementation of the regulatory program

The issue of legal feasibility is the argument that the law cannot be adjusted to account for an organization's willingness and capacity to conform to the law's requirements. Regulatory enforcement through the courts, one should note, typically results in bargains that take into account what an organization is capable of and willing to move towards compliance. We might as well acknowledge that the application of environmental rules involves these negotiations, and the notion that the law is applied without consideration of feasibility is simply untrue. In fact, Cass Sunstein (1990, p. 416) argues that when regulators are compelled to implement rules that do not allow them to consider issues of feasibility, they frequently fail to act. A more typical response than inaction is to negotiate a deal. Frequently, this involves a compliance schedule and other government concessions.

A strategic approach to regulation would acknowledge the reality of the bargaining situation up front and develop compliance strategies with input from the regulated community. Under these circumstances, enforcement and the threat of enforcement is reserved for recalcitrant organizations that willfully violate agreements, engage in deception, or are unwilling to change their practices.

### **5.3 The Tools of Strategic Regulation**

The term "command and control" has been used to describe a process where government commands a regulated party to act in a certain way and then uses the legal system to control behaviors that are not in compliance with the rules. As Cohen and Kamienecki (1991) write, the traditional notion of command and control is a very simplistic view of regulation. In our view, regulation involves all government policies and programs deployed to influence the behavior of regulate parties. Our definitions of regulation included command and control regulation, the use of market mechanisms and a wide variety of other techniques of influence.

There is no need to choose between command and control and market mechanisms. Neither is necessarily better than the other. Each target of regulation must be assessed to determine what mix of incentives and disincentives will result in the desired change in behavior. There are a variety of techniques of influence available to government regulators:

1. Market solutions and economic incentives.
2. Insurance programs.
3. Self-regulation.
4. Taxes and fees.
5. Education, information disclosure and the use of media.
6. Reporting and formal compliance tracking.

7. Licensing.
8. Permitting.
9. Standard setting.
10. Grants, training and compliance assistance.
11. Assessing penalties.
12. Inspections.
13. Adjudication.

These activities include both coercive and relatively noncoercive actions. All things being equal, policy design should favor the least coercive methods that obtain the desired results. The regulatory actions discussed here should be seen as a partial listing of activities typically available to regulators to influence the behavior of regulated parties.

1. **Market solutions and economic incentives:** Government sells permits to pollute to firms who may only pollute to the level allowed in the permit and may sell these permits to other private parties. This encourages permit holders to reduce their own level of pollution and maximize the cost effectiveness of pollution control.
2. **Insurance programs:** Government requires private parties to carry insurance in order to clean up unanticipated releases of pollution and compensate victims of negative environmental impacts. For example, a gas station owner might be required to carry insurance to pay for the cost of cleaning up any gasoline leaks, and to pay third party liability claims arising from these leaks.
3. **Self-regulation:** Government permits an industry to regulate itself. The use of industry codes and professional ethics are examples of such self-regulation.
4. **Taxes and fees:** Government charges regulated parties for each unit of pollution or waste created. Alternatively, tax the raw material that eventually causes the pollution, as in Superfund's tax on oil and chemical feedstocks.
5. **Education, information disclosure and the use of the media:** Government informs the public about regulatory violations or about dangers, causing negative public relations for a company. An example is the warning label requirement on cigarettes. Government may also use the media to educate regulated parties about regulatory requirements and their purpose.
6. **Reporting and formal compliance tracking:** Government requires regulated parties to report on their compliance with rules. This is less expensive than inspections and can begin the process of creating the institutional capacity in regulated firms to comply with a rule. Whoever fills out the form must at least pay some attention to the regulation.
7. **Licensing:** Government certifies competent professionals who can assist with

