

Recycling and Waste Disposal

PA CleanWays, a grassroots organization dedicated to the cleanup and prevention of illegal dumping throughout the Commonwealth, recently completed a project through the Pennsylvania Department of Conservation and Natural Resources to cleanup and explore ways to prevent illegal dumping in State Forests and State Parks. The project was funded through a grant authorized by the Forest Lands Beautification Act.

The Professional Recyclers of Pennsylvania (PROP) partnered with CleanWays and the Pennsylvania Environmental Council (PEC) to explore ways that illegal dumping might be prevented. PROP's primary role was to research what demographic factors played a role in illegal dumping and how programs and collection systems impacted the incidence of dumping. This excerpt from the project report focuses on the research undertaken by PROP and attempts to draw some conclusions from the large amount of data collected during the survey process.

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Recycling and Proper Disposal

Executive Summary

PA CleanWays asked the Professional Recyclers of Pennsylvania (PROP) to research factors influencing illegal dumping. PROP's role was to collect, compile, and analyze data and perceptions gathered from local, county and state officials through a comprehensive illegal dump survey that would:

- Gather basic information about the community or county.
- Inventory solid waste services and programs offered.
- Find out where dumping problems are greatest.
- Determine what materials are most problematic.
- Gauge what programs have made the most difference in preventing illegal dumping.

In addition, PROP was to develop a statewide database of appropriate disposal and recycling options.

Surveys were developed and distributed to 48 states, all Pennsylvania counties and municipalities. Forty of 67 counties responded, as did 386 of 2600 municipalities, providing statistically valid results for the municipal surveys. Despite a higher margin of error for the county surveys, they are cited as they show important tendencies and perceptions. Disappointingly, no state surveys were returned.

The surveys did substantiate and quantify many relationships between waste management practices and illegal dumping and other improper disposal habits. The findings are extensive and additional findings may be identified with further analysis. These findings are valuable in understanding why people dump, not only on state lands but also throughout the Commonwealth.

- Illegal dumping is a complex problem. To fully understand it, we looked not only at illegal dumping but also other indicators of waste disposal problems:
 - Household waste accumulation,
 - Bulky waste accumulation,
 - Households without waste collection service,
 - Inconvenient and distant recycling and disposal facilities, and
 - Type of hauling system.
- When presented with convenient and affordable options, a very large portion of the public will handle their waste and recyclable material properly.
- Smaller, rural, financially challenged municipalities are confronted with a great many obstacles in establishing solid waste management programs that address the needs of their communities. Many responders requested technical assistance in this area.
- Even larger, urban communities can experience dumping problems if their collection systems are less than ideal and there are opportunities to dump illegally.
- Whether urban or rural, small or large, there are several waste collection services that make a significant difference in decreasing dumping. These include:
 - Curbside recycling programs,
 - Mandatory waste collection ordinances,
 - Bulky waste collection programs,
 - Single hauler (contracted or municipal) collection systems.

The survey research confirms the complexity and widespread nature of the illegal dumping problem. It also shows that no one entity typically solves the problem by itself. It will take the efforts of several state agencies, both local and county government, non-profit organizations, and a broad base of public citizens.

Purpose

In examining recycling and proper disposal, PA CleanWays' and the Professional Recyclers of Pennsylvania's (PROP) purpose was to obtain and assemble information that would assist in addressing regional and statewide issues that impact illegal dumping.

Background

PA CleanWays has learned a great deal in their decade long efforts to remediate and prevent illegal dumping throughout a number of counties in the Commonwealth. Yet no comprehensive research or survey work had ever been completed to confirm many of the perceived relationships between dumping, demographics, geography, or local services.

PROP has helped establish and expand a statewide network of recycling and waste management professionals throughout the Commonwealth, facilitating the exchange of information and innovative recycling and waste management practices. The organization and several of its committees have experience in and knowledge of waste collection systems, program administration, public education, and local government issues. In addition to Pennsylvania's only recycling conference, PROP recently began a Recycling Professional Certification program. PROP's professional development efforts have also included a number of recycling market forums, educational programs and publications, co-sponsorship of several videoconferences, and the hosting of an annual waste and recycling data management workshop,

PROP's expertise would also be valuable in the LAT (Local Advisory Team) process. The LAT's inevitably came to discuss local services, legal issues, state regulatory requirements, and related subjects. PROP's insight into these issues would be a valuable aid in the LAT process and would compliment the resources and talents of the other project partners.

