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From Dumps to Destinations: The Conversion of Landfills to Parks



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Imagine sun bathing, playing baseball, or flying a kite on top of a huge pile of garbage. Actually, there's no need to imagine—simply head out to Boston's Millennium Park. Fifteen years ago, known as the Gardner Street Landfill, it was a dump—literally. Today its 100 acres host sports fields, playgrounds, an outdoor classroom and amphitheater, six miles of walking and biking trails, and river access. As Mayor Tom Menino stated at its opening December 7, 2000, it is "a place for people of all ages and backgrounds to come for a picnic, a friendly ballgame, or some solitude."

No one has tabulated all the parks and public recreational sites created on old landfills. There are certainly more than 250, and there may well be more than 1,000. They range from the famous, such as Flushing Meadow in New York (site of two World's Fairs) and the appropriately named Mt. Trashmore in Virginia Beach, to relatively obscure inner-city basketball and tennis courts, suburban golf courses, and soccer fields. One con-

verted landfill in Berkeley is home to an international kite festival; another in Albuquerque hosts a celebration of hot-air balloons.

It would be an overstatement to say that some of the nation's best urban parks have been created from landfills, or even that capped landfills automatically make terrific parks. But in a time of severe urban space and resource constraints, closed landfills present excellent new park sites for three reasons—size, location and cost. Communities from coast to coast have been jumping at the chance to convert them.

An Urban Mission

The San Francisco-based Trust for Public Land (TPL) has developed a particular interest in old landfills. The nation's second largest land

Projected use of some of the 2,200 acres of currently open land at the site of the former Fresh Kills Landfill on Staten Island, New York. Photo courtesy of the New York City Department of City Planning.



conservation group (after the Nature Conservancy), TPL approaches its land-for-people mission in two ways. In rural and suburban areas TPL may buy virgin land for park agencies to preserve it from development. But in

Known contaminated areas of Mabel Davis Park in Austin, Texas. The park was opened in 1979 over parts of an old landfill. In March 2000 city workers discovered elevated levels of lead in the park's soil. Further investigation revealed elevated levels of pesticides. Map courtesy of the City of Austin.

urban areas its most valuable role may be to acquire previously used land and help communities recycle it for new public purposes.

TPL's roster of urban land reclamation and reuse projects today includes old rail yards in Los Angeles and Santa Fe, abandoned piers and docks in Brooklyn and Oakland, decayed factory sites in Chicago and Atlanta, an abandoned gas station in Boston, and an oil storage depot in Seattle. As people across the country rediscover the benefits of urban

living, and as older suburban areas become more built up, old landfill sites become increasingly valuable and offer similar potential.

To study the complexities of this and other issues affecting urban green spaces, TPL has created an internal research arm, the Center for City Park Excellence (CCPE). Since 2003, the center has conducted in-depth research on a range of topics from dog parks to the design of skateboard facilities; it has analyzed how park agency budgets affect park maintenance and use; and it has developed new methodologies for counting the number of park users and understanding their various needs.

Based on CCPE research, TPL has also launched a national campaign to promote the conversion of landfills into parks. Landfills are so appropriate for conversion to parks, TPL believes, that recreation planners and landscape architects should not wait until they are closed to get involved. New landfills could even be pre-envisioned and pre-designed as parks before the first bag of trash is ever disposed.

The Earliest Landfill Parks

Landfill parks go back to at least 1916 (many years before the word "landfill" was coined), when Seattle created Rainier Playfield from its former Rainier Dump. In 1935 another conversion transformed that city's 62-acre Miller Street Dump into a portion of the now-famous Washington Park Arboretum. The following year, New York closed the putrid Corona Dumps—famously called the "Valley of Ashes" by F. Scott Fitzgerald in *The Great Gatsby*—and began preparing the land for construction of the 1939 World's Fair.

Following World War II, the volume of trash and the number of landfills in America mushroomed—as



did the number that became filled to capacity. The U.S. Environmental Protection Agency (EPA) today estimates that as many as 3,500 landfills have closed since 1991. The number from earlier years has never been tracked.

In theory, turning a landfill into a park transforms a noxious liability into an attractive asset. As a “sustainable” recycling of urban assets, in many cases it works beautifully. Even a superficial investigation of American big cities by CCPE reveals more than 4,500 acres of successful landfill parks.

However, compared to a “green-field” site, an old landfill almost always requires more time and planning to

turn into a park. Indeed, complex issues of toxicity, liability, and ground settlement often conspire to prevent municipalities and private land conservancies from pursuing such projects. But these challenges are not insurmountable. In a similar effort over the last twenty years, the rails-to-trails movement has converted thousands of miles of former railway right-of-way to nature and bike trails.

