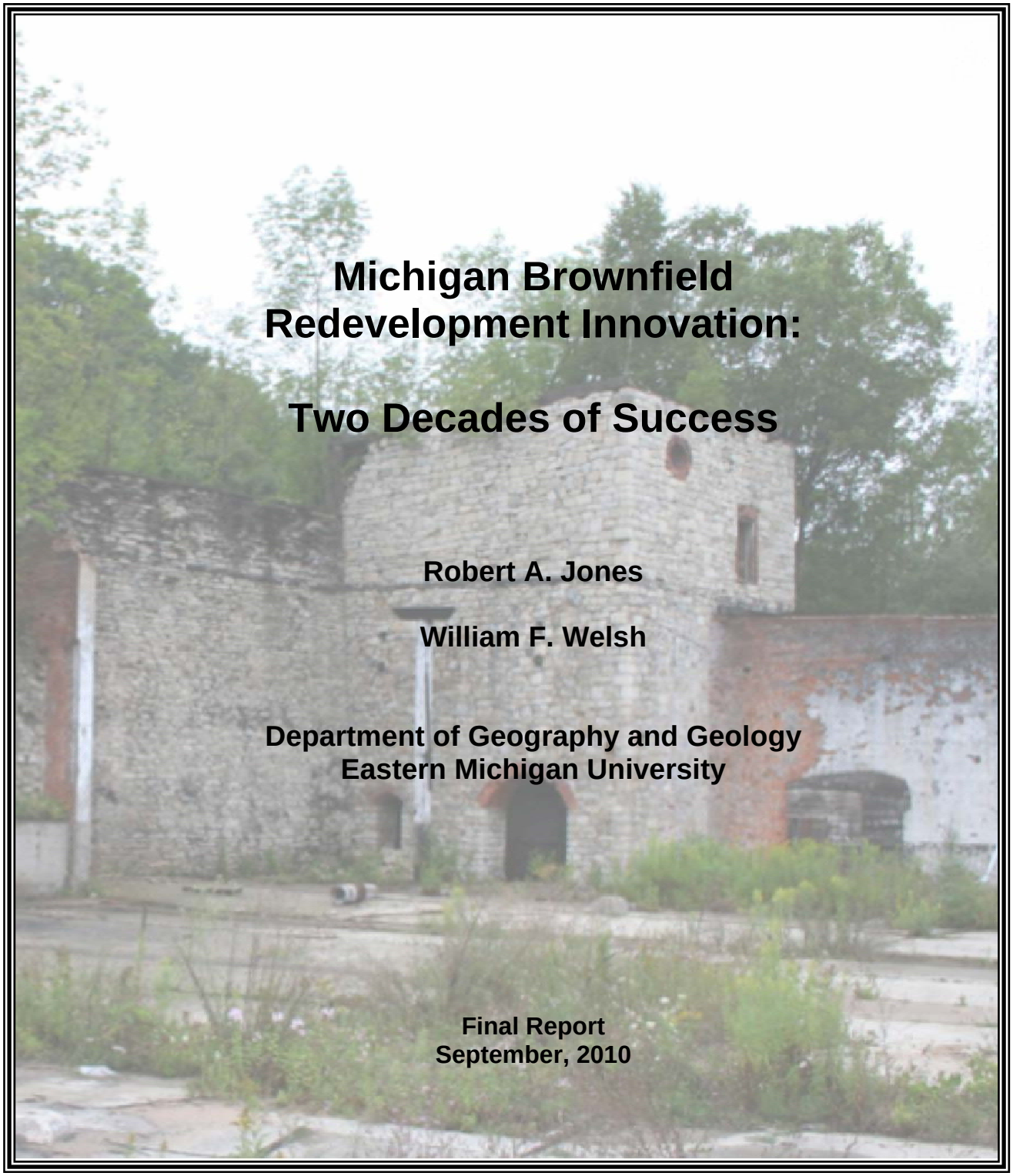

Michigan Brownfield Redevelopment Innovation:

Two Decades of Success

Robert A. Jones

William F. Welsh

Department of Geography and Geology
Eastern Michigan University

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Abstract

Industrial, economic, and other transformations have left Michigan with a vast array of vacant, abandoned, and underutilized property that, if properly managed for environmental health and safety issues, can be very desirable for redevelopment. Over the past two decades the State of Michigan has developed numerous policy innovations and financial incentives to aid in both the environmental remediation and redevelopment of these properties. However, there has been little evaluative research done, particularly on the redevelopment aspects of these brownfield projects.

This paper presents findings from a research project that examines Michigan's efforts at brownfield redevelopment. It analyzes efforts from six Department of Environmental Quality aid programs that help fund environmental remediation efforts to support redevelopment. Two questions are asked in this effort: First, has Michigan brownfield redevelopment been successful within the state environmental, land use, and redevelopment policy contexts? Second, can the lessons learned from this understanding of the causes and consequences of brownfield redevelopment success serve to enhance the likelihood of success for future brownfield projects? This research effort looks at possible metrics the state might use in assessing the relative level of success for individual brownfield redevelopment projects. It also, through a series of case studies of state-assisted brownfield redevelopment projects, looks as some of the possible ingredients that help lead to a successful redevelopment effort.

The overall conclusion reached in this project is that the state is doing well with its investments in brownfield redevelopment, but it could be doing more to help ensure that its limited funds are going towards remediation and redevelopment projects that are most likely to be successful in both short- and long-term impacts.

Remains of an old foundry in what is now a new park along Betsie Lake in Elberta await disposition. Of the projects examined, Elberta's park is one of the few brownfield redevelopment sites where historic preservation plays a major role .

Michigan's Brownfield Redevelopment Legacy

As a result of its unique geographic location in the Great Lakes region, its 19th and 20th century industrial heritage, and recent state, national and global economic transformations, Michigan has been left with a significant number of contaminated brownfield sites throughout its Great Lakes coastal areas. These brownfield sites are defined by the federal Environmental Protection Agency as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant" (US EPA 2006). The term "brownfield" came into use during the 1970s among planners and others involved in economic development work in the US. However, the term originally referred to any previously developed property, irrespective of contamination issues (Yount 2003, 26-27). The current official use of "brownfield" as a contaminated site came into use in 1992 at a US congressional field hearing hosted by the Northeast Midwest Congressional Coalition. Since then the federal government has promoted the re-use of brownfields, largely because of the existing infrastructure and buildings already in place for such previously utilized properties.

Meanwhile the State of Michigan was also very active in supporting brownfield redevelopment, recognizing that cleaning up and reinvesting in these properties takes development pressures off undeveloped or open land, and both improves and protects the environment. Michigan's growing awareness of issues related to urban sprawl and the development of valuable open space and agricultural resources in Michigan has led to increasing demands for the redevelopment of these industrial brownfields (Michigan Land Use Leadership Council 2003). Whereas the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 emphasized the notion that property owners should pay the cost of remediating brownfield properties, irrespective of who may have done the polluting, Michigan realized that such an

approach would lead to very little actual site remediation. Rather, landowners were abandoning these contaminated properties and allowing them to become tax delinquent.

A growing awareness of the issues and potentials associated with brownfield remediation and redevelopment led to the passage of a brownfield remediation and redevelopment bond measure by Michigan voters in 1988. Known as the Environmental Protection Bond fund, it included $45 million specifically targeted for site redevelopment purposes. Now more than two decades later, two programs still remain active from this early bond measure: the Site Assessment Grant Program, originally funded with $10 million; and the Site Reclamation Grant Program, established with $35 million in bond funds.

By the mid 1990s the concern for brownfield redevelopment led Michigan to become a leader in crafting innovative brownfield policies. Through both administrative and legislative action, Michigan cast aside the singular federal focus on cleanup of toxic sites and the imposition of strict liabilities placed on property owners. The new Michigan approach was specifically targeted to encourage redevelopment, relying on a combination of private initiative and public support (Hula 1999; Hula and Bromley 2008).

Michigan propelled itself to the forefront of brownfield redevelopment through the implementation of policies and programs that:

- limit the liability of those who purchase contaminated property;
- allow flexibility in clean up standards based on the redeveloped use of the site;
- rely heavily on voluntary clean up and redevelopment action;
- recognize economic redevelopment as a primary brownfield policy goal;
- enhance public funding for site assessment and redevelopment activities; and
- expand the definition of brownfield to include an array of blighted properties.

To aid with this last point, state voters approved a second bond measure, the Clean Michigan Initiative (CMI) in 1998, authorizing $675 million in general obligation bond funds for environmental clean up efforts, with a significant portion of the funding dedicated to programs supporting local redevelopment efforts. Among the CMI brownfield redevelopment programs are the Brownfield Redevelopment Grant Program established with $37.5 million; the Brownfield Redevelopment Loan Program established with another $37.5 million in CMI funds; and a $50 million allocation for a Waterfront Redevelopment Grant Program. In addition to these bond-funded programs, the state established a Revitalization Revolving Loan Fund in 1996 with an initial legislative allocation of $5 million. Together the six brownfield redevelopment programs funded by the two bond initiatives represent over $155 million of the approximately $1.4 billion that the state has expended for brownfield remediation and redevelopment work as of September 30, 2008 (Michigan Department of Environmental Quality 2008).