Method

The approach taken in this portion of the project was to design and distribute, via U. S. mail, comprehensive, concise and user-friendly surveys that would provide data to identify possible factors influencing illegal dumping and to better understand the dynamics of illegal dumping.

PROP and CleanWays would design the surveys to:

- Gather basic information about the community or county.
- Inventory services and programs offered.
- Find out where dumping problems are greatest.
- Determine what materials are most problematic.
- Gauge what programs have made the most difference in preventing illegal dumping

To address proper disposal and recycling, a statewide database of options for appropriate disposal and recycling was to be developed. As the project progressed, the need for better disposal and recycling information became more evident. PROP and CleanWays would explore what information was available and how we could collectively make that information more accessible.

Results

The Survey

The surveys asked about illegal dumping tendencies, collection programs, local services, enforcement efforts, and local ordinances, as well as important demographic information. In addition to questions about dumping on state forestlands, questions were designed to elicit broader responses to why people dump. Survey compilers believed it would be beneficial to understand what factors and forces drive people to dump. Any factor that might play a role was included in the survey.

Survey Design

The surveys were designed as a standard size (8.5" by 11") three-page document with a cover page explaining the purposes and goals of the research.

The municipal survey requested information and perceptions on a number of waste management issues and was divided into five sections.

- Municipal Background
- Illegal Dumping and Improper Disposal
- Collection Programs
- Other Local Services
- Municipal Enforcement Programs

The county survey followed much the same formula but asked more about county specific issues and programs where appropriate. Each survey asked approximately 100 questions. Most were in a check box format to allow quicker response time so that potential respondents would be more likely to complete the survey. A copy of each survey is included in the appendix.

A national survey was also designed to gather information about the problem of illegal dumping and programs to combat it in other states.

Survey Distribution

The surveys were sent by mail to every county and municipality in the Commonwealth. Surveys were also sent to officials in other 48 other states. The contact information for the state surveys was obtained from the National Recycling Coalition and the Northeast Recycling Council. When this elicited no response, a partial list of officials was obtained from the Department of Environmental Protection (DEP) and the survey re-mailed.

Of the 67 counties, 40 responded to the questionnaire. Municipal officials returned 386 surveys of the 2,600 mailed out. Such a response translated into statistically valid results for the municipal surveys. (The margin of error was +/- 4.5% at a 95% confidence level.) Though the counties completed a higher percentage of the surveys, their small overall sample size meant

that the county surveys had a higher margin of error (+/- 9.5%). Nevertheless, many of those county statistics are cited because they show important tendencies and perceptions. Despite the reasonably good response from the municipal entities in the state, the response from smaller and poorer communities was below par. More notably, municipalities where cleanups occurred and Local Advisory Teams (LATs) were established had poor return rates. That means that the results of the surveys may be slightly skewed, translating into even stronger correlations between illegal dumping and the root causes confirmed by the project. Like other smaller communities, those near the pilot cleanup and LAT areas had poor response rates. Smaller populations, lower municipal budgets, and fewer fulltime staff would decrease the chances of survey returns.

Disappointingly, no responses were received from other states in the national survey. If another national survey were to be conducted, extensive effort must be made beforehand to gather that information in a different way.

Survey Analysis

PROP staff entered data into a customized database and generated several general summaries of the responses. This, by itself, could not show statistical relationships or help to draw any conclusions beyond the most obvious. It was determined that more expertise was needed to conduct the analysis phase. The Center for Rural Pennsylvania, a research organization created by the state legislature, assisted PROP in analyzing the statistical relationships shown by the local government responses. The Center has researched a number of issues related to rural Pennsylvania's economic, social, political, and environmental condition. They were especially interested in this initiative since the problem of illegal dumping is so serious in the rural parts of the Commonwealth.

Detailed review of the results turned up inconsistencies within some of the surveys. These inconsistencies would typically arise when related questions would be answered in a contradictory manner. (For example, a community with one type of collection service would list a cost for a completely different type of waste service in the cost section.) PROP staff followed up on some of these inconsistent responses when they arose, attempting to clarify confusion that would affect the statistical analysis. Phone calls or e-mail inquiries to county recycling coordinators or municipal officials usually resolved the uncertainty and appropriate corrections were made to the database.

It should also be noted that margins of error approached 15% for the analysis of small groups of municipalities that shared certain characteristics (contracted vs. multiple hauler, communities with dumps vs. communities without dumps). Like the counties, this high margin must be acknowledged and the findings viewed as likely correlations, rather than indisputable fact.