- compliance. The best example of this method is the regulation of Certified Public Accountants, who facilitate compliance with tax regulations. In the environmental area it might be possible to certify environmental auditors and other professionals who could help a firm reduce and prevent pollution.
8. **Permitting:** Government requires firms to obtain a permit in order to pollute legally. A permit can call for gradual reductions in pollution. The absence of a permit can result in a judicial order to close a factory.
  9. **Standard setting:** This is the traditional command part of command and control regulation. There are two basic types of standards. The first type is the performance standard, which requires the accomplishment of specific goals but does not specify how one achieves those goals. A second type of standard specifies a process, technology or practice that a regulated party must deploy to be in compliance with a rule. This simplifies compliance and oversight of regulatory compliance by requiring a specific, easily measurable activity. However, it also reduces the discretion a firm has to determine the most cost-effective mode of compliance.
  10. **Grants, training and compliance assistance:** Many of the targets of regulation are individuals and small businesses that are willing to comply but lack the capability or resources to do so. Sometimes grants, loans, or even loan guarantees can help a small business obtain the capital needed to comply with a regulation. Training and consulting services can also have a large impact, especially in areas where regulation and technologies are new.
  11. **Assessing penalties:** Penalties are typically fines charged against violators. Penalties are particularly complex disincentives that must be used with great care. A penalty that is too low is simply absorbed into the cost of doing business. A penalty that is too high can result in extensive litigation and high transaction costs for the agency. It can also lead to illicit avoidance behavior and/or political opposition to the legitimacy of the regulation and even the regulator. Nevertheless, as the Internal Revenue Service (IRS) has learned, a well-targeted penalty with sufficient publicity can result in widespread compliance to an agency's rules.
  12. **Inspections:** Visits by regulators to regulated parties to determine compliance is an important part of the traditional command and control model. Inspections provide evidence that regulated parties are following the rules. A more important use of inspections, especially if they are random and unannounced, is to stimulate compliant behavior due to fear of an impending inspection. How many people keep careful tax records out of fear that one day they will be inspected by an IRS tax auditor?

13. **Adjudication:** Formal adjudication is an administrative or judicial trial to determine if a regulated party has violated a rule. The threat of adjudication can often promote compliant behavior.

## 5.6 A Strategic Approach to Regulation

The choice between command and control and market-based regulation is a false one. All regulation involves gradual, strategic calculation and bargaining. Command and control results in regulations that adjust the law to reality, permits that interpret regulations in the light of real-world constraints, and judicial and administrative bargains on how permits should actually be implemented. Donald Elliot, former EPA General Counsel notes that:

It is important to recognize that we don't have to have and we don't have an all or nothing system in which we have either an incentive-based system or a health-based system of command and control regulations. Many of our environmental problems, like many of our other legal problems, involve a complex coming together of different goals and different moral norms. The system cannot simply optimize any single value like controlling the total amount of pollution at the least cost but must be responsive to multiple values. Multiple goals for hybrid systems... Thus a combination of health-based standards and market-based incentives may be preferable to either standing alone. (Elliot, in Breger et al. 1991, p 479)

A broader framework is needed that provides policymakers with a menu of devices depending on what and who is being regulated. Some substances are so toxic that command and control is needed. Some regulated parties are so weak that they will need to be paid to comply or driven out of business. In other cases a market can be created and environmental improvement can be accomplished through this mechanism.

Where possible, market mechanisms can be used to encourage compliant behavior and avoid the legal and administrative costs of direct regulation. Where necessary, government should provide subsidies and trading and consulting services for organizations that do not have the capacity to comply with regulation. On occasion, government may decide that the costs of subsidizing regulation are so high and the benefits of regulation so important that a business should be allowed to die in order to protect the environment. These instances should be as infrequent as possible or the political support for protecting the environment will erode.

Policy analysts often lament the fact that environmental goals are often sold to the public with fear and inadequate risk assessment, and to politicians for their value as "pork". They argue that the goals of legislation and regulation should be based on careful scientific consideration of risks. (Landy et al.: 1990) Similarly, economists frequently argue that policy designs should reflect a careful assessment of costs and benefits, and should seek to achieve

the maximum possible bang for the minimum possible buck. These ideas seem rational and attractive, but unfortunately they are not always feasible in the messy, pluralistic, federal, divided power political system we operate in. Sometimes the cost-benefit analysis is difficult to conduct. Our problem is that the distribution of costs and benefits can be unpredictable and distribution effects can be more politically salient than overall costs and benefits. Another problem is that some costs and benefits cannot be compared without questionable assumptions about the relative weights assigned to specific cost and benefit factors.