Now more than two decades past the original Environmental Protection Bond, and over a full decade after implementation of CMI programs, bond monies available to local communities for brownfield redevelopment through the six Michigan Department of Environmental Quality

(DNRE)[1] programs have become scarce, and the state's long-term financial prospect to supplement CMI funds does not look bright. Thus, it is critical to assess the success of Michigan's brownfield redevelopment efforts in order to better understand the causes, consequences, and potential correctives of brownfield redevelopment with an emphasis on common elements of "successful" redevelopment projects.

A significant problem that DNRE has had in undertaking an assessment of the brownfield redevelopment projects it has supported over the past twenty years is that, with the exception of the Waterfront Redevelopment Grant Program, funding from the brownfield redevelopment programs supports remediation activities, but it cannot be applied to the actual redevelopment effort. Further, although the six programs require that redevelopment potential be considered and most funding applications include some semblance of a redevelopment plan, the DNRE has very little authority and even less capacity to evaluate and monitor the redevelopment effort of projects it helps to fund.

MDNRE Program	Start Date	Funding Source	Allocation	Remaining Funds (end of FY 2008)
Site Assessment Grant	1989	1988 Environmental Protection Bond	$10 million	$240,000
Site Reclamation Grant	1989	1988 Environmental Protection Bond	$35 million	$1.15 million
Revitalization Revolving Loan	1996	Michigan State Legislature	$5 million (initial allocation)	$2.1 million
Brownfield Redevelopment Grant	1999	1998 Clean Michigan Initiative	$37.5 million	$7.1 million
Brownfield Redevelopment Loan	1999	1998 Clean Michigan Initiative	$37.5 million	$9.2 million
Waterfront Redevelopment Grant	1999	1998 Clean Michigan Initiative	$50 million	$0
TOTAL			**$175 million**	**$19.8 million**

Table 1. Michigan brownfield redevelopment programs included in the study (source: MDEQ Consolidated Report, FY-08)

Research Questions

This study of Michigan's brownfield redevelopment efforts began with a question formulated in meetings between representatives on the Michigan Sea Grant Program, DNRE, and interested stakeholders. As refined by these parties: What are the causes, consequences and potential

[1] On January 17, 2010, the Michigan Department of Natural Resources (MDEQ) and the Department of Environmental Quality were merged to become the Department of Natural Resources and Environment (DNRE). We use the DNRE moniker throughout this paper except in cases of report authorship prior to 2010.

correctives of brownfields located on Michigan's Great Lakes coasts with an emphasis on common elements of "successful" brownfield redevelopment projects, and how can those elements be incorporated into prospective future projects? In scoping the project, this initial question was broken down into two constituent parts. First, how do we properly assess brownfield redevelopment projects, whether successful or not? Second, what makes a brownfield redevelopment project successful, or what common elements do we find in successful projects?

Has Michigan brownfield redevelopment been successful within the state environmental, land use, and redevelopment policy contexts? Can we take the lessons learned from this understanding of the causes and consequences of brownfield redevelopment success and apply them to enhance the likelihood of success for future projects? This research effort looks at possible metrics the state might use in assessing the relative level of success for individual brownfield redevelopment projects. It also, through a series of case studies of state-assisted brownfield redevelopment projects, looks as some of the possible ingredients that help lead to a successful redevelopment effort. These concerns are particularly important given that Michigan's state brownfield funds are limited, and given the current austerity of the state's budget outlook.

Because the sponsorship of this research project has come form the Michigan Sea Grant Program, the majority of the brownfield sites we examined are in coastal communities of the state. However, several of the case studies have been from non-coastal communities such as Lansing, Mt. Pleasant, Grand Rapids, and Ypsilanti. Inclusion of projects in these and other non-coastal areas allow conclusions to be drawn about brownfield redevelopment success apart from the coastal areas of the state and their associated scenic and commercial amenities.

Michigan Brownfield Redevelopment Innovation:

The Political Culture and Policy Arena

With the aid of a $60,000 Waterfront Redevelopment Grant from the Michigan Department of Environmental Quality, Tawas City constructed this riverfront park and canoe launch. It is part of a larger effort to spur new development such as the adjacent city hall (insert above) and mixed use development (lower insert).

Federal Policy Context

The 1980 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and its 1986 reauthorization, the Superfund Amendments and Reauthorization Act (SARA) established federal priority in the area of environmental cleanup, setting the standards for containment and remediation of contaminated sites in the US. Some of the more salient and sometimes controversial aspects of federal policy in this arena are:

- The imposition of cleanup costs on those responsible for contamination and subsequent property owners, including retroactive liability for contamination caused before such contamination became illegal.
- A demand that contaminated sites effectively be restored to "greenfield" status.
- A highly centralized decision-making structure located in the federal bureaucracy.

Neither of these acts showed significant concern for site redevelopment or post clean-up use, the idea being that remediation standards would prepare the site for any future use that might come along. Program goals were defined primarily in terms of protecting public health interests. Site clean up was the desired end and final policy goal.

The 1972 Coastal Zone Management Act (CZMA) provides a notable exception to the remediation emphasis of CERCLA. Section 303 of the act specifically calls for cleanup, restoration, and redevelopment efforts, making it national policy:

> to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development, which programs should at least provide for . . . assistance in the redevelopment of deteriorating urban waterfronts and ports, and sensitive preservation and restoration of historic, cultural, and esthetic coastal features . . . (Coastal Zone Management Act, Section 303 (2) F).

Despite the coastal brownfield redevelopment policy established in CZMA, it was not until the mid-1990s that the federal Environmental Protection Agency took administrative action to establish a brownfield redevelopment grant program, followed two years later by support for states to set up revolving loan funds to aid in local brownfield cleanup and redevelopment efforts. Because EPA's brownfields program was administratively under CERCLA, which is intended to address the nation's worst hazardous waste sites, many of its requirements are not appropriate in the context of funding for state and local brownfields assessment, remediation, and redevelopment. Moreover, the application of CERCLA requirements to the brownfield grant process and state efforts in this area was viewed as overly burdensome, serving as disincentive for broad participation in the EPA brownfield program.

To address some of the limitations and problems with the EPA's administrative brownfield cleanup and redevelopment program, Congress passed the Brownfield Revitalization and Environmental Restoration Act of 2001 (BRERA) to provide support for state and local efforts to revitalize communities through the assessment, remediation and redevelopment of brownfield sites. The overall intent of BRERA is to direct more public and private resources toward restoring and redeveloping contaminated properties that are not likely otherwise to be addressed by the federal government (Senate Report 107-002).

Notwithstanding the more recent efforts of the EPA and BRERA, a number of states began to take a lead role in the redevelopment of contaminated sites by the 1990s. To a great extent these states, at least initially, adopted legislation closely paralleling federal policy, giving direct control of the more limited contamination site cleanups to public authorities. For example in 1991, forty-one states imposed strict liability, 36 imposed joint and several liability and 43 imposed retroactive liability, all following the federal precedent established by CERCLA (Environmental Law Institute 1991; Hula and Hemond 2003).

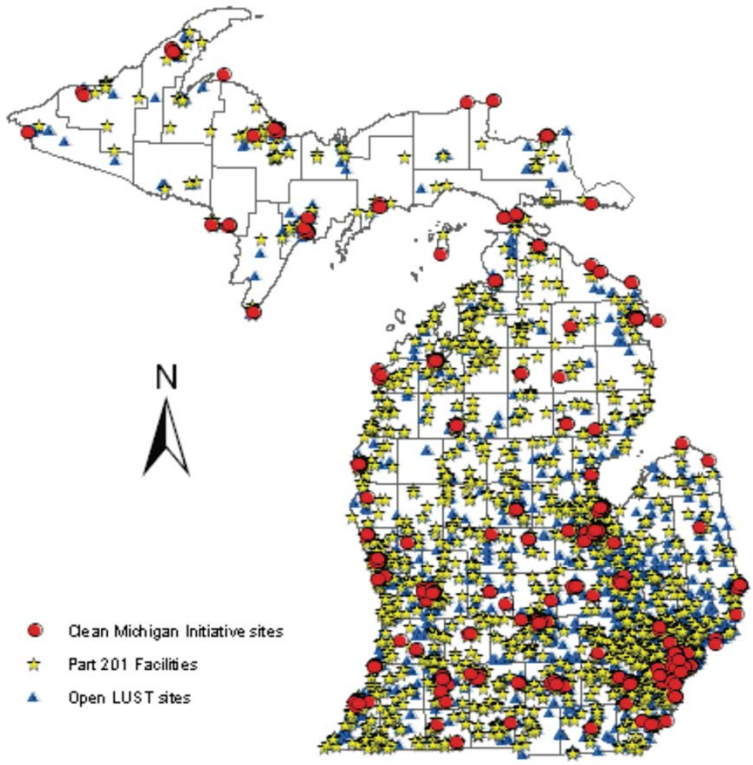


Figure 1. Map of known brownfield and leaking underground storage sites (LUSTs) in Michigan. The red dots represent the 365 sites that have been remediated with the help of DNRE funds from the six redevelopment programs.