In the heart of a dense metro area, a former dump may today be one of only a few large, open locations remaining on which to build a new public park. And its conversion may present an opportunity to correct longstanding local patterns of environmental injustice. Moreover, there is a good chance the landfill—which may be as small as dozens of acres or as large as 1,000 or more—will be inexpensive to buy, or free, or possibly come with some supporting funds for maintenance.

There are many financial models on which to base a successful landfill conversion. In Portland, Oregon, the parks department is getting a “free” park with all closure and conversion costs prepaid by the city’s solid waste department, which built up a reserve by assessing a per-ton fee on garbage disposed there. In Virginia Beach, the original capping and the 1986 recapping of Mt. Trashmore were paid for by the public works department; only the 2003 recapping—hopefully the last—was financed by the parks department through its capital improvement budget. In Fresno, ownership of the old municipal landfill won’t officially be transferred from the public utilities department, but the parks and recreation department will operate a new park there under a management agreement.

A cheap purchase price is important because conversion and main-

Future promenade and barge gardens at the Fresh Kills site, which will now be called Fresh Kills Park. Photo courtesy of the New York City Department of City Planning.



tenance can be expensive, even if costs are shared with the former landfill owner/operator. Depending on the age and contents of a landfill, the amount of groundwater or soil contamination present, and the planned new recreational uses, construction costs have ranged from \$500,000 for a two-acre site to \$30 million for a regional park of more than one hundred acres. Costs further depend on such factors as topography, availability of materials, cover design, and quantity reductions. Overall, CCPE has arrived at a rough average cost for landfill-to-park conversions of around \$300,000 per acre.

The south part of Fresh Kills Park will feature restored wetlands as well as hiking and biking trails. Photo courtesy of the New York City Department of City Planning.

Regulations and Resources

The case of fifty-acre Mabel Davis Park indicates some of the difficulties faced by park planners when they attempt to convert landfill sites. Located about four miles south of downtown Austin, Texas, half the park sits atop a landfill that closed in the 1950s. The site was first converted to a park in 1979, before adequate regulations were put in place, and shortly afterwards its covering began to erode and leachate pollution emerged from illegally dumped fertilizer and battery casings.

After years of mounting problems, the city was forced to close the park in 2000 and begin an \$8.5-million remediation program. According to Christina Calvery, Project Manager for the Austin Parks and Recreation Department, this meant a comprehensive redesign to bring it up to current EPA standards.

The example highlights the importance of research and regulation. Although the story of Mabel Davis Park ended happily and the park reopened in December 2005, years of pollution followed by costly repairs could have been avoided if illegal dumping had not taken place, and if the conversion had been accomplished in a way that prevented leaching.

Today many new safeguards are in place. And since November 1991 the construction of municipal landfills has been regulated by the Environmental Protection Agency. Federal law further stipulates that, no later than six months after a landfill is closed, an owner/operator must install an approved cap to minimize water infiltration and erosion. This must incorporate an 18-inch clay layer to impede water infiltration and at least 6 inches of vegetated earthen material to prevent erosion of the infiltration



layer. There usually must also be a gas venting layer and a layer of stone or geosynthetic material to keep out burrowing animals.

Federal policy also now requires that the owner/operator maintain the integrity of this cover, monitor groundwater contamination, and manage methane gas and leachate production for thirty years after the landfill is closed. Finally, there is a financial requirement to cover post-closure care as well as clean-up if groundwater contamination occurs.

In some cases government grants or loans may be available to ensure that these obligations are met. In one such case, TPL received a \$200,000

EPA grant to assist in capping a two-acre landfill in Providence, R.I., that provided a critical link in the four-mile Woonasquatucket River Greenway. TPL's Daria Ovide says the EPA grant was a significant factor in moving this project forward.

Technical Concerns

Once an adequately designed cap is in place, two significant challenges remain to reusing a landfill as a park: gas production and ground settlement. Landfill gases such as methane, carbon dioxide, ammonia, and hydrogen sulfide are created when buried waste decomposes. Methane may be released for thirty or more years after closure. Indeed, in early parks built on landfills there were occasional stories of picnickers being stunned when a column of flames erupted alongside their barbecue grills.