There are no short cuts. Each regulatory program must be based on a strategy which seeks to understand the motivations of regulated parties and seeks to influence their behavior. Whether we decide to employ direct regulation, indirect market mechanisms, or direct subsidies, none of these approaches will work without a profound understanding of the firms being regulated. Developing the administrative capacity in government to make these assessments is far more important than making decisions on which regulatory mechanism is superior. With this knowledge in hand, environmental regulators can then develop flexible dynamic strategies to reduce and prevent pollution in the real world.

### **5.7 Policy Design that Regulates Individual Behavior and Stimulates Social Learning**

To some degree, regulating corporate behavior has the effect of regulating individual behavior, and if the corporation is large enough the impact can be massive. By regulating the pollution produced by all the cars produced by a large auto manufacturer, government changes the behavior of all the individuals who drive cars made by this company. The compliance of a small number of parties with a rule eases the administrative problems of convincing millions of people to behave in new ways.

Unfortunately, not all environmental problems can be addressed through the regulation of corporations. Some environmental policies involve reaching individuals, educating them, influencing their values and changing their behavior. The example of solid waste and recycling both require individual behavior change. To recycle, people need to sort their garbage within the household. Even if the technology of garbage sorting advances, public understanding of the importance of recycling is needed to ensure that government continues to sort waste for reuse.

Most important is the requirement that individuals learn to value the natural environment. While it is true that the value is expressed as a part of the consumer culture of the West, there is no requirement that people continue to consume the “economic good” of environmental quality. Living without nature may sound like science fiction, but the fact that people camp-out, visit the beach, and enjoy nature is an expression of learned values. It is not a form of innate behavior. If we stop valuing environmental quality and passing that value to our children, the environment will not generate support in the political or economic marketplace. People might decide to experience nature as virtual rather than actual reality. While a totally technologically based world might have some appeal to confirmed urbanites, at

this point we do not have the technology or the energy required to totally supplant natural systems with human-made systems. Therefore, our survival depends on the use of natural systems to generate our sustenance. The value of protecting the environment must be learned at the individual level if we are to survive.

The levers to inspire this social learning include prices and other economic incentives that lead people to learn about the environment and value it. Other mechanisms for social learning include the curricula in our educational system as well as the mass media. All have been used and will need to be continued to reinforce the message of the importance of environmental protection

## **6.0 Environmental Management**

Once the political dust settles, and a policy design is adopted, the environment becomes a management issue. For policy to become meaningful in the real world it must be translated from words to deeds. Policy and management are related. Cumbersome, complex policy designs are typically more difficult to implement than simple designs. Policy designs that exhort or mandate private action are less certain to be carried out than policy designs that provide concrete incentives or punishments (disincentives) for private actions.

However, even the simplest policy designs can be wrecked through bad management or political interference. Take for example the case of the Federal Water Pollution Control Act of 1972. Section 208 called for “area-wide regional water quality management plans”. Section 201 provided a grant program to help local governments build sewage treatment plants. The idea was that “208 plans” would be used to determine the best place to locate a sewage treatment plant, and plant siting should be based on environmental rather than political criteria. Unfortunately President Nixon impounded the funds authorized and allocated by Congress to pay for section 208 planning grants. Due to the lobbying efforts of local governments and construction companies he did not impound the funds for building sewage treatment plants. Billions of dollars were spent through the 1970's on plants that were sited without assessing their role in regional water quality management. As a result, some plants were located in the wrong place. Some communities overbuilt capacity and needed to attract development to help pay the cost of plant operation and maintenance. Other areas found their growth and development stalled due to inadequate treatment waste capacity.

Despite the lack of planning, and the mistakes made, the sewage treatment program was a great success. At its high point in 1976, the federal government spent \$9 billion annually on grants to local governments to build sewage treatment plants. This number gradually declined to about \$2 billion a year in the 1980's. The grant program was replaced by the State Revolving Fund Program which provides low interest loans to cities for environmental infrastructure needs including sewage treatment and systems to control nonpoint sources of pollution. The result of the sewage treatment program and regulation of industrial discharges of pollution is obvious and measurable. In 1974 EPA data indicated that

only 40% of the rivers in the U.S. were safe for swimming and fishing. Today, 60% of the rivers are safe for these purposes.