By the early to mid 1990s the federal CERCLA paradigm was facing significant challenge from a variety of fronts, including from several states, from congress, and from within the EPA itself. Arguments were repeatedly made to transfer policy responsibility and authority to the states, not only because of the mounting opposition and growing unpopularity of the federal approach, but also because state environmental remediation capacity had increased significantly in the years following passage of the federal CERCLA legislation. "Most states now have in place a set of laws governing the cleaning of contaminated property, and have established funds to underwrite cleanup where no responsible party can be found. A number of state programs developed the necessary technical expertise to deal with National Priority List (NPL) caliber sites." By the mid 1990s states had begun their own cleanup efforts for about ten percent of the NPL sites (Copeland, 1997).

States began to experiment with a variety of alternatives to the CERCLA model. Voluntary programs for site remediation that relied more on incentives than the coercion of federal law were developed as more efficient cleanup strategies. Such voluntary programs have caught on relatively quickly. From 1993 to 1998 the number of state-level brownfield cleanup programs grew from 14 to 44, with a much greater emphasis being placed on redevelopment following remediation. To be sure, though, there is a great deal of variation between states in terms of policy and administration, as well as in actual program successfulness (United States General Accounting Office 1997; Hula and Hemond 2003).

Michigan Policy Context

In 1996 Michigan became one of the first states to break from the federal policy lead in the area of environmental clean up and brownfield redevelopment. Through both administrative and legislative action, Michigan cast aside the singular federal focus on cleanup of toxic sites and the

imposition of strict liabilities placed on property owners. As former Michigan Governor John Engler stated:

> The cornerstone of any urban revitalization strategy must be an aggressive brownfield redevelopment program. We have made brownfields attractive by reforming the cleanup laws and offering tax credits and low interest loans to our communities. More than anything, our success comes from making brownfield redevelopment a top economic and environmental priority in the state of Michigan (cited in Hula 1999, 12).

Although the changes in Michigan environmental policy are broadly consistent with current federal environmental initiative, state effort varies in some fundamental ways from the CERCLA model in relation to the remediation and redevelopment of brownfields.

Michigan's divergence from the federal lead can be seen in six fundamental areas:

1) Limits on owner liability
2) Increased reliance on private/voluntary action
3) Flexible cleanup standards
4) Explicit recognition of economic redevelopment as a policy goal
5) More public funds for cleanup
6) Expansion of the definition of brownfield to include vacant and underutilized properties in blighted areas, irrespective of contamination (done in 2002)

These differences helped pave the way for Michigan's current environmental remediation efforts and established a reputation for the state as a leader in the policy arena of brownfield redevelopment.
Prior to the state Natural Resource and Environmental Protection Act of 1996, Michigan statutes followed the federal lead in imposing a strict liability framework for site contamination. This essentially meant that property ownership carried with it the liability for cleaning that site, irrespective of those who may have actually been responsible for contamination. Michigan's changed approach allows subsequent purchasers to limit their liability for contamination for which they are not responsible. For parties responsible for the original contamination, liability remains in force. In fact, current law has created an affirmative responsibility of landowners to identify and remediate contaminated sites, with the DNRE empowered to levy fines of up to $10,000 a day from any responsible party if they have not “diligently pursued” the containment and cleanup of contaminated sites which they owned. Such penalties can also be assessed to new landowners or operators of the property if the new owners or operators do not take advantage of the liability protections afforded in the current statutes

New owners and operators of potentially contaminated property can secure exemption from cleanup liability for contamination existing on the property at the time of purchase by conducting a Baseline Environmental Assessment (BEA) prior to or within 45 days of their purchase of a brownfield site. The BEA must be submitted to DNRE and the information it contains must be disclosed to subsequent purchasers or transferees. The site-specific information developed for the BEA serves as the basis from which to evaluate liability claims against previous and current

landowners and operators. The completion of the BEA is largely a private action with only limited state oversight, although the state may provide grant or loan funds to the property owner to conduct the assessment. The baseline assessment process provides a much more efficient and streamlined approach to limiting liability than the lengthy and cumbersome process of developing a "covenant not to sue," which was previously the only way for new property owners to limit liability for pre-existing contamination.

Owners and operators have the option of filing a petition with DNRE requesting a written determination of the technical adequacy of the BEA. While new owners and operators no longer bear full liability for site cleanup, they are required to meet "due-care" requirements that the public be protected from any existing contamination and that the new owner not exacerbate the pre-existing contamination. These "due-care" requirements extend to all owners and operators of contaminated sites, which represents an extension of past liability in that potentially responsible parties now have an affirmative responsibility to show "due care."

Site cleanup standards for Michigan are strikingly different from those of the CERCLA-type framework that requires remediation to a single, "greenfield" standard. Michigan has tied cleanup standards to the proposed redevelopment use. Thus, the state has created a three-tiered system with different standards for industrial, commercial, and residential redevelopment projects. Not surprisingly, industrial standards are less stringent than commercial, and both of these are less demanding than those for residential projects. Another part of this reconfiguration has reduced overall risk standards for various types of contamination. As an example, cleanup levels for known carcinogens have been set at a risk level of 1:100,000 rather than the earlier state standard of 1:1,000,000. Further, groundwater cleanup standards have also been revised to what are generally less stringent levels than previously required. Finally, the state has recognized local institutional controls on land use and restrictive deed covenants as acceptable alternatives to cleaning a site to the highest possible standard. Local zoning of a site restricting it to industrial uses, along with a notation of such on the property deed, is considered adequate for application of the least stringent remediation standard.

Another important element of the Michigan initiative is the explicit linking of redevelopment to cleanup goals as clearly expressed by Governor Engler in the passage cited above. This linkage has been reinforced through numerous state funding mechanisms. Thus, projects proposed for funding using state environmental bond funds such as the Clean Michigan Initiative (CMI -- see below) are required to demonstrate a viable redevelopment plan as well as a cleanup strategy. In fact redevelopment concerns overshadowed environmental priorities in 2001 when the state legislature modified the legal definition of brownfields to include "blighted" or "functionally obsolete" properties with specific reference to the state's core cities such as Detroit and Flint. This expanded definition of a brownfield allows environmental bond funds to be expended for the redevelopment of properties that may in fact have no contamination issues at all, real or perceived (Lang, 2001).

Michigan has also developed a number of sources of financing for local brownfield projects that typically come, not from state general funds, but rather from specific revenue streams that are targeted to local brownfield redevelopment efforts. Four revenue sources have been of particular importance in the state: the now defunct brownfield Single Business Tax credit, replaced with a

Michigan Business Tax Credit program; local Brownfield Redevelopment Authorities with tax increment financing authority; the 1988 Environmental Protection Bond; and the 1998 Clean Michigan Initiative. Brownfield redevelopment funds from both of these general obligation bond measures have been substantially depleted.

Michigan law permits municipalities to create a brownfield redevelopment authority (BRA), effectively creating a specialized local institutional structure that promotes planning for, and implementation of, brownfield redevelopment. The Brownfield Redevelopment Financing Act of 1996 and subsequent amendments provide BRAs with a variety of fiscal powers including paying or reimbursing private or public parties for environmental response activities; the leasing, purchasing, or conveying of brownfield properties; accepting grants and donations of property, labor or "other things of value" from public or private sources; investing the authority's money; borrowing money; and engaging in lending and mortgage activities associated with the brownfield property it acquires (Davis and Margolis, 1997; Michigan Department of Natural Resources and Environment 2010).

These authorities may also create a local site remediation revolving fund to finance projects. Each authority must develop a brownfield plan for redeveloping eligible properties within its jurisdiction. Elements of this plan include the identification of specific targeted parcels located within the municipality, a comprehensive financial plan including costs and how they will be financed, and a summary of the proposed eligible activities. Strategies for dealing with possible citizen displacement resulting from redevelopment efforts may also be included, although this is a very rare occurrence in practice. The brownfield plan must be approved by the governing body of the municipality before tax increment financing is available to the BRA. School tax increments become available for certain environmental response activities only after the DNRE (now Michigan Department Environmental Quality -- MDEQ) has approved a site-specific work plan (Hula and Hemond 2003, 12-13; Michigan Department of Natural Resources and Environment 2010).

Brownfield redevelopment authorities have the legal authority to raise revenue through a number of tools provided in the state legislation. These include tax increment financing authority to capture increases in state and local taxes, including school taxes, resulting from the redevelopment of a brownfield sites within the BRA district. These TIF funds can be used for a range of purposes by the BRA, including evaluation and feasibility studies of specific sites, completion of BEA activities, phase I and phase II assessments, on-site demolition of buildings to remove contamination, necessary on-site construction of remediation facilities, and the combining of contaminated property with adjacent parcels to create larger redevelopment properties. The existence of a BRA allows a qualified developer or taxpayer to apply for a tax credit against Michigan's Business Tax. These credits are available for up to 12.5 percent of eligible investments, or up to 20 percent for specific designated Urban Development Area Projects. Projects with greater than $10 million of eligible investment require special approval, and in most cases the tax credits are limited to $10 million (Michigan Economic Development Corporation 2010).