Survey Results: Perception of the Problems

The Common Threads

A number of problems are common to communities throughout Pennsylvania, regardless of demographics or geography. The perceived root causes of illegal dumping and the general strategic approaches to prevent dumping were shared by a large portion of officials as well.

- There are consistent tendencies to where people dump.
- Hard-to-dispose-of bulky items are a significant portion of the material in dumps.
- Inconvenient recycling and disposal facilities increase dumping.
- Local recycling programs discourage dumping.
- Extensive local collection services of all types decrease the incidence of dumping.
- Local governments need and desire technical support and advice.

Where Do People Dump?

Besides the waste itself, officials believed that two geographic ingredients were necessary to facilitate illegal dumping: a low risk place to dump it and convenient access to the site. So it only follows that secluded, rural locations are the most problematic. (Even in urban areas, places with low visibility attract illegal dumping.) Wooded areas topped almost every subgroup's list of where people dump. Similarly, mountainous areas, parks and other public lands, and areas along lightly traveled gravel roads and along waterways experienced higher levels of dumping.

A look at demographic and economic variables also yielded expected results. Dumping was reported to be a greater problem in and around poorer communities. About 80% of the communities with serious illegal dumping problems were rural with a median population of 1,700, an average municipal budget of only \$329,000, and a per capita income \$1,650 below the state average.

By contrast, only 2.5% of the respondents reported illegal dumping to be a problem near more affluent communities. While this may at first indicate that poor folks cannot or will not pay for disposal or recycling, the issue is more complex. In addition to affordability, the availability of the services is also an issue. Communities with serious dumping problems had substantially fewer services available to their residents than the average Pennsylvania community.

It is also important to stress that it is impossible to trace the origin of the dumping problems through a survey. The lack of local services, enforcement, or education in one community may encourage dumping in both the home community and adjacent rural townships. As we examine the details later in the report, illegal dumps will not be the sole indicator of solid waste management shortcomings. We will also look at residential trash accumulation on one's own property, bulky waste accumulation on one's own property, and problems with open burning.

Though it is clear that the causes of dumping are numerous and complex, the greatest problems are in the Commonwealth's less populated, rural townships. Among smaller townships (those with populations under 5,000), almost 40% reported at least one illegal dump and nearly a third (29%) reported three or more known dumps. (By comparison, only a quarter of communities overall reported at least one known dump and only 12% reported three or more.) As we will see time and time again through this report, these rural townships have many challenges confronting them:

- Distant and inconvenient recycling and disposal facilities had one of the most profound impacts on where dumping occurred.
- These townships have a difficult time providing services because of limited tax bases, small staffs, and large geographic areas.
- These townships are by their nature and geography easy places for offenders to get away with dumping.

What's in the Dump?

Survey responses reflected that traditionally difficult-to-dispose-of items, tires, appliances, bulky items, and construction and demolition (C & D) waste, head the list of materials found in illegal dumps. Though everyday household waste is a notable problem, bulky wastes, tires, appliances, and C & D waste still dominate most illegal dumps.

What Discourages Dumping?

There are many things that may discourage dumping but local officials in Pennsylvania saw four standing above the others.

- Comprehensive recycling programs
- Sound local ordinances and aggressive enforcement
- Extensive local collection services
- Convenient and affordable recycling and disposal facilities

Beyond the perception that these programs and facilities make a difference, the geographic distribution of dumps show that communities without these services and efforts are the ones much more likely to experience or contribute to illegal dumping.

Technical Assistance Needed

A large portion of respondents voiced a need for technical support to design and implement programs to address the traditionally problematic materials. LAT input also substantiated that there are many voids in the collection and processing infrastructure in the less populated parts of the Commonwealth. This presents many smaller communities with few options even when they have a desire to address these materials or other collection issues. This technical assistance would be especially beneficial to smaller communities with limited staff and budgets.

Survey Results: Reported Illegal Dumpsites

It should be noted that PA CleanWays' experience in conducting past illegal dump surveys has shown that municipalities and other government entities often report fewer dumpsites than are later found to exist. One reason municipalities may report fewer dumpsites is that they are only aware of what is situated along their local roads and not those situated along state roads, utility right of ways, private properties and other public properties.

Survey Results: Differences in Perception

County and local government officials recognized many of the same problems, agreed on many of the root causes, and envisioned similar strategies to attack the problems. Yet there were noteworthy differences in how serious the problems were perceived and how they should prioritize them.

The Scope of Illegal Dumping

County solid waste, recycling, and planning officials perceived a greater illegal dumping problem than the average municipal official. This disparity is understandable for several reasons.

