

Executive Summary

Working Draft for Distribution, July, 2008

**THE ENVIRONMENTAL AND ECONOMIC IMPACTS OF
BROWNFIELDS REDEVELOPMENT**

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Purpose and Use of this Report

This paper is termed a “Working Draft for Distribution.” That term is meant to convey that the report is being widely distributed for review and comment, and that the findings are subject to revision. Readers/reviewers are free to cite the data and findings, but NEMW advises that citations should also refer to the document as a “working draft.”

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The review panel included:

- Jared Creason, EPA National Center for Environmental Economics
- Lee Ilan, New York City Mayor's Office
- Joe Cronyn, Lipman-Frizzell and Mitchell, real estate consultants
- Chis De Sousa, University of Wisconsin at Milwaukee
- Jesse Silverstein, Colorado Brownfields Association

Another resource provided to NEMW was an unpublished master’s thesis by Greg Lewis, a fellow NEMW staffer. The thesis covered two Baltimore case studies and their impacts on Baltimore neighborhoods.

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EXECUTIVE SUMMARY

This paper seeks to summarize established quantifiable impacts of brownfields redevelopment in the areas of environmental, economic, community, and fiscal effects. Brownfields redevelopment, supporters claim, can represent gains on many fronts. On the economic development side, there are employment gains, leveraged investment, and revitalized neighborhoods. Fiscal impacts include generating new sources of local revenue derived from previously unproductive land and lowering requirements for investment in infrastructure to accommodate growth. On the environmental side, brownfields redevelopment, when compared to greenfields development, saves land from the negative externalities associated sprawl, reduces air emissions and greenhouse gases, improves water quality through reduced runoff, and generally accommodates growth in an environmentally responsible fashion.

This paper reviews the evidence related to each of these purported benefits and attempts to quantify the impacts. The approach is primarily a literature review. The author has relied on existing research, which has been assembled, compared, and analyzed in order to highlight the most relevant data and reconcile different findings. Then, using this refined impact data, the report applies the findings to two hypothetical public investment scenario which seek to estimate the impacts of additional federal spending on brownfields.

Environmental Benefits of Brownfields Redevelopment

- ***Cleanup/Reduced Threat to Public Health.*** Almost 50,000 sites have completed state Voluntary Cleanup Programs (VCP) programs since the inception of VCP programs in the mid-1990s. This pace, estimated at 6,000 to 7,000 sites annually, reflects vast progress, although it still represents a small portion of the need – the current pace is addressing, at best, 1.4 % of the inventory, annually.
- ***Responsible Growth and Saving Land from Destructive Sprawl Development.*** One acre of redeveloped brownfields has been estimated to conserve 4.5 acres of greenfields sprawl development. With brownfields increasingly being used for dense residential and mixed residential redevelopment, brownfield sites collectively represent a particular opportunity for environmentally responsible accommodation of population growth. According to the U.S. Conference of Mayors 2007 report, 82 responding cities estimated that redeveloping brownfields could accommodate 2.8 million households.
- ***Air Quality Improvements.*** The findings from three case studies indicate that brownfields projects, in comparison to alternative greenfields projects, save between 20 percent and 40 percent of vehicle miles traveled. This translates directly to air emissions reductions or savings of a similar magnitude.
- ***Saving Energy and Reducing Greenhouse Gases (GHG).*** “Urban Compact Development” reduces transportation-related greenhouse gas (GHG) emissions by 20 percent to 40 percent in comparison to sprawling/spread development patterns. Brownfields case studies indicate similar reductions. This 20 to 40 percent reduction may understate the GHG benefits of urban compact development and brownfields

redevelopment because it does not include several land use related energy benefits, such as lower “line-loss” in distributing electricity to dense urban areas relative to spread suburban areas, and the lower energy requirements for building and maintaining infrastructure.

- ***Water Quality Impacts/Reduced Runoff.*** An EPA study concluded that there are very significant water quality benefits of dense development due to lowered run-off per dwelling unit. Brownfields redevelopment, because it tends to be higher density, also tends to improve water quality.

Economic and Community Impacts

Studies of brownfields redevelopment indicate that the majority (between 55 and 80 percent) of brownfields projects involve public subsidy. The following discussion relates only to those projects that require this public investment.