How did the U.S. government organize itself to accomplish these results? First, a decentralized federal structure was put in place. The EPA helped stimulate the creation of state level environmental organizations and they in turn encouraged the development of local units. Early in the process of regulating industrial polluters, the EPA delegated enforcement implementation to the states. Policy was developed in Washington, but the actual monitoring and enforcement was carried out by state and local governments. This helped ensure that national rules were interpreted to accommodate local political reality. While this may have slowed down initial efforts at pollution control, over the long run, states, with occasional prodding from the EPA's regional and headquarters offices, achieved results.

In the case of municipal sewage treatment, the federal government designed specifications for the plants, suggested contractors and reviewed their competence, and provided significant funding. The strategy of eliciting state and local buy-in through grants worked. While in the long run the federal share of these facilities was relatively small, initially few governments could resist the "free" federal funding. Ultimately, the operation and maintenance of these facilities was more costly than the initial capital outlay. The growth of the average American homeowner's water bill in the 1980's and 1990's is a direct result of the need to pay these ongoing costs. I think it is unlikely, or at least less likely, that sufficient political support for sewage treatment would have been generated if people had fully known and understood the total cost of constructing and operating sewage treatment plants.

From a management perspective, the water pollution control program's strategy had some useful features. First, it focused on the biggest source of pollution--municipal sewage and the pollution of large industrial facilities. Only a few actors needed to change their behavior to implement the program. The decentralized structure and use of private contractors ensured that centralized bureaucratic clearance was not required during sewage treatment plant construction. The public works approach had the advantage of visible concrete accomplishments.

For policy words to become policy deeds goals must be clear and well understood. The tasks to be carried out must be simple. Joint actions between organizations and even between individuals should be minimized. The technologies required to implement policy should be well developed and "off-the-shelf". If new technology is needed, not only must it be invented and then de-bugged for the real world, it must also be explained to those expected to require it, install it, maintain it and monitor its functioning.

One difficulty with the management of environmental policy is that environmental programs tend to take a piece of a larger problem and subdivide it in order to work on a solution. For example, we use sewage treatment plants to reduce the amount of raw sewage we dump into the water, but the treatment plant creates a sludge that must either be dumped

in a landfill or in the sea or burned. Either way the solution in one environmental media creates a new problem in another media. Our hope is that by gaining a measure of control over the process of releasing the pollutant into the environment we can minimize the damage it might cause. I mention this here to note that the analysis of management effectiveness and efficiency must move beyond the performance of the organization and its narrow task, and must be broadened to consider management of the entire ecological system being maintained.

Finally, there is the question of goals and the definition of success. The 1972 Federal Water Pollution Control Act set the goal of ending discharges of pollution into navigable waters by 1977. A nice thought perhaps, but a ridiculous, unachievable goal. The Superfund toxic waste clean-up program had a similar problem in goal setting. After a decade of hard work and billions of dollars of expenditure, the press reported that less than a dozen toxic waste dumps had been “cleaned up”. What they did not report was that over 10,000 threat removal and emergency response actions had taken place and millions of people had been moved out of pathways of potential exposure to toxic chemicals. Unfortunately, EPA sold the Superfund program to Congress with the promise that toxics sites could be cleaned-up and made usable. The goal of identifying toxic sites and removing people from harm’s way was never articulated. At the time, we had no experience in cleaning up a waste site, and an important accomplishment of Superfund’s first decade was that we learned how to do this. We discovered that a full restoration of a toxic dumpsite was very expensive, and that often it was more cost effective contain the contaminants on site, than to dig them up or flush them out.

In the case of Superfund, a program that was a great success, the result was that it was seen as a failure. The only actual failure was the failure to set a realistic goal. Unfortunately the political support needed to obtain the resources required to build a program are sometimes won by exaggerating the possibility of success. When that happens it is important for the program’s operating managers to redefine success and try to get buy-in from key players on the new set of goals. While one might argue for stretch targets and the importance of shooting high, in policy areas of great uncertainty we need to be a bit more modest when defining success. We need to give ourselves time to learn more about the problem and step back from our early accomplishments and reassess the choices we have made of both ends and means.

## **7.0 The Case of New York City’s Garbage as an Issue of Environmental Policy and Management**

The preceding provides a framework for analyzing and understanding environmental issues. Let us turn to an application of that framework to the problem of disposing New York City’s garbage. By examining each dimension of the city’s solid waste problem, I hope to provide a more comprehensive explanation of the problem and its potential solution. I will examine the city’s garbage problem as an issue of values, as a political issue and as a problem for science and technology. I will then characterize the policy design and management dimensions of the issue.