Although all of these DNRE and BRA brownfield redevelopment programs are intended to encourage brownfield redevelopment and often require some sort of redevelopment plan, funds

can typically only be applied to assessment and remediation efforts, and for some types of public infrastructure improvements. DNRE funds cannot be applied towards actual project construction costs. The intent of these CMI and BRA programs is to "level the playing field," so to speak, between brownfield and greenfield development, limiting risk and lessening the cleanup burden on developers in order to make brownfield projects financially more attractive. In part as a consequence of such funding limitations, DNRE has very little authority or capacity when it comes to monitoring and enforcing actual redevelopment efforts. Once a site has been remediated to the appropriate state standard and state funds fully accounted for, DNRE is essentially done with the project.

Funding for remediation and redevelopment projects also comes from direct revenue streams. In 1998 Michigan voters approved a $675 million environmental bond issue, the Clean Michigan Initiative (CMI), thereby providing a second important funding source for brownfield redevelopment. The CMI included $335 million targeted directly to local brownfield redevelopment efforts. CMI programs included direct funding for brownfield redevelopment projects by the state, with projects selected from among those nominated by local authorities to be directly funded by the state. Other funds are allocated through several assessment, remediation, and redevelopment programs administered by the Michigan Department of Environmental Quality. In addition, grant funds from a number of other state agencies have often been used to support specific projects. Two things are of importance here. First, although a number of CMI-funded programs required a redevelopment proposal, funds can only be applied to assessment and remediation efforts, and for some types of public infrastructure improvements. Funds cannot be applied towards actual project construction costs. Second, after nearly a decade of funding cleanup efforts, CMI funds are nearly depleted. A revolving loan program is on going, but DNRE officials estimate that other programs will run out of funds within the next year or two, with only slim prospects for legislative replacement.

Michigan Land Use Leadership and Brownfield Redevelopment

Recent political leadership in the State of Michigan has expressed a level of dissatisfaction with local land use decisions from a variety of perspectives, particularly in terms of the increasing levels of sprawl in urban areas throughout the state, and the unchecked consumption of open land for new development. There is a strong desire to concentrate more new growth within existing urbanized areas and to preserve valuable open space and agricultural resources vital to Michigan's economic well being.

In 2003 Governor Granholm signed an executive order creating the bipartisan Michigan Land Use Leadership Council (MLULC) charged with the task of identifying "the trends, causes, and consequences of unmanaged growth and development in Michigan and provide specific recommendations that address those issues" (Michigan Land Use Leadership Council 2003, 11). Among its observations, the Council noted that new development is consuming land at a rate as much as 13 times greater than the rate of population change. Moreover, virtually none of this land has previously been developed with urban uses.

To begin to address these and other issues the MLULC adopted the ten basic tenets of the "smart growth" movement:

1. Create a range of housing opportunities and choices
2. Create walkable neighborhoods
3. Encourage community and stakeholder collaboration
4. Foster distinctive, attractive communities with a strong sense of place
5. Make development decisions predictable, fair, and cost-effective
6. Mix land uses
7. Preserve open space, farmland, natural beauty, and critical environmental areas
8. Provide a variety of transportation choices
9. Strengthen and direct development towards existing communities
10. Take advantage of compact development design

(MLULC 2003, 27; ICMA nd).

This represents an attractive set of principles for which brownfield redevelopment projects can play significant roles, particularly in relation to number nine, but it also requires a strong political will for implementation in a state with overwhelming support for individual property rights, home rule, and an almost single-minded devotion to the private automobile.

In their report to the state, the MLULC showed a marked reluctance to get involved with regulatory issues related to the development rights of individual property owners such as zoning and subdivision regulation that encourages greenfield development over brownfield redevelopment projects.

> In recognition of the importance of private property rights, the unresolved legal issues surrounding government regulation, and the role of government in preventing one landowner from harming another, the council has developed its recommendations with an emphasis on state policies and decisions that focus on investments in public infrastructure (transportation, water supplies, and sanitary systems); state taxing policies; public information, education, and technical assistance efforts; management of publicly owned lands; and other government polices and decisions that indirectly affect the use of land (MLULC 2003, 26).

The reluctance on the part of state leadership to engage regulatory issues related to land development and redevelopment is unfortunate, for it means that local jurisdictions, and particularly those located at the suburban periphery, are free to continue to expand in the same land-intensive fashion they have shown for the past several decades. Little is done to encourage the adoption of local regulations that would encourage redevelopment of brownfield sites. In the face of demands from their suburban constituents, state legislators continue to show reluctance in channeling funds away from roadway improvements and expansion that serve the needs of suburban development, and encourages peripheral expansion over redevelopment of the plethora of vacant, abandoned, or underutilized properties in the state. The same is true for other areas of state infrastructure spending -- a disproportionate amount goes to suburban areas for new development (Michigan Land Use Institute 2005).

Even when presented with viable growth alternatives, local governments have been unwilling to change their ways when it comes to placing limits on suburban sprawl. Washtenaw County recently completed a comprehensive master plan that called for concentrating new development over the next 20 years in key growth nodes, most of which are located in areas where infrastructure already exists or can easily be expanded to accommodate higher density development. A significant component of accommodating growth in these nodes is the redevelopment of brownfield sites. Approved in 2004 by the County Board of Commissioners, the plan calls for development of four or more homes per acre clustered around and in existing urbanized areas and separated by rural spaces. Although advisory only, the plan does provide a clear alternative to continued large-lot residential development at the suburban periphery. However, in a series of reports published in June of 2005, the Ann Arbor News pointed out that new homes continue to be developed in the county with little regard for the plan (Davis 2005).

Under Michigan law, local governments have near exclusive control over development, and are generally not required to follow any county or regional planning effort, so long as they have their own planning and zoning in place. The provisions of the Washtenaw County plan conflict with local zoning regulations in many areas, and a number of local government officials have publicly stated that they have no intention of following the county plan. As Superior Township Supervisor William McFarlane said, there is virtually no chance his township would alter its zoning to comply with the county plan.

> "It's not going to happen," said McFarlane, who for a while last year sat on the county Planning Advisory Board. "We're not going to change our zoning to a higher density to meet the county's plan." The reason, according to McFarlane: Most people don't like high-density housing. "The reality is, for most people, fewer houses is better," [sic] he said (Mulcahy, 2005a).

Changing township land use and development regulations to fit the county plan could be perceived to mean that Superior officials are essentially handing over a slice of the development pie (and the new tax base it represents) to the neighboring city of Ypsilanti. This, in turn, would require significant brownfield redevelopment to accommodate growth within the city. However, there is very little that could persuade township authorities to allow this to happen without the emergence of a sense of greater regional planning and development cooperation. Such isolationist attitudes are rampant across Michigan where local jurisdictions often act with a level of disregard for neighboring communities and for regional development concerns. Further, as witnessed in the Land Use Leadership Council report, the state is rather reluctant to step in to change this situation, except in very limited ways. Home rule and the essentially autonomous local decision making it supports are deeply ingrained in Michigan's political culture.

Thus, Michigan is left playing something of a double hand when it comes to brownfield redevelopment. On one side are state brownfield environmental and redevelopment policies that are touted as significant contributions in the effort to promote cleanup efforts and provide economic stimulation for local communities in need of help in dealing with brownfield sites. Such activities were provided an administrative boost with the informal adoption of canons of "smart growth" by the Michigan Land Use Leadership Council. At the same time, the state has been very reluctant to provide the leadership necessary to limit policies and local attitudes that

support new "greenfield" development and suburban competition to attract growth away from existing urban areas.

Local Policy and Suburban Interests in Michigan

McFarlane, in making such statements as that cited above, is at least partially correct regarding attitudes of Michiganders towards urban development and density. Those with the money to do so have continually shown a preference for newer homes located on large lots at the ever-expending suburban periphery as a more desirable option than living in denser urban environments. Beyond being a matter of racial concern or personal lifestyle preference, large lot suburban housing is also a matter of public policy in Michigan. State enabling legislation insures the right of each local unit of government to plan and zone for itself, and this includes not only every city, but every township as well. As an example, zoning the vast majority of undeveloped land in the seven-county Detroit metropolitan region at densities of one unit per acre or less, and land division into ten-acre parcels results in the very low-density land use pattern that characterizes the suburban edge of the nation's tenth largest regional economy. It also serves to limit the demand for brownfield redevelopment projects, most of which are located in denser urban areas. Few effective alternatives to new sprawling suburban development are provided.