- Municipal officials tend to wear many hats and solid waste problems are just one of many difficult issues confronting them.
- County officials tend to be more intimately involved in solid waste and recycling since it is their primary job responsibility.
- County staff is also more likely to see the big picture issues and the inter-municipal connections that often elude municipal officials.
- Many rural communities experience illegal dumping that originate in nearby communities rather than their own. Yet the community contributing the waste frequently experiences little illegal dumping itself because of land use patterns, population density, or fewer remote areas that would facilitate low risk dumping.

In survey responses, those that experience the dumping perceive a problem. Those municipalities that may contribute to dumping in adjacent communities do not always see the ugly results of ignoring their waste disposal needs.

County officials see this as a dumping problem in both municipalities but municipal officials in the community generating the waste frequently see little or no problem. Those that may contribute the bulk of the waste, indicate a low incidence of dumping because it happened outside their jurisdiction. To demonstrate this principle further, waste composition analyses of illegal dumping in State Forest pilot areas clearly show that the overwhelming majority of that waste originated outside the state land.

Effectiveness of Programs and Enforcement

- The effectiveness of some programs and services was also seen differently from one level of government to the next. Municipal officials were significantly less optimistic about the effectiveness of:
 - Cleanups of existing dumps
 - Local anti-litter education and outreach campaigns
 - The positive role of extensive local collection services

Municipal officials thought extensive local government services were a worthwhile preventative measure but they ranked it much lower their county counterparts did. This, too, is an important perceptual inconsistency since local government services appears to be an important way to prevent dumping.

Information Gaps

Several parts of the survey showed that noteworthy information gaps exist in getting information to municipalities and the public. Municipal officials are frequently unaware of County sponsored programs or services offered by private sector firms within their county. When counties do get this information out, it often does not get out to the public. It was especially disheartening to see how many municipalities expressed frustration over the lack of programs when those very things were listed as available services on their county survey responses.

Prioritization of Problems

Another interesting disparity between county and municipal officials was the relative difference in perception of specific solid waste management collection problems. In addition to perceiving waste problems to be less serious than counties, municipalities also ranked accumulation problems much higher than dumping problems. Residential trash accumulation, bulky waste accumulation, and complaints about the burning of waste ranked second, third, and sixth among municipal officials. County officials ranked them eighth through tenth.

Problems associated with residential and business waste generators should be more challenging to municipalities since these are typically dealt with at the municipal level. But these problems are still noteworthy to our discussions since these deficiencies contribute to illegal dumping, open burning, and improper disposal of all kinds.

Survey Analysis: Problems and Their Causes

After compilation of the surveys, the Center for Rural Pennsylvania took the statistical analysis a step further to determine the relationships between the many bits of data collected. It was

hoped that these relationships would show what factors contribute to illegal dumping, what enforcement or outreach campaigns might be effective, and how local collection services influenced dumping. Many of the suspected relationships were, in fact, confirmed and several surprising correlations also surfaced. At the same time, a few of the anticipated correlations were much weaker than expected.

Illegal Dumping

Though most municipal officials (80%) said that illegal dumping was not a problem in their community, more than a quarter reported at least one dump of which they were aware. More alarmingly, small and rural communities tended to report significantly more serious problems. Over 40% of townships with less than 5,000 people reported at least one known dump, while less than a quarter (24%) of communities over 5,000 reported known dumps. However, to conclude that small townships are the center of the problem, would be like looking at just the top of the garbage pile and assuming that the whole pile was just like the top.

What are the Indicators?

The issues surrounding illegal dumping are complex, so the statistical analysis must explore a number of relationships to decipher just what can be done to turn the tide. Our survey was designed to draw information on a number of conditions, services, and factors that seemed likely to contribute to or discourage illegal dumping and improper disposal. Illegal dumps, by themselves, do not indicate communities with serious service problems. Waste is, after all, often transported across municipal boundaries when dumped illegally. Other indicators of deficiencies in local or county services must be examined:

- Residential waste accumulation on owner's property.
- Bulky waste accumulation on owner's property.
- Open burning problems.

What are the Contributors and Deterrents?

Though the factors influencing illegal dumping and improper disposal are many, the surveys bring us back to five issues that appear to contribute to or deter dumping:

- Special local services offered,
- Cost of Services,
- Type of collection system,
- Proximity of recycling and disposal facilities, and
- Presence of a curbside recycling program.