As noted earlier, solid waste is not simply an issue in New York City, it is a national problem as well. In 1960 Americans generated 88.1 million tons of waste per year or 2.7 pounds per person per day. By 1990 that had grown to 205.2 million tons, and 4.5 pounds per person, per-day. By 2000, the per capita growth of waste had peaked and remained at 4.5 pounds per person per day, but the total amount of waste generated had grown from 88 to 232 tons per year from 1960 to 2000. (EPA Web Site: 2002)

## **7.1 Nature of the Problem**

New York City's eight million residents and millions of businesses, construction projects and non-resident employees generate as much as 36,200 tons of municipal solid waste per day. The city's Department of Sanitation (DOS) handles nearly 13,000 tons per day of waste generated by residents, public agencies and non-profit corporations, while the remainder of the waste is handled by private carting companies. During the twentieth century DOS relied on a number of landfills for garbage disposal. In December 2001 the city's last garbage dump, the Fresh Kills Landfill in Staten Island, was closed. In response, the City Council adopted a twenty-year plan for the exportation of DOS-managed waste as the exclusive waste disposal option.

New York City has a long and difficult history in solid waste management. Four years prior to the incorporation of the City of Greater New York at the turn of 20<sup>th</sup> Century, Streets Cleaning Commissioner Col. George Waring stopped the dumping of city garbage in the ocean. Instead, he implemented a radical new program that included recycling and composting. Soon, however, a new administration took office, and ocean dumping resumed until a federal lawsuit brought by a coalition of New Jersey coastal cities forced the city to end ocean dumping in 1935. With plans for new incinerators slowed by the Great Depression and World War II, the city found itself struggling to meet its waste disposal needs. In 1947, Fresh Kills first opened. Initially, Fresh Kills was said to be a "clean fill", and the city's new mayor promised that, "raw" garbage would only be landfilled at Fresh Kills for three years- the time it would take to build a large incinerator in every borough. By the 1960's, one-third of the city's trash was burned in over 17,000 apartment building incinerators and 22 municipal incinerators." (McCory: 1998) The remaining residential refuse went to Fresh Kills and the city's other landfills in the outer boroughs.

As environmental awareness grew, public pressure began to mount against incineration and landfilling. Old landfills and incinerators were gradually shut down, with the last municipal incinerator closed in 1992. By the late 1990's, only Fresh Kills remained, as a waste disposal option for the residential and public waste managed by DOS.

In May of 1996 Mayor Giuliani and Governor Pataki announced that Fresh Kills would receive its last ton of garbage no later than January 1, 2002. With the exception of the remains of the World Trade Center, that Landfill has been closed since the last day of 2001. In an effort to determine how best the City should go about disposing of the nearly 13,000 tons of waste sent to Fresh Kills daily, a Fresh Kills Closure Task Force was established. The principal goal of the task

force was to develop a short-term plan for incrementally diverting the waste from Fresh Kills up to its full closure in 2001, while the next goal was to develop a longer-term solution.

In order to divert the waste prior to the closure, the city entered into a number of three-year interim contracts with private haulers. The city's annual bill for collecting and disposing residential trash jumped by nearly 50%, to about \$658 million in 2000 and to nearly \$1 billion in 2001. While NYC was paying under \$50 per ton for disposal at Fresh Kills, some of the interim contracts fix costs at more than \$100/ton when the transportation adjustment is taken into account.

In addition to the interim plan, the city developed a "long term" plan to manage its waste. Under the long-term plan, approved by both the New York City Council and the New York State Department of Environmental Conservation, the city entered into six 20-year contracts with private waste companies. The contracts have fixed cost increases and, according to Department of Sanitation, no minimum tonnage requirements. While the plan is termed long-term, it is vulnerable to cost escalation and increased regulation from host states, and did not include careful thinking about waste transfer processes within the city. As of late 2002, waste from garbage collection trucks is dumped on the floor of waste transfer stations, where it is loaded onto large trucks for shipment out of New York City.