The Michigan Land Use Leadership Council (2003) noted four areas in particular where public policy and legal concerns contributed to a sprawling pattern of growth and discourage redevelopment efforts. They noted that land division and zoning requirements favored large-lot single-family residential development at the urbanized periphery. They also noted that government spending patterns throughout the state encourage so-called greenfield development over the redevelopment of previously built areas. Furthermore, the state-mandated process for clearing land titles in urban areas is so time consuming and cumbersome that it discourages land assembly and redevelopment efforts in urban areas.

Additionally, intergovernmental competition is a serious issue in Michigan where more than 1,800 units of local government have legal authority to engage in land use planning and zoning. Moreover, there is little coordination of planning and development efforts between these units of government. The state has enabling legislation in place to support regional land use planning efforts in the event that two or more local governments might desire to engage in mutual planning efforts, but it is seldom called into play in any but a very limited manner. There is a so-called state coordinated planning act, but it lacks any real teeth, requiring little more than a jurisdiction notify its neighbors and allow for their comment in the event that it undertakes a planning activity. "This lack of coordination across jurisdictions and between governmental entities encourages a checkerboard pattern of development across the state" (MLULC 2003, 17). Brownfield redevelopment efforts simply cannot compete in a significant way with suburban greenfield development, even with the aid offered through the various DNRE programs.

Annexation has been a tool touted for its ability to allow cities to capture a share of suburban growth and the tax revenue it can bring to a community. According to David Rusk, cities with vacant land, and with the political and legal tools to annex new land, tend to be much better off than those that are unwilling or unable to expand their city limits (Rusk 1993). Detroit has been

an "inelastic city" (to use Rusk's terminology) par excellence, having last been able to expand its boundaries in the 1920s. In part, this is a common issue with older industrial cities where suburban communities have grown up relatively early and, through incorporation or other means, have managed to block annexation by their bigger neighbors. This is certainly true for Detroit, but the problem has been exacerbated by the extreme number of minor civil divisions of government and by the support for continuing autonomy that has been granted to these local units in the state constitution and various legislative acts.

Like many others, Michigan is a strong home rule state that has long relied upon local governments to make decisions that primarily are of local concern, including those related to development and to land use planning. State statutes granting this authority to Michigan cities have existed since the early 1900s. Over time, much of this same authority has been extended to townships, making Michigan one of only a few states to grant this level of decision-making power and authority to townships. In Michigan, townships, much like cities, have the authority to make a wide range of decisions related to development, taxation, public service provision, and a host of other issues, even in unincorporated and rural areas. State planning enabling statutes reflect this home rule concept, granting to townships the same authority for autonomous land use and zoning decision making as that typically enjoyed by cities. In rural and other unincorporated areas of Michigan, the counties play little more than an advisory role in shaping development and in creating long-range comprehensive growth plans that can encourage brownfield redevelopment as a critical component of land use strategy.

A Tale of Two Michigans

In the 1990s Michigan set the tone for developing state legislation and programs to deal with a range of brownfield redevelopment issues. There was a clear breaking from the federal CERCLA model that previously guided state remediation efforts, and that gave a high priority to site cleanup with little attention to the potential for redevelopment. Michigan broke from federal precedent by providing strict limits to owner liability, creating more flexible cleanup standards tied to future use of a brownfield site, and creating clear requirements and incentives for redevelopment once the contamination is contained. Yet, it becomes clear in the details and subsequent modifications to these efforts, that the state's overriding concern is for new development over complete site remediation, so long as the public can be isolated from the harmful effects of brownfield contamination. This was made abundantly clear in 2001 when state legislation expanded the definition of a brownfield to include all vacant, abandoned, underutilized, or otherwise blighted properties, irrespective of any real or perceived site contamination.

This emphasis, though, is not all that surprising given the "rustbelt" status of many of the state's communities. Nor is it surprising that under the state's current economic strain (unemployment is currently the highest in the nation and the economic woes of the automobile industry centered in Michigan have been well publicized) that funding for various brownfield redevelopment programs faces an uncertain future. To be sure, some funding will remain, and it is entirely possible that, if and when the state's economy picks up (as it predicted do sometime in the next few years), Michigan voters may again willingly pass another bond measure to support

brownfield remediation and redevelopment, similar to what they did in 1998 with the Clean Michigan Initiative.

In the meantime, the state must figure out what to do with the other Michigan -- the Michigan that has divided itself into small entities of thirty-six square miles (townships) and granted exclusive authority for most land use and development decisions to each of them. The lack of cooperation between the more than 1800 units of municipal government in Michigan, along with numerous state policies and programs, supports new suburban development over the redevelopment of existing communities. DNRE programs to support brownfield redevelopment will only prove very limited in their capacity to level the playing field between redevelopment and new development. The state needs to take a larger lead in encouraging regional cooperation among communities, and particularly among the state's older, built-out communities and the surrounding "greenfield" townships. Such cooperation could go a long way in helping to encourage more brownfield redevelopment when supplemented with on-going support for local remediation efforts.

This issue of regional coordination and cooperation when it comes to brownfield redevelopment is compounded by the conventional wisdom that development at the urban periphery is cheaper, and contributes to a more efficient private market for property development. From a limited economic perspective, a number of studies support this contention (Bartsch et al., 1996; De Sousa, 2000; Simons, 1998). These studies, however, tend to discount the full social costs of suburban sprawl (McCarthy 2002).

A 1996 study of central city versus suburban development in Chicago included the public costs of urban sprawl, such as federal and state highway expenditures; and the social costs of such development, including increased travel distances, air pollution, and open space loss. The authors conclude that:

> deconcentration of development to outer suburban areas brings few or no net gains while presenting significant inequities in the distribution of costs and benefits. Firms locating in outer suburban areas reap most of the benefits, while most of the costs (or benefits foregone) are borne by unemployed city residents, commuters who bear the cost of congestion, accidents and pollution, and taxpayers who foot the bill for subsidies for transportation, home-ownership and other public subsidies (Persky and Wiewel, 1996, p. 1).

Progress has been made in conceptualizing the brownfields problem within the wider context of metropolitan development and suburban sprawl. Several states, including Michigan, consider brownfield redevelopment as a smart growth option (Greenberg et al. 2001). While such a shift represents a significant step forward, there still needs to be more fundamental change in federal, state, and local policy and spending. The benefits of development need to be better shared throughout metropolitan regions as a whole. The development balance between greenfields and brownfields must be equalized, or even tilted in favor of brownfield redevelopment. As McCarthy concludes:

> While recognizing the futility of calls for a new metropolitan layer of government in politically fragmented US metropolitan regions, the new regionalism movement's concern for central city–suburban interdependencies and the co-ordination of programs that have a regional impact, may offer insights for devising innovative brownfield reuse/greenfield preservation policies (McCarthy, 2002).

The importance of all of this as it relates to brownfield redevelopment success is tied to the understanding that what many of the DNRE programs are attempting to do is to level the playing field, so to speak; to make brownfield redevelopment more attractive to developers who may be more interested in new development projects at the suburban edge and beyond. The DNRE approach, however, is primarily limited to the economic area. These programs provide funding for various environmental assessment and remediation activities in an effort to make brownfield sites more financially attractive to developers, be they private or public sector operators. This approach unfortunately tends to ignore the broader policy and political economy issues outlined above. It also may lead to increased competition among local jurisdictions as brownfield sites become more attractive to developers, adding to the stock of properties from which developers choose within any given area.

There has been some progress made in Michigan along the lines that McCarthy (2002) and others suggest above. The Land Use Leadership Council report (2003) sets the tone for this with its adoption of Smart Growth principles. What needs to happen though, is for the state to seriously implement these principles, and to develop the sorts of approaches that are seen in other states such as Oregon, Florida, Maryland, and Washington in developing capacity for regional cooperation among competing local jurisdictions. As stated previously (and it bears repeating), the state should take the lead in encouraging regional cooperation among communities, and particularly among older, built-out communities and the surrounding "greenfield" townships. Such cooperation could go a long way in helping to encourage more brownfield redevelopment when supplemented with on-going support for local remediation efforts such as that offered by DNRE and other agencies.

Public Benefits of Brownfield Redevelopment

The issue of how to define and evaluate the benefits of brownfield redevelopment projects is key to developing successful policies to support actual redevelopment efforts. However, the issue of proper evaluation is difficult, not because of a lack of studies in this area, but because a standardized methodology to assess public benefits has been little tested. Nevertheless, there are a growing number of studies being done in this arena, both as case studies of individual sites or sets of actual projects, and as analyses of specific assessment mechanisms.

Assessing the benefits of brownfield redevelopment is complicated. Projects vary greatly in their redevelopment objectives, extent of public sector involvement, and character of environmental contamination. Furthermore, state and local initiatives to promote brownfields differ widely across the US. Given such variation, is there a standard set of metrics than can be used to measure the public benefits of brownfield redevelopment? This question is further complicated

because the evaluative metrics chosen imply particular definitions of the goals of a project and, therefore, of the character of "success."