Each of these contributes to or addresses the problems but in many different ways under differing demographic and geographic circumstances. We will explore the intricacies of each factor and see how they relate to one another.

Special Local Services

Communities with bulky waste accumulation problems are much more likely to have reported illegal dumps. Correspondingly, places with curbside collection of bulky wastes reported a lower incidence of dumping of those materials. More than 70% of the communities with bulky waste accumulation problems have no curbside collection programs for their residents. Even special one-day collections are worthwhile, but curbside service is ideal. Though a few groups in the study realized less profound benefits, special material collection programs were overall a deterrent to dumping.

Type of Collection System

Contracted or municipal collection systems are superior to private subscription systems in the prevention of dumping. Private subscription systems allow residents to pick from a number of haulers doing business in the community or county. Inherent inefficiencies and associated higher costs exist in almost all private subscription systems because trucks must travel long distances between customers.

- Communities that depend on private subscription for waste collection services have reported significantly greater dumping problems. There are 22% more dumps in such communities, while nearly 30% reported one or more dumps. By contrast, less than 20% of contracted or municipal collection municipalities reported one or more known dumps. Similarly, fewer single hauler communities have waste accumulation problems (27%) than multiple hauler, private subscription systems (37%).
- These problems are magnified in smaller townships (under 3,000 population). Only 2% have contracted or municipal collection, yet 36% have reported one or more dumps. Every one of those townships with dumps has a private subscription collection system.
- Very small boroughs (under 500 population) are also likely to have private subscription systems but because of their small geographic size, reported very little dumping within their own borders.
- Larger boroughs are much more likely to have one hauler and fewer dumping problems. Almost 92% of boroughs over 7,000 have contracted or municipal collection and the other 8% mandate that all residents have a hauler. Not coincidentally, larger boroughs have very few dumping problems and fewer waste accumulation problems. Of boroughs with more than 2,500, less than 5% reported even one illegal dump and only 20% have accumulation problems. This makes them the most successful of any of twelve subgroups analyzed in the study.
- It is also noteworthy that the vast majority of municipal or contracted single hauler systems also provide more extensive services for less money. Bulky waste collections, appliance pickups, yard waste programs, and Pay-as-You-Throw volume based pricing systems are much less likely to part of standard monthly subscription services in multi-hauler systems.

There is a common fear that pay-as-you-throw volume based waste collection systems will increase illegal dumping because people must pay more for generating more trash. While the incidence of some problems is slightly higher, the difference is not statistically significant in most cases.

- Residential waste accumulation is slightly higher in PAYT communities (39% to 34%).
- Bulky waste accumulation problems are also slightly higher (32% to 28%).
- The incidence of illegal dumps is slightly more prevalent (30% to 25%).
- Customers in single hauler collection systems were delighted with the price of their PAYT service, only 5% raising concerns over price. Interestingly, PAYT price structures

did little for multi-hauler, private subscription costs. The inefficiencies of many haulers collecting in one area were still passed on to consumers, even in a PAYT system.

- Overall, single hauler PAYT programs had, by far, the least expensive and most well received pricing structure of any other option examined.
- PAYT communities actually had fewer complaints and problems with the burning of solid waste (21% to 22%) despite the fear that residents will burn waste to avoid the cost of higher volumes of waste.

Cost of Services

Though special collections do not appear to significantly change accumulation and dumping rates, the price of all types of services does make a difference.

- Those with trash accumulation problems pay an average of \$14.36 per month for waste and recycling services. Those with lower rates of waste accumulation pay an average of only \$12.59.
- In those communities with a high incidence of residents not having collection service at all, the average monthly price is \$15.63.
- We will also see that private subscription systems reported more waste accumulation and dumping problems. Price must be a factor in this as well. Average monthly cost in private subscription systems is \$15.10 while single-hauler (contracted or municipal) collection systems average only \$10.02 per month.

Curbside Recycling Programs

The existence of a curbside recycling program is also beneficial in deterring illegal disposal. About a third (33%) of the respondents had curbside recycling programs. This generally follows the mandate of Act 101 that dictates all communities over 10,000 and densely populated municipalities between 5,000 and 10,000 have recycling programs.