In the summer of 2002, the city began to take some steps to develop elements of a true long-term plan for managing waste. While the overall strategy of waste export was still being pursued, Mayor Michael Bloomberg announced a plan to develop garbage transfer stations to compact refuse and ship it by barge for disposal. These stations will be placed in waterfront locations in each borough of New York City and will replace system of land-based waste transfer that uses thousands of diesel-fueled trucks daily to haul garbage through city streets to disposal sites in other states.

The current system of waste export leaves the city quite vulnerable over the long-run. As landfill space continues to diminish and political pressure from communities opposed to waste importation builds, it is quite possible that Congress and the Courts will allow states to impose restrictions on the interstate flow of municipal waste. Bills are continually brought before Congress that would authorize local governments, state governments, and governors to restrict or prohibit the receipt of out-of-state municipal solid waste. While the passage of these bills is far from certain, the possibility over the next twenty years is large enough to warrant concern. Similarly, stricter regulations on new landfills by federal and state Environmental Protection Agencies could increase the cost of new landfills and limit future landfill capacity. Finally, landfill operators will certainly raise prices to the highest level they can generate and state and municipal governments are sure to enact taxes on waste disposal.

## **7.2 NYC's Solid Waste as an Issue of Values**

The issue of New York's solid waste must begin with an analysis of its value basis.

This begins with the values that shape the consuming patterns that create 13,000 tons of garbage each day. The use of great amounts of packaging material, and the relative lack of “recycling” behavior are reflections of the community’s collective values. The preference for exporting waste is based on a desire to avoid the potential environmental insult of treating garbage and on the values that underlie the Not in My Back Yard Syndrome (NIMBY). The consuming behavior that I am describing shows little sign of fundamental change. While the rate of increase of waste disposal has followed national trends and has finally peaked on a per-capita basis, New Yorkers clearly value the benefits of the throw-away society. The value system that supports this mode of consumption dominates and has kept waste reduction off the political agenda. This is not simply a New York City issue, but one of the consumption patterns of all modern, developed economies. New Yorkers probably place a higher value on convenience and service than may be typical, but the difference is one of degree rather than kind.

### **7.3 NYC’s Solid Waste as a Political Issue**

The core of the solid waste issue is the local politics of siting and the assumption that a residence located near a waste facility is less valuable and less healthy than one located elsewhere. Garbage is inherently undesirable, and it is difficult to put a positive spin on serving as the host for a community’s waste. The political antipathy to waste in New York was evidenced for over two decades by the local politics of waste in Staten Island. The highest priority for most elected officials in the borough during the 1990’s was closing Freshkills landfill. In the late 1980’s and early 1990’s, the borough engaged in an effort to secede from New York City, in part, to end the use of Staten Island as a dump. As a sparsely populated Republican borough in a Democratic city, Staten Island had little leverage until Republican Rudolph Giuliani was elected Mayor in 1993.

There is a long-standing antipathy to siting waste facilities in New York City. In the 1980’s, with great conflict and enormous political courage, then Mayor Ed Koch was able to obtain an agreement to site a waste incinerator in each borough. Mayor Koch’s incinerator agreement collapsed during the Dinkins and Giuliani administrations; as each mayor decided that community opposition to siting was too intense to oppose. The politics of waste, particularly the community politics of siting has been the principal constraint on policy options for managing the city’s waste.

There are a number of strategies that can be pursued to overcome the politics of siting. Environmentalists might argue against landfilling and long-distance waste transportation. A local community might decide to accept a high level of side payments in return for agreeing to host a facility and might begin lobbying to receive a waste-to-energy plant. A governor might make the point that the long-term needs of the region require a permanent solution to the waste problem and put together a comprehensive region-wide program of recycling, waste reduction, waste-to-energy and landfill construction. For all of this to take place the political calculus would need to change dramatically, or a local elected leader would need to develop

an unusual degree of political courage. In the near term, this appears unlikely and the waste issue will remain principally a political issue centered around siting. Defined this way, it is unlike that a long-term solution to the city's waste management problem will become a serious item on the city's political agenda.