In the case of brownfield redevelopment, different stakeholders can have very distinct goals. Private, for-profit real estate developers involved in brownfield redevelopment define successful brownfield projects in terms of acceptable profit given the level of risk involved. Cities have a different perspective. For example, the President of the U.S. Conference of Mayors speaks about successful brownfield redevelopment in terms of economic vitality, the utilization of existing infrastructure such as roads and public utilities, and easing the pressure to develop open spaces and farmland (US Conference of Mayors 2000; 2008). Community groups and environmental activists have a different focus. For example, the Center for Public Environmental Oversight 1998) has insisted that a number of social justice concerns be addressed with brownfield redevelopment, and that those most directly impacted by the redevelopment effort define its success, rather than leaving it up to project proponents.

Despite the difficulties in measurement due to varied project types and goals, there have been efforts to evaluate the benefits of brownfield redevelopment. However, most of these studies have generally taken either a purely qualitative approach or a narrowly defined quantitative approach to measuring benefits.

Numerous case studies have been and continue to be written about brownfield redevelopment (Dennison 1998, Simons 1998a, Bartsch and Collaton 1997, Pepper 1997, Meyer 2007). Generally these case studies include a qualitative description of the benefits of the project. These descriptions vary by case, and are not organized into any standard or consistent format.

Several quantitative studies have been conducted to measure the benefits of brownfield redevelopment, but these indicators of benefit are relatively narrow, compared to the full range of possible benefits identified in the qualitative studies discussed above. For example, the Federal EPA estimates that its brownfield program has helped create more than 61,000 jobs across the country and leverages $18.68 of additional investment for every federal dollar spent on brownfield redevelopment (US EPA 2010).

The U.S. Conference of Mayors regularly conducts a survey of US cities with regard to their brownfield properties and found that cities reported that redeveloping their brownfields would collectively result in between $1.3 billion and $3.8 billion in additional annual tax revenues, 550,000 new jobs, and capacity for 5.8 million new people in the cities without adding new infrastructure. (U.S. Conference of Mayors 2006, 2008). The Conference of Mayors also found that tax base growth, followed by job creation and neighborhood revitalization, were among the most commonly expected benefits of brownfield redevelopment. Neither the EPA study nor the U.S. Conference of Mayors survey show how their assessment measures could be normalized to enable project-by-project comparisons of project benefits. Rather, they aggregate these benefits across a plethora of projects, suggesting the potential benefits of brownfield redevelopment on a broad, national scale. However, these assessments do little to explore project benefits at the local level.

A more detailed project-level study on the benefits of brownfield redevelopment was published by the Council for Urban Economic Development (CUED, now the International Economic Development Council), in 1999. CUED's explicit goal was to focus on the economic development impacts of brownfield redevelopment. The authors developed two benchmarks (i.e. discrete, measurable elements) to evaluate a broad variety of projects in terms of their economic benefit. The authors argue that these benchmarks are powerful in that they can be used to measure the impact of a wide variety of projects, and that they are relatively simple to compute and understand. CUED measured public cost per job created in each project and private sector funds leveraged per dollar of public investment for each project. The authors concluded that the median public cost per job created was $14,003, and that the median leverage for a typical project was $2.48. However, the CUED study measures only a very limited aspect of public benefit that can be realized from brownfield redevelopment, and there are any number of issues related to their two benchmark concerns. In our case study efforts, for instance, we found it very difficulty to get accurate information related to job creations resulting from redevelopment efforts, as well as verifiable information on the exact amount of private investment.

A report published jointly by the Center for Public Environmental Oversight (CPEO) and the Urban Habitat Program (UHP) in 1998 stressed that the most common measures of public benefit from brownfield projects can neglect the impact of a project on the local neighborhood. The understanding of successful brownfield redevelopment is most typically defined by government agencies as the number of jobs created, the amount of private investment leveraged, and the new tax revenue created. However, redevelopment assessment using these simple metrics are not able to show that a project provided benefits to those who were negatively affected by the brownfield property. Environmental justice and community advocates argue that evaluations of brownfield projects should measure the benefits that the project provides to the local community, not just project proponents. "Success cannot be merely defined in terms of dollars and cents. Rather it should be judged by the effectiveness of a community's ability to drive and benefit from the redevelopment process" (CPEO and UHP cited in Dyke 2000, 68).

CPEO executive Lenny Siegel has suggested that brownfield projects requiring public subsidies be evaluated across a number of metrics (Siegel 2001). Proposals for brownfield redevelopment projects requesting public investment should be evaluated on the extent to which each project would:

- involve the local community in planning
- protect public health
- generate local jobs and business
- provide needed services or housing for the community
- expand open space or otherwise improve the local quality of life
- generate additional tax revenues for local agencies
- retain the existing community and its cultural base
- provide any of the above in a particularly blighted area

To date there is no generally accepted method for evaluating this broader class of public benefits of brownfield redevelopment. CUED's rationale for focusing solely on economic development impacts may be indicative of the general reluctance to quantify the spectrum of public benefits

created by brownfield redevelopment. CUED considered environmental and social dimensions of brownfield redevelopment to be more difficult to measure than economic impacts. Further, CUED notes that economic development is often cited as a primary goal of brownfield redevelopment. Data on economic benefits are often used by legislators and policy makers as a basis for allocating funding between projects and for measuring project success. Finally, as CUED states, "economic statistics are often seen as more rigorous than qualitative measures, which are often discounted as mere subjective pronouncements." Although CUED did briefly describe environmental and social benefits of the projects, there was no standardized method of evaluating these benefits (CUED 1999).

While this rationale for limiting its project scope is understandable, there is a need for additional quantifiable benchmarks that address additional dimensions of brownfield redevelopment along the lines suggested by Siegel (2001; 2008). Meaningful assessment of brownfield redevelopment projects must reflect the primary goals and desired outcomes of a brownfield program. While job creation and leveraging private investment are primary goals in many projects, other projects have primarily social or environmental goals, or focus on other dimensions of economic benefit, such as increasing utilization of existing infrastructure or providing jobs specifically to local residents.

Brownfield policies are often relatively new, experimental, and constantly evolving. Many federal and state brownfield programs have been in existence only for relatively few years, and those programs that have been in existence for longer periods are often impacted and changed by new policies and mandates. The wide variety of approaches to establishing incentives for redevelopment reflects the experimental nature of these policies: each jurisdiction is, in effect, a test case. The most successful approaches only become evident as more projects are completed. Therefore, it is important to monitor the success of brownfield projects and policies in order to provide a feedback mechanism for policy evaluation and improvement. One way to monitor the success of brownfield policies is to develop standardized metrics that reflect the broad array of public benefits that are used as the rationale for promoting brownfield redevelopment. Metrics that can be applied across state boundaries could enable a comprehensive evaluation of the success of brownfield policies, both individually and as a collective, in making progress toward explicit local, state, and federal policy objectives.

Michigan Brownfield Redevelopment Innovation:

The Brownfield Redevelopment Case Study Research Project

Bay City's Saginaw River central waterfront has been cleared with over $3 million in support from DNRE's Waterfront Redevelopment Grant Program. Actual redevelopment, however, awaits in some distant future.

Case Study Methodology

Researchers from both Eastern Michigan University and DNRE conducted detailed case studies of 55 brownfield redevelopment sites representing 62 DNRE projects throughout the State of Michigan (Figure 2). (A listing of the 55 case study sites is found in Appendix B.) These projects have been selected from among the 365 projects for which the state has provided funding support for brownfield assessment, remediation, and due care activities from the five 1988 and 1998 bond-supported programs and the revolving loan program. Per requirements of the six grant and loan programs, state support requires that the fund recipients demonstrate the redevelopment potential the remediated sites. Of the studied projects, nine are currently undergoing an active redevelopment effort, and have completed most, if not all, of their remediation activities. They have undergone sufficient redevelopment to indicate a strong likelihood of successful completion. Another seven brownfield projects are considered delayed in their remediation and/or redevelopment effort such that little, if any, redevelopment effort is evident at the sites. The remaining 39 sites have successfully completed or substantially completed all remediation and redevelopment work.