- Though Act 101 does not mandate it, the recycling requirement increases the likelihood that a community will mandate that residents have hauling service. Nearly two-thirds (66%) of recycling municipalities have such a requirement, while less than 40% of non-recycling communities require hauling service.
- Curbside recycling communities reported a significantly lower incidence of residential waste accumulation problems and a slightly lower incidence of dumping problems. More than a third (34%) of all responding communities reported accumulation problems, yet well under a quarter (22%) of recycling communities reported notable accumulation. A little more than a quarter (25.4%) of all respondents knew of one or more dumps within their borders, while curbside recycling communities reported a slightly lower rate of 22%.
- Recycling communities with multiple haulers, private subscription collection experienced more struggles than single hauler systems. For those with curbside recycling and contracted service, only 21% reported waste accumulation problems, compared to 46% of all other communities.

Proximity of Facilities

Though only 11% of survey respondents perceived it as a problem, the distance from recycling and disposal facilities was a significant factor in illegal dumping and waste accumulation.

- More than 90% of these isolated communities reported accumulation problems and 45% reported at least one known dump. The statewide averages were 34% for accumulation and 25% for dump occurrence.

- These communities tend to be smaller municipalities that would usually lack the financial resources to construct or subsidize their own facilities. Almost three quarters of them (71%) have fewer than 2,500 residents.
- This also discourages recycling programs, as only 14% have curbside recycling.

Enforcement and Outreach

Though outreach was not addressed extensively in the survey, it may be that the educational efforts associated with both curbside recycling and Pay-As-You Throw (PAYT) collection programs raised awareness about waste management in general.

The two survey questions that do address education support this point. Only 26% of communities that have education and enforcement efforts reported accumulation problems, compared to 39% of the communities that have neither an education nor enforcement program.

Complimentary Findings

The Pennsylvania Environmental Council (PEC) coordinated and facilitated LAT meetings with municipal government officials, citizens, environmental organizations, watershed associations, county government representatives, and staff from both PA CleanWays and PROP (See Section 4.). Though great care was taken to allow LAT members to draw their own conclusions about dumping in their State Forests and surrounding areas, the LATs arrived at many of the same conclusions that the municipal and county survey results showed. This was an important finding because it substantiated that local citizens, environmental organizations, and county and municipal government officials perceived the problems in much the same light.

PROP's survey work had shown that there was a need for technical support to design and implement programs to address traditionally problematic wastes and LAT input substantiated that. There are many voids in the collection and processing infrastructure in the less populated parts of the Commonwealth and many would like help to address that. Many smaller communities have few options even when they have a desire to address these materials or other collection issues.

PA CleanWays' dump assessments in the State Forest dumps themselves also substantiated the survey findings. Problematic materials tended to be found in higher amounts when local collection or drop-off services were lacking. When local disposal and recycling options for specific materials were convenient and affordable, those materials were found much less frequently in nearby illegal dumps.

Waste Disposal/Recycling Database

Both survey research and LAT discussions showed a dire need for better dissemination of information on disposal and recycling programs and facilities. Coincidentally, the nationwide Earth 911 database (www.1800cleanup.org) was expanding its Pennsylvania section about the same time the project partners shared this need. Discussions with Earth 911 staff eventually helped bring about the enhancement of the database to list disposal options and facilities for non-recyclable materials.

CleanWays contacted county recycling coordinators to improve and update data provide by the Pennsylvania Department of Environmental Protection (DEP) while PROP and DEP undertook a campaign to encourage county coordinators to use the system and keep their information up to date.

Recommendations

A great deal has been learned from the information gathered and analyzed in the work done in conjunction with the Forest Lands Beautification Project. It is clearly evident that illegal dumping is a very complex issue and our state forests, state parks, and other public lands are degraded for a number of different reasons. Solving this problem cannot be done by only addressing one part of this complex issue. In the same way, the problems will be difficult to solve unless there is a cooperative effort that empowers a number of stakeholders.

State Government

State decision and policy makers should consider how changes in legislation and policy could help address some of the challenges detailed in this report.

- The promotion of comprehensive waste management at the municipal level, especially in smaller municipalities, is essential.
- Recognizing the successful results of the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101), state officials should consider incorporating some of those elements into other aspects of waste management at the municipal level.
- An important element of that strategy might be a mandatory collection requirement for all residents and businesses similar to the curbside-recycling requirement for larger communities mandated by Act 101.
- The facilitation of technical support and assistance for municipal government is a key component of this. This assistance is not only needed but many municipalities have voiced a desire for this help. This would be especially beneficial to smaller communities with limited staff and budgets. It could include help with establishing collection programs, ordinances, and intermunicipal efforts of all kinds.
- One important support mechanism for municipalities is the county recycling coordinator. Recent developments have led to a reduction of staff time or the outright elimination of this position in a number of counties. Their role in developing and enhancing recycling and sound waste management practices is still extremely important. The state should do everything possible to encourage full-time and proactive county staff.
- State agencies should also remain open to new and innovative approaches that, because of regulatory constraints or established practices, had been ignored or downplayed. This might include things like waste drop-off depots or mini-transfer stations that would address rural areas that do not have curbside or roadside service for household waste and/or bulky wastes.