EPA now requires gas collection

systems, but in some cases this gas can be sold to generate revenue. One example is the former St. Johns Landfill, Portland, Oregon's, primary waste disposal site for more than fifty years. In 1991 Portland Metro closed the 240-acre dump, essentially an island of trash within the 2,000-acre Smith-Bybee Wetlands Natural Area, to begin long-term restoration. Today, most of the methane produced by the landfill is piped two miles to heat the lime kiln of a cement company. The revenue, averaging \$110,000 per year, helps pay for landfill closure operations.

Ground settlement can also be a difficult problem. Like cereal in a box, municipal landfills settle from 5 to 20 percent over a two- or three-decade period. Such settlement may cause foundations to break and sink, utility and irrigation pipes to burst, roads and paths to crack and heave, light poles to tilt, and sports fields to

The south portion of the proposed park will also house recreational spaces such as soccer fields. Photo courtesy of the New York City Department of City Planning.

crumple. Obviously, if a landfill site is to be converted to a “natural” area, none of this matters. But most recreational reuses require construction of at least trails, if not fields and various types of buildings. And more intensive reuses may require amphitheaters, pro shops, eating and drinking facilities, and meeting rooms.

The only real solution is careful planning. Since waste sits only in “cells” within most landfills, park facilities can still be safely constructed over undisturbed areas of a site, leaving the rest to support grass and shrubbery. For instance, in the current conversion of New York City’s gargantuan Fresh Kills landfill, the city proposed building numerous significant structures. According to Planning Department Project Manager Jeffery Sugarman, the challenge was to locate them properly. In the end, this wasn’t overwhelmingly difficult since only about 45 percent of the land area had actually been used for waste disposal.

Utility systems can be more of a problem. While flexible electric and telephone cables can be buried within the upper layer of a landfill cover, that doesn’t work for rigid gas, water and sewer lines. Irrigation pipe can be especially troublesome. Alternatives to buried irrigation pipe include above-ground watering systems, using grasses that require little or no irrigation, or eliminating active recreation over much of a site.

Careful planning may again be the only real answer. Calvery says much of Mabel Davis Park is now planted only with flowers and grasses native to the Central Texas plains. This reduces the need for irrigation and maintenance, and also limits the possibility that irrigation water will filter through the landfill to create leachate. Recreational areas can still be included

in carefully located areas of such a park. It can also be attractively landscaped if trees are planted far enough away from the cover to prevent their roots from puncturing it.

Putting It All Together

With a surfeit of trash, a shortage of urban green space, and improvements in land-conversion technology, the landfills-to-parks movement has a huge future potential. However, much more planning must be undertaken if this resource is to be captured to make new public spaces, particularly ones that allow the emergence of new natural areas within cities, or adjacent to them.

Even before the first truckful of garbage is disposed at a new site, careful consideration should be given by solid waste agencies, municipal park departments, and landscape architects to how the site will be converted at the end of its expected life as a dump. For example, the solid-earth “walls” between trash-filled cells could be made thick enough to later support not only underground pipes and conduits but above-ground buildings and structures.

Even without such comprehensive preplanning, however, TPL believes there is great potential for phased conversions at existing landfills. According to this model, older sections could be converted into parkland sooner, on a rolling basis, even as newer areas are still accepting deliveries of waste. Such a program would allow a more natural program of tree and plant growth. The impacts on park users might be mitigated by constructing permanent or temporary berms to screen ongoing landfill operations. And in some cases, phased conversion might even allow on-site environmental education about the reuse process.

Like retail and housing activities, the landfill business is “sprawling” and “big-boxing” in the U.S. today—shifting to gigantic operations that seem ever more dispersed and distant from urban areas. For example, Corpus Christi, Texas, is about to open a 2,000-acre landfill ten miles outside the city, with projections that it won’t be filled for one hundred years. Colorado Springs’ three landfills have a century’s worth of capacity left. Seattle now loads its waste onto trains and ships it over the Cascade Mountains to eastern Washington.

Yet, no matter how distant these dump sites may seem, it is impossible to predict where they will fit into potential patterns of population growth by the twenty-second century. Will today’s exurban landfill locations be surrounded by settlement the same way urbanized areas of Manhattan eventually displaced the farms around “distant” Central Park?

Before the U.S. finds itself involved in a broad-scale, seamless landfills-to-parks movement numerous challenges—technological, political and legal—still need to be better understood. As long as urban and suburban land was relatively cheap and available, it made little sense to pursue these. But today many of these cost equations have shifted.

With a three-pronged effort—to design safer, more easily reclaimable dumps, work more closely with community activists, and assure protection from legal liabilities—communities and nonprofit groups like the Trust for Public Land may someday create a vast new network of urban and suburban parks from areas once best considered out of sight and out of mind.