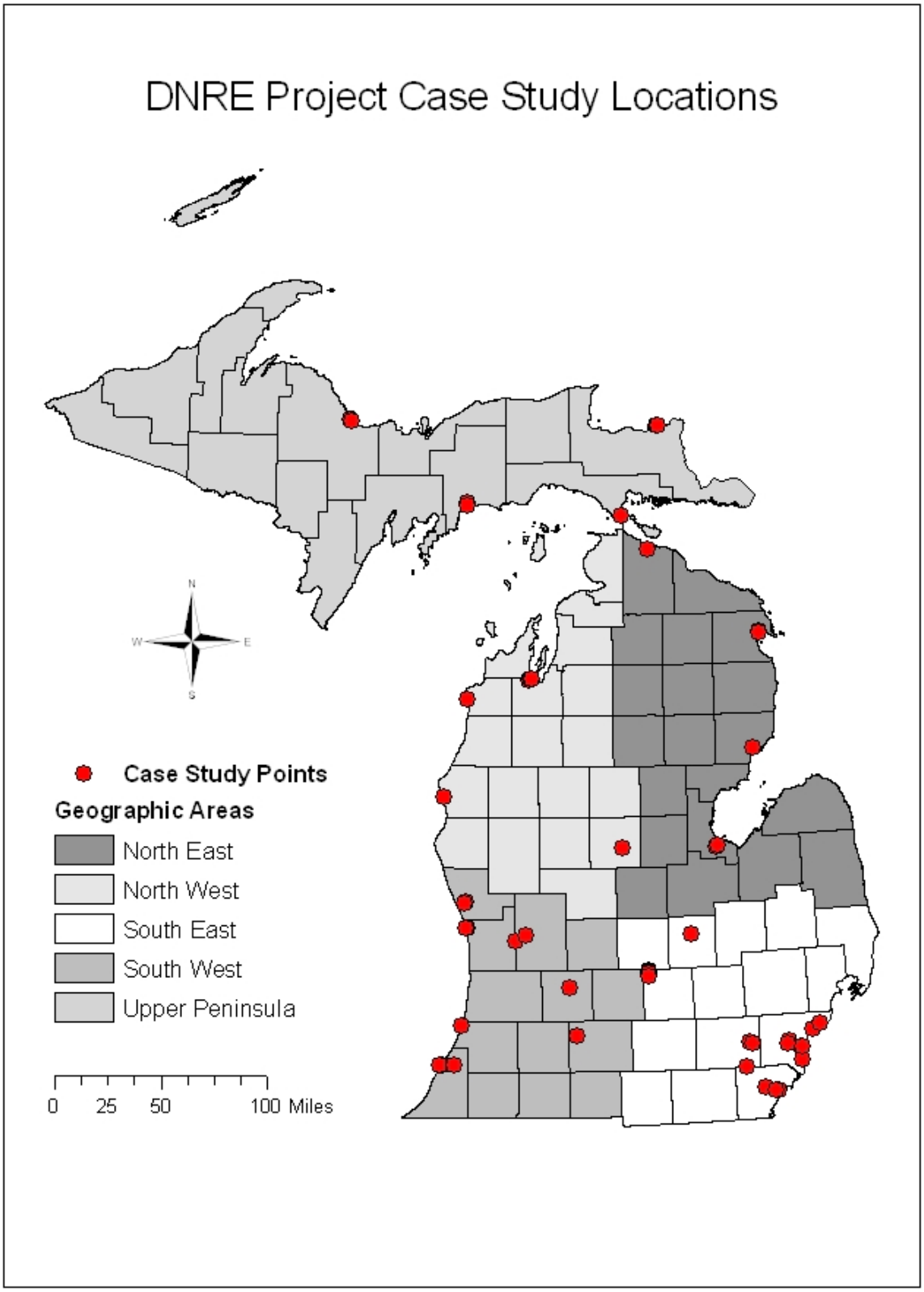


Figure 2. Locations of brownfield case study projects.

The project research team used an iterative, non-linear case study approach to examine the successful redevelopment of brownfield sites in coastal areas of Michigan. Coastal Michigan within approximately one mile of the coast was selected due to the mission of the funding authority, Michigan Sea Grant. However, with additional staff and intern support from DNRE, the research team was able include 16 projects located in communities away from the coastal areas of the state. Projects were selected based on knowledge of DNRE staff, with no attempt to randomize selection from the approximately 365 projects that received funding from the six DNRE programs of interest. Further, no attempt was made to isolate and assess the direct impact of coastal proximity to redevelopment project success.

Although the non-randomized, a priori selection of projects does place limits on the validity and generalizability of the study in a number of respects, it is important to keep in mind that the intent of this research effort is to examine successful redevelopment projects in order to elicit general commonalities among them. From this perspective, randomized selection of projects is less critical.

St. Anne's Gate in Detroit is a successful residential development on former industrial and commercial properties and a significant contribution to the emerging vitality of the Mexican Town neighborhood located near the center of Detroit. The project received an $808,000 Site Reclamation Grant from DNRE to assist with assessment and remediation efforts.

As to the issue of how successful projects were defined in selecting the study sites, the project research team took a very broad definition of success that was based primarily on whether or not any redevelopment had occurred. We also looked at how closely the redevelopment effort compared with the plans and descriptions that were included as part of the original DNRE funding application process.

The 62 projects at 55 different locations in 31 communities around the state represent approximately 17 percent of all projects that received funding from the six DNRE brownfield redevelopment programs. The $54.3 million granted for these projects represents approximately 35 percent of the total funding allocated to the six programs. These case study projects would seem to have received a somewhat disproportionate amount of state funding, at least in terms of the number of projects. It would be dangerous to conclude from this, though, that greater state funding is important in insuring project redevelopment success. In fact, two of the projects that received the most DNRE funding have as yet to show any redevelopment (the Bay City Waterfront project at $3 million, and the Water Street project at $4.7 million).

In evaluating brownfield redevelopment success in Michigan, the case study projects were assessed across several different impact areas:

- environmental site remediation prior to redevelopment
- environmental impacts of the actual redevelopment project
- economic and fiscal impacts
- social and community development impacts

Specific metrics for each of these areas were further developed through discussions among the research team, DNRE staff, and Michigan Sea Grant staff.

Thus, to evaluate environmental remediation impacts the project team looked at the area that is cleaned, the type and amount of remediation work that is required, the remediation standard that is applied (residential, commercial, or industrial), and whether or not on-going "due care" activities are required. Much of this type of information is contained in the DNRE project records, and was also checked with field observations. Follow-up interviews are also conducted with local officials, project managers, and environmental consultants advising on the projects. (See Appendix A for the project evaluation instrument used in collecting case study data for this study.)

The draft evaluation instrument was tested on several projects -- Mulberry Place (single family detached residential project in Wyandotte), St. Anne's Gate (single and multifamily residential project in Detroit), Grosse Ile Airport and Commerce Park (commercial and municipal facilities in Grosse Ile Township), Rouge River Oxbow Restoration (natural area restoration and educational facility in Dearborn) Mason Run (large single family detached housing development in Monroe), and the River Raisin Battlefield (national park site in Monroe).

This preliminary assessment was used to:

- familiarize investigators with DNRE projects and processes;
- assess location, availability and accessibility of information for each project;
- evaluate and refine the redevelopment project evaluation instrument;
- determine what could be done through archival record review, through field study, through analysis of relevant local documents, and through key informant interviews;
- and assess what gaps there might be in the available project information, and how those gaps might best be filled.

In the end, the evaluation of each project included the following to address the metrics in the project assessment instrument:

- archival review of DNRE files located in Lansing and field offices, which included review of grant/loan application files, baseline assessment materials, Phase I and Phase II environmental assessment reports, and other project information
- preliminary and follow-up field investigations to assess current project status and evaluate surrounding conditions

- GIS analysis as appropriate to each individual site, and analysis of existing cartographic and photographic information of the project site and surrounding area
- content analysis of local planning, development, and documents related to project, including newspaper and other media stories, public outreach materials, project advertising, and the like
- key informant interviews as needed to complete brownfield redevelopment project evaluation instrument and to provide additional insight into project issues

Information for each of the 55 case study sites was compiled into a database and subjected to basic comparative analyses (Table 2). The 39 successful projects were compared to nine projects currently undergoing redevelopment, and to the seven projects that had seen little or no remediation and redevelopment activity. There were marked and significant differences between projects that had successfully been redeveloped and those that had not. This is hardly surprising, however, in that assessment tool was indented to provide metrics for evaluation of successful (rather than unsuccessful) projects.

Redeveloped Land Use Type	**Geographic Area of Michigan**					**Number with each redevelopment land use**
	Southeast	Southwest	Northeast	Northwest	Upper Peninsula	
Commercial	5	7	3	3	3	**21**
Residential	6	3	1	5	2	**17**
Recreational, park, or coastal access	5	3	6	4	4	**22**
Industrial	2	6	0	0	3	**11**
Public building (municipal offices, library, etc.)	1	2	1	0	0	**4**
Not redeveloped	1	2	3	1	0	**7**
Number in each Area	**17**	**15**	**7**	**10**	**6**	

Table 2. Number of case study project redevelopment land use types in various geographic areas of Michigan. Geographic areas and project locations are shown in Figure 2. (Note: mixed-use redevelopment projects have been broken out into their various constituent land use types for this table.)

Once the site of the original Frenchtown settlement and the location of an important battle in the War of 1812, this site was home to a paper and cardboard manufacturing facility from 1910 to 1997. The site was donated to the City of Monroe, MI, and subsequently has been designated as the River Raisin National Battlefield. The National Park Service is currently developing a parks management plan for the site, which will become a significant tourist attraction in Southeast Michigan. The project received a $1 million Brownfield redevelopment Grant to aid in final demolition and clean up efforts. (Photo is before final demolition and clean up of the site.)