County Government

County government must frequently take the lead role in addressing illegal dumping. While much of this leadership has originated in county solid waste or recycling offices, county planning commission staff, Conservation District offices, County Cooperative Extension staff, and other county entities have contributed to illegal dumping prevention and cleanup.

- Counties should consider dumping and related disposal issues when updating county solid waste management plans. Among other things, convenient and affordable disposal and recycling facilities must be available to the entire county.
- Counties should also offer whatever technical assistance they can. County Commissioners must be made to appreciate the importance and value of a county recycling coordinator and adequate funding and support staff for a recycling or solid waste office.

- It is also important for county recycling and solid waste offices to evaluate their education, outreach, and public notification strategies and strive to better communicate with municipal officials and the general public. Counties should use whatever resources they can to get information out to the public and their municipalities. The internet's Earth 911 database (www.1800cleanup.org) recently expanded its Pennsylvania database and updates from the counties are essential to make this resource effective.

Local Government

Local government's role in waste management can often be confusing since different sized municipalities have differing responsibilities. The issue is further clouded by the counties' responsibility to implement a solid waste plan and assure disposal. State law does make one thing perfectly clear. Responsibility for collection rests on the shoulders of the municipalities.

- All local governments must take their solid waste collection responsibilities seriously. This includes getting information out to the public, providing for affordable disposal, and to address difficult to dispose of materials.
- It is important for them to facilitate, not only household waste collection, but to be sure that convenient bulky waste collection is provided for.
- Construction and demolition (C & D) waste disposal must also be addressed. This does not necessarily mean that the municipality must provide for the collection of C & D material. Rather, it means that the municipality must be proactive in preventing the dumping of C & D material by monitoring construction and demolition work done within their borders.
- Local governments must do their part to get information on disposal and recycling options to the public. This includes written notices of events and requirements, updated lists of recycling and disposal firms, and instructions on disposal and recycling.
- Explore the feasibility and community acceptance of a single contracted or municipal hauling system. This might include the option of a hauling firm chosen by the resident or one that has submitted a bid for services.
- When private subscription is preferred by elected officials, the municipality should enact ordinances to assure that everyone in the community has access to curbside waste collection service and that bulky waste collection is addressed in one way or another.

Organizations and Grassroots Groups

CleanWays and other organizations have shown time and again that local involvement is one of the key components to cleaning up and preventing illegal dumps. Non-profit and grassroots organizations will be important contributors to the continuing success of any cleanup or prevention efforts.

Organizations like PA CleanWays, the Pennsylvania Environmental Council, and PROP should continue to play an important role in helping to organize cleanups, educational efforts, and technical assistance.

The Professional Recyclers of Pennsylvania (PROP) is the Pennsylvania affiliate of the National Recycling Coalition (NRC). The organization is a non-profit corporation representing recycling, composting, and solid waste professionals and recycling advocates throughout the Commonwealth. Our address is P.O. Box 25, Bellwood, PA 16617. The phone number is 800-769-PROP and we can be reached electronically on our website www.proprecycles.org or by e-mail at prop@epix.net.

Statistical Comparisons of Various Solid Waste System Characteristics

Known Illegal Dumps

Characteristic	No Known Illegal Dumps	One or More Illegal Dumps	Communities Overall
Known Illegal Dump(s) in the Municipality	74.6%	26.1%	98
Accumulation of typical household waste on residents' property		55.1%	34.1%
Bulky waste or appliance accumulation on residents' property		43.6%	27.8%
Communities that have many residents without waste haulers		20.4%	11.7%
Disposal/Recycling facilities are far away from community		30.6%	10.9%
Communities with curbside recycling programs		28.6%	32.6%
Pay-As-You-Throw volume based pricing waste collection		21.4%	18.9%
Single hauler (contracted or municipal) waste collection systems		27.6%	36.8%
Multiple hauler, private subscription waste collection systems		72.4%	63.2%