#### **7.4 NYC's Solid Waste as an Issue of Science and Technology**

The population density of New York would never have been possible without a number of technological innovations: subways, electricity, the water system, modern sewage removal and treatment, product packaging, food refrigeration, preservatives, transportation and, of course; solid waste removal. The technology of incineration has advanced dramatically since the 1960's when a large portion of the city's waste was burned in apartment incinerators. Regional or local waste-to-energy plants, supplied by marine transfer stations are in all likelihood the most environmentally sound method of disposing the waste generated by 8,000,000 residents and another 4,000,000 workers or visitors present in New York City on a typical day. (Earth Institute and Habitat: 2001) With marine transfer and modern incineration, the amount of truck miles driven is as low as possible, the ability to collect and recycle toxics and heavy metals is maximized, and the potential for waste leaking from landfills is reduced.

The politics of siting dominates the issue, however, because experts are not trusted, and the government has little credibility. Science has a "solution" to this problem, but politics makes it impossible to utilize this technology. If science could reduce the emissions from the plant to zero, and if experts credible to the public and interest groups could confirm the improved technology, scientific fact *might* influence the political dialogue. However as the global climate change debate indicates, the more complex the issue the more probable that scientific uncertainty will remain. While science influences the politics of siting, NIMBY, and the self interest of some local community based organizations continues to take precedence over scientific information.

#### **7.5 NYC's Solid Waste as a Public Policy Issue**

Until recently, the use of inexpensive local landfills kept the price of waste disposal practically invisible, and so there were no major issues raised by the cost of waste disposal. With costs rapidly rising, cost benefit calculations are starting to appear in the policy making process. If costs continue to increase, and regulatory obstacles begin to develop to long-distance waste transport and development, the waste issue could emerge as a priority public policy problem. However, while in the past three years the cost of disposal has risen dramatically, alternatives to waste export has still not achieved substantive status on the political agenda. Still, costs could continue to rise and other jurisdictions could begin to resist receiving New York's waste. These changes could have the impact of redefining the issue, and providing legitimacy to alternatives to waste export.

The rising costs of disposal have had the effect of increasing the cost feasibility of long-term

capital investment in waste disposal. This is one of the reasons that waste-to-energy incineration has emerged as a (remote) possibility. When New York City owned its own landfills and could dispose of waste for \$20 a ton, these facilities were too expensive to be considered. With disposal costs now 500% higher, capital investment becomes feasible, and if costs continue to rise, the definition of waste disposal as a public policy issue may change.

Another aspect of the solid waste issue as a policy issue are its regulatory dimensions. Waste disposal is regulated by local, state and federal governments in the United States. Individuals and apartment building staff must package and sort their garbage in particular ways for it to be picked up. If it is not packaged or sorted correctly those disposing garbage are subject to fines or non-collection. The visibility of the issue and the immediacy of enforcement make the regulatory dimensions of this issue relatively straight-forward.

Finally the department itself is subject to a variety of regulations of its equipment, workforce and its waste disposal practices. In this respect Sanitation is both a regulator of the behavior of other parties and a regulated party itself.

## **7.6 NYC's Solid Waste as a Management Issue**

Removing garbage from residential, institutional and commercial locations in New York City is a major logistical and operational task. Private firms remove the waste from the city's commercial establishments, but the city's residences, governments and non-profit organizations produce 13,000 tons of waste each day that is removed by the City's Department of Sanitation. To do this the Department employs:

- 7,600 Uniformed Sanitation Workers and Supervisors.
- 2,100 Civilian and Clerical Workers.
- 2,000 collection trucks.
- 450 street sweepers.
- 275 specialized collection trucks.
- 280 front end loaders, and;
- 2,360 various other support vehicles.

(<http://www.nyc.gov/html/dos/html/dosfact.html>)

Most of the management tasks of garbage removal do not present major challenges to DOS managers. Recycling and waste transfer/final disposal are two exceptions to that general conclusion. Due to previous investment in specific types of collection trucks, the Department must conduct separate runs for recycled paper, glass, plastic and mixed garbage. Due to budget cutbacks, the high cost of these separate trips and a poor market for recycled goods, the city reduced its recycling program in 2002.

Waste transfer is the process of removing garbage from the collection vehicle and transferring it to a vehicle that will bring it to final disposal. The Department's long-term plan is to establish a set of marine transfer stations in each of the city's five boroughs. These facilities will allow trucks to drive in, have their contents compacted and then loaded onto

barges for shipment to a disposal site. Siting and constructing these transfer stations is a political and fiscal challenge, but this work does not present any management issues. There are many examples of such facilities in operation throughout the world. Currently waste transfer in New York City is land based. Collection trucks dump their contents onto the floor of a building. They are then picked up by front-end loaders and loaded onto trucks for transportation out of the city. This an expensive, and environmentally damaging practice, but it is well organized and operated successfully by the Department. The major unsolved management dilemma is the certainty and price of long-term disposal. Currently the city has contracts with out of state landfills and incinerators to accept the city's waste. The price of disposal continues to rise and the supply of disposal sites is not guaranteed.