- ***Employment and Investment Impacts.*** Although there is no comprehensive national data that represent the full breadth of brownfields redevelopment activity, two sources give an indication of the impacts:
 - The EPA Brownfields Program has leveraged 48,238 jobs and \$11.3 billion in new investment as of March, 2008.
 - The 2007 U.S. Conference of Mayors survey indicates that 150 cities have successfully redeveloped 1,578 brownfields sites. Eighty of the reporting cities also listed permanent job impacts which totaled 115,600 jobs.
- ***Leveraging Investment.*** Interpreting the results of eight studies with widely varying results, NEMW concludes that public investments in brownfields leverage total investments at a ratio of approximately \$1/public investment to \$8/total investment. Brownfields-related subsidies for site assessment, cleanup, and site preparation leverage total investment at a higher ratio of 1 to 20, consistent with Milwaukee studies. The 1 to 20 ratio is the average public cost to make the land “development ready.” Brownfield sites in severely distressed areas require higher subsidy levels, as much as double the ratios indicated here.
- ***Leveraging Employment.*** Interpreting results from six studies with widely varying results, NEMW concludes that it takes between \$10,000 and \$13,000 in public investment to leverage one job. Isolating public costs for brownfields-related site preparation, NEMW concludes that an average \$5,700 in public costs leverage one job. For reference, the standard for judging investments by the U.S. Department of Housing and Urban Development and the U.S. Small Business Administration is \$35,000 per job.
- ***Neighborhood Revitalization as Measured by Property Value Increase.*** Cleanup and redevelopment lead to property value increases on the order of five percent to 15 percent for properties that are up to 3/4 mile from the site. However, there are documented cases where “impact” projects, usually involving change in use from

industrial to parks or mixed use, have had much higher impacts, even exceeding 100 percent.

Fiscal Impacts

- ***Direct Generation of Local Tax Revenue.*** From the micro/project-specific perspective, public investments in brownfields are generally recouped from local taxes generated by the project within about five years, although tax credits may extend this period. From the macro perspective, the U.S. Conference of Mayors survey found that redeveloped brownfields in 62 surveyed cities could lead to \$408 million in annual local tax revenue. Further, the survey found that redeveloping remaining brownfields could generate between \$1.3 and \$3.8 billion in local taxes.
- ***Lower Investment in Infrastructure.*** Brownfields and greyfields usually have infrastructure in place so there is a cost savings in building and maintaining infrastructure relative to alternative new/sprawl development. The magnitude of this cost savings is uncertain. One analysis pegged the savings at as much as \$1/brownfields vs. \$10/greenfields. The literature in the area of sprawl vs. new “compact development” suggests smaller increments, where the differential is 10 to 35 percent. Future research may reconcile these findings in that there is likely a significantly greater infrastructure savings attributable to brownfields/greyfields relative to new compact development.

Linchpin Effect

- In some instances, brownfields redevelopment is the catalyst or the linchpin that creates a positive environment for new investment and leads to transformation of entire neighborhoods and districts.

Impact Projections for Additional Public Investments in Brownfields

NEMW has used the findings above and in the body of this report to estimate the impacts of additional investments in brownfields.

NEMW is not advocating for any particular policy or budget. Never-the-less, if policy-makers are considering additional public investments in brownfields, NEMW is in a position, as a result of this report, to estimate the impacts of those additional investments. Therefore NEMW created two federal funding scenarios and estimated impacts, as follows:

- Reauthorize the EPA Brownfields Program with double the current appropriations level of \$165 million annually;
- Authorize a new brownfields tax credit with a \$1 billion cap (consistent with HR 3080).

In order to calculate impacts NEMW made an assumption that the new federal funds would provide one-third of needed public investments – that state and local government would provide two-thirds. This federal share is somewhat higher than the current finding that the

federal government is providing 20 to 25 percent of public funds for brownfields, and it reflects a concept that many in brownfields spheres share – that the federal government should be a more equal partner.

Then using the leverage ratios and benefit data from the report, NEMW calculated the impacts of the additional investments. NEMW advises that these are “order of magnitude” estimates and projections, not precise predictions.

Table 1. Estimating the Incremental Impacts of Additional Federal Investments in Brownfields Funding

<i>Impact area</i>	<i>Ratio/factor</i>	<i>Double the EPA Brownfields Budget – add \$165 million</i>		<i>Adopt a federal brownfields tax credit w/ \$1 billion cap</i>	
		<i>Assume that federal dollars provide 33% of public investments – state and local provide remainder</i>			
		<i>Annual impact</i>	<i>20-year cumulative impact</i>	<i>Annual impact</i>	<i>20-year cumulative impact</i>
<i>Total investment leveraged</i>	\$1 public investment leverages \$8 total investment	\$4 billion	\$79 billion	\$24 billion	\$480 billion
<i>Jobs accommodated</i>	\$11,500 public investment leverages one job, and 70% of brownfields will be job-producing	30,100 jobs	603,000 jobs	183,000 jobs	3.65 million jobs
<i>Population accommodated in existing developed area</i>	40 percent of brownfields sites will be residential or mixed residential, and densities will be 15 DUs per acre	4,500 households	89,300 households	27,100 households	541,000 households
<i>Land conservation</i>	1 acre brownfields redeveloped corresponds to 4.5 acres conserved	3,300 acres	67,000 acres	20,300 acres	406,000 acres