Household Waste Accumulation

Characteristic	Little or No Waste Accumulation	Waste Accumulation Problems	Communities Overall
Accumulation of Typical Household Waste on Residents' Property	65.9%	34.1%	126
Community has one or more known dumps		40.9%	26.1%
Bulky waste or appliance accumulation on residents' property		70.6%	27.8%
Communities that have many residents without waste haulers		22.0%	11.7%
Disposal/Recycling facilities are far away from community		28.8%	10.9%
Communities with curbside recycling programs		21.2%	32.6%
Pay-As-You-Throw volume based pricing waste collection		6.8%	18.9%
Single hauler (contracted or municipal) waste collection systems		26.8%	36.8%
Multiple hauler, private subscription waste collection systems		73.2%	63.2%

Bulky Waste Accumulation

Characteristic	Little or No Bulky Waste Accumulation	Bulky Waste Accumulation Problems	Communities Overall
Bulky waste or appliance accumulation on residents' property	72.2%	27.8%	107
Community has one or more known dumps		41.1%	26.1%
Accumulation of typical household waste on residents' property		77.4%	34.1%
Communities that have many residents without waste haulers		21.5%	11.7%
Disposal/Recycling facilities are far away from community		39.3%	10.9%
Communities with curbside recycling programs		24.3%	32.6%
Pay-As-You-Throw volume based pricing waste collection		3.7%	18.9%
Single hauler (contracted or municipal) waste collection systems		15.0%	36.8%
Multiple hauler, private subscription waste collection systems		85.0%	63.2%
Community has <u>no</u> bulky waste collection or drop-off program		69.2%	60.8%

Communities with Many Residents Without Haulers

Characteristic	Residents Have Curbside Trash Service	Many Residents Have No Hauler	Communities Overall
Communities that have many residents without waste haulers	88.3%	11.7%	43
Community has one or more known dumps		46.5%	26.1%
Accumulation of typical household waste on residents' property		67.5%	34.1%
Bulky waste or appliance accumulation on residents' property		53.5%	27.8%
Disposal/Recycling facilities are far away from community		48.8%	10.9%
Communities with curbside recycling programs		27.9%	32.6%
Pay-As-You-Throw volume based pricing waste collection		20.9%	18.9%
Single hauler (contracted or municipal) waste collection systems		18.6%	36.8%
Multiple hauler, private subscription waste collection systems		81.4%	63.2%
Community mandates that all residents have hauling service		25.6%	45.1%

Disposal/Recycling Facilities Far Away & Inconvenient

Characteristic	Disposal/Rec. Facilities Are Close By	Disposal/Rec. Facilities Are Faraway	Communities Overall
Disposal/Recycling facilities are far away from community	77.1%	22.9%	86
Community has one or more known dumps		45.2%	26.1%
Accumulation of typical household waste on residents' property		90.5%	34.1%
Bulky waste or appliance accumulation on residents' property		48.9%	27.8%
Communities with curbside recycling programs		14.3%	32.6%
Pay-As-You-Throw volume based pricing waste collection		18.6%	18.9%
Single hauler (contracted or municipal) waste collection systems		19.8%	36.8%
Multiple hauler, private subscription waste collection systems		80.2%	63.2%
Community mandates that all residents to have hauling service		23.8%	23.3%

Communities with Curbside Recycling Programs

Characteristic	No Curbside Recycling Program	Curbside Recycling Program	Communities Overall
Communities with curbside recycling programs	67.4%	32.6%	126
Community has one or more known dumps		22.2%	26.1%
Accumulation of typical household waste on residents' property		22.2%	34.1%
Bulky waste or appliance accumulation on residents' property		20.6%	27.8%
Disposal/Recycling facilities are far away from community		9.5%	10.9%
Pay-As-You-Throw volume based pricing waste collection		12.7%	18.9%
Single hauler (contracted or municipal) waste collection systems		61.1%	36.8%
Multiple hauler, private subscription waste collection systems		38.9%	63.2%
Community mandates all residents to have hauling service		82.5%	45.1%

Mandatory Waste Collection Requirement

Characteristic	No Hauling Service Required	Hauling Service Required	Communities Overall
Community mandates all residents to have hauling service	53.9%	46.1%	173
Community has one or more known dumps		22.5%	26.1%
Accumulation of typical household waste on residents' property		25.4%	34.1%
Bulky waste or appliance accumulation on residents' property		22.5%	27.8%
Disposal/Recycling facilities are far away from community		11.6%	10.9%
Pay-As-You-Throw volume based pricing waste collection		18.5%	18.9%
Single hauler (contracted or municipal) waste collection systems		61.3%	36.8%
Multiple hauler, private subscription waste collection systems		38.7%	63.2%