### **7.7 New York City's Solid Waste Issue: A Summary of It's Multiple Dimensions**

In the case of New York and its solid waste, the politics of siting disposal facilities dominates all aspects of the issue. The issue is therefore preeminently an issue of politics. The dominance of politics limits the options for policy design. The issue is one that requires some form of government-funded infrastructure. The type of infrastructure that might be developed is constrained by attitudes toward waste and the politics based on those attitudes. A set of strong values and beliefs underlie the political dimension of the issue. The public's attitude toward consumption and an "out-of sight, out-of-mind attitude toward waste, makes it difficult to use data to combat NIMBY. While science can help provide information on environmental impacts that could effect policy design, such data has little chance of being incorporated into the current policy dialogue. The operational management dimension of this issue is not central. While certainly it is possible to do a poor job of managing waste removal, the city's government has a high level of competence in the operational aspects of waste removal.

One of the reasons we study the multiple dimensions of a policy issue is that we hope that a more complete understanding of the issue can help us understand the issue, and can provide insight on change processes. We can study the evolution of an issue, and look for change agents and levers that might be employed by policy makers and public managers as they seek to shape policy. Clearly, it is unlikely that a solution to New York City's waste disposal crisis will be developed without a strong effort at grass-roots, community based environmental education. Of course, if out of state waste sites close and the price of disposal continues to grow, residents may be asked to trade off the economic costs of massive tax increases against the mainly symbolic insult of hosting a waste-to-energy plant.

## **8.0 Conclusion**

It would be difficult to find a political and policy issue more important than the issue of environmental quality. It would be difficult to find a more fundamental environmental issue than solid waste disposal. The waste issue, like the environmental issue more generally, will

be around for a long time and is centrally related to who we are, what we are and in what way we will live in the future. Similar to other political issues, it comes with its own mythology and substantial ideological baggage.

In the U.S., we have had thirty years of intensive trial and error to guide contemporary environmental policy and management. In New York City, the waste management issue has been on and off the agenda virtually since the five boroughs were consolidated as the City of New York in 1898. The current crisis of landfill capacity is less than a decade old. This paper has attempted to draw on that experience to identify some lessons that might be applicable in the future and in other jurisdictions. The U.S. experience provides evidence that GDP growth and pollution growth can be decoupled. It provides evidence that a representative democracy can educate itself about a complex technical issue and frame workable approaches to that issue. The New York City garbage issue illustrates the complexity of environmental issues and the number of dimensions that can be presented by a simple issue like waste disposal. It provides a less optimistic picture of the potential for social learning

The U.S. and New York City, examples however, can only be pushed so far. The resources needed to prevent pollution can be massive. The political force needed to clean the environment must be great and must be maintained over a very long time horizon. I like to think that the political issue of environmental protection is beginning to look a bit like police and fire protection. It is an essential and expected service of government. It relates directly to our physical well being, and we assume that government will do what must be done to keep us alive and out of harm's way. In fact, the protection of life and limb is the most basic and fundamental of government functions. We expect security from "barbarians at the gate" and from poisons in our air, land and water.

The field of environmental policy and management is relatively new, highly technical and complex, and enjoys widespread public and elite political support. Symbolic policy disagreements exist and persist. Priorities and values differ and the definition of environmental quality is sometimes disputed. Moreover, we find it easier to create environmental problems than developing policy designs, management approaches and technical solutions to those problems. On fundamentals there is little disagreement: we all need to breath air, eat food and drink water if we hope to stay alive. These tasks cannot be performed over the long run, without a reasonably healthy biosphere. The maintenance of the biosphere is a fundamental function of government- within nations and between nations.

Solutions to environmental problems require a deep and fundamental understanding of specific environmental issues. Each issue has a value, political, technological, policy and management dimension. The solutions to these problems must account for these individual dimensions and the interaction effects among these issue dimensions.

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