Assessing Brownfield Redevelopment Success

From a legislative standpoint, Michigan has thus far chosen to keep things rather simple in assessing brownfield redevelopment, concerning itself primarily with the amount of land that has been remediated, the amount of private investment that has been leveraged for both remediation and redevelopment activities, the number of new housing units constructed in the case of residential redevelopment, or the number of new jobs created in the case of commercial and industrial redevelopment projects. Although these measures are not trivial, they are clearly not enough. For instance, a brownfield property cleaned and redeveloped as a park or other public open space would certainly contribute to the amount of remediated land in a community, but there would likely be little direct private investment leveraged. The project would contribute few new jobs or housing units, and there would be little direct contribution to local fiscal resources. Yet, the social benefits could be tremendous, as would the indirect benefits for adjacent neighborhoods, and if properly planned, the project could spur other local development efforts.

The relative level of successfulness for a brownfield redevelopment project is not easy to identify. The literature on this topic is growing, but is still far from complete. The efforts to date may generally be divided into two broad categories. The first of these primarily consists of case studies of brownfield redevelopment projects, either individually or as a collection of projects within a given community or other geographic area. From these cases, discussions of relative success ensue, often leading to conclusions that identify key components or actions that made the project successful (Mohamed and Dancik 2007; Regional Analytics 2002; Wernstedt et al 2004; Zavadskas and Antucheviciene 2006).

A second category of study proceeds to argue for a predetermined set of measures for success that can subsequently be applied to brownfield redevelopment projects. These studies may range from discussion of a single metric such as property value (Bacot and Odell 2006) to multiple

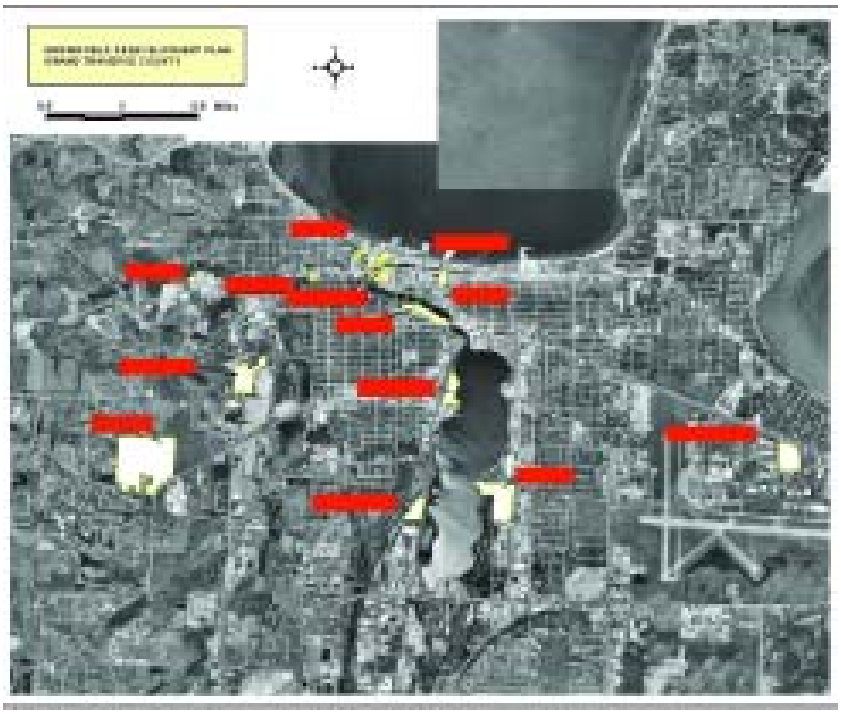
metrics that often seem to evolve around the concept of a "triple bottom line" (examining environmental, economic and social concerns) borrowed from discussions of sustainability (Lange and McNeil 2004; Pediaditi et al 2006; Wedding and Crawford-Brown 2007; Paull 2008). It is this later discussion that most influenced the current research effort. However, this triple bottom line approach was somewhat modified.

In addition to examination of the environmental benefits realized from remediation activities, the environmental impacts of the redevelopment effort were examined in an effort to determine what sorts of environmental benefits are realized beyond any remediation activity (Table 3). The redevelopment land use type was evaluated for its potential for environmental pollution. Impacts in such areas as storm water management, groundwater protection, and buffering from environmentally sensitive areas were also examined. Project compatibility with adjacent developed and natural areas was reviewed. Each project was also checked for participation in established "green" programs such as the federal Energy Star program or Leadership in Energy and Environmental Design (LEED). This information was gathered through site evaluations and the study of redevelopment plans. Interviews with developers and local planning authorities were also useful in understanding how various redevelopment projects impact the environment after the brownfield remediation effort was completed.

From the standpoint of economic impacts there are employment gains, leveraged investment, and revitalized neighborhoods to be considered. Connections between the redevelopment project and larger regional, state, and global economies can also be significant. Often, though, it is rather difficult to assess the economic impact of a brownfield redevelopment project as such impacts are closely intertwined with other economic development programs and with other nearby redevelopment projects. In Michigan, brownfield redevelopment is frequently undertaken in concert with a variety of other economic development programs such as state renaissance zones, so-called Cool Cities (a state program inspired by the work of Richard Florida) projects, enterprise zones, and others. Further, brownfield redevelopment projects are also incorporated into general local revitalization efforts, representing but one significant piece of a much larger puzzle.

The fiscal aspect of brownfield redevelopment projects includes such concerns as the generation of new sources of local revenue derived from previously unproductive land. Brownfield redevelopment is also said to lower requirements for municipal investment in infrastructure to accommodate growth due to the reuse of existing infrastructure or because brownfield redevelopment projects tend to provide more compact forms of development than do greenfield projects at the urban periphery. As with other economic impacts, the picture here is rather cloudy. Most of the brownfield projects we assessed have incorporated some form of tax credit or other incentive program, or are part of a brownfield redevelopment tax increment financing district. This means that local communities often realize only small direct gains in local tax benefits from brownfield redevelopment, at least in the short term. Further, many brownfield redevelopment projects are publically held, and are therefore exempt from local property taxes. Nevertheless, fiscal benefit is derived from the spillover effects of new jobs within a community with accompanying new personal and business revenues, and from the potential for increase in the value of properties adjacent to the redevelopment site.

The community development impacts of brownfield redevelopment include providing space for government and social service activities, development of new affordable housing units, creation of living wage jobs, and new business generation. Also assessed is whether or not existing support structures such as public transportation are adequate to meet the needs of redevelopment projects. These measures are evaluated within the broader context of general community needs and desires as reflected in community master plans, housing plans, and parks and recreation plans. Community development leaders are also identified and interviewed as to how they feel brownfield redevelopment projects impact the services they provide.



Traverse City has become one of the top tourist destinations in Michigan thanks in no small part to more than a dozen successful brownfield redevelopment projects that have helped clean up Boardman Lake and establish public access to its downtown waterfront area. The effort has also led to the revitalization of several historic structures.

Similar evaluation of community plans and goals and interviews with community leaders was used to examine the social impacts of the redevelopment projects (Table 3). Public participation in the brownfield redevelopment process was assessed, as was the provision of public amenities such as parks and open space, waterfront access, and community center facilities, all of which are significant aspects of a variety of brownfield redevelopment projects in Michigan.

Brownfield Redevelopment Benefits	Number of Projects
Environmental Benefits	
contamination removed/site remediated	37
protection of adjacent natural resources	12
on-going assessment and monitoring activities	9
"green" or more sustainable development	9
on-going groundwater treatment	5
improve/protect public health	4
Social Benefits	
improvement to neighboring properties and businesses	17
improved/increased waterfront access	12
overall quality of life improvement	10
additional/improved public space and facilities	9
downtown improvement	9
new/improved recreational opportunities	8
new market rate housing to meet community needs	6
historic preservation	6
reuse existing infrastructure	6
blight mitigation	5
new affordable and special use (e.g. senior) housing	5
Economic Benefits	
new jobs brought to community	15
broader/increased tax base	14
increased property values	9
leveraging of private development funds	7
leveraging of other (non-DNRE and local) public funds	6
increased municipal funds	5
improved development capacity	5
promote local tourism	5
maintain existing jobs	4

Table 3. Most frequently mentioned benefits derived from brownfield redevelopment efforts based on interviews, site observations, and media accounts. Numbers indicate the number of different redevelopment projects for which the listed benefit was indicated.

Factors Enabling Success

Analysis of these 62 DNRE projects at 55 sites indicates that the successful redevelopment projects do have some broad characteristics in common. First, although some smaller projects such as the Tawas City project and the Alpena Riverfront project have impact primarily within their immediate community, most successful projects recognize some importance for making broader regional, state, and even global connections. The economic success of projects often must depend on financing from outside the local area, and even from outside the state. Businesses such as the Whirlpool Corporation, Edgewater Automation (a developer of custom automated manufacturing equipment), and R&B Electronics, all benefiting from the state's brownfield redevelopment programs, are dependent on doing business in a global environment far outside the confines of Michigan. Even residential developers realize the impact carried by homebuyers from outside the state. Many successful residential brownfield redevelopment projects, particularly in Michigan's coastal areas, include "second home" units and associated recreational facilities such as marinas that are marketed to potential buyers in places such as the Chicago and Toronto metropolitan areas. Places such as Traverse City, Marquette, and Ludington have taken advantage of such "outside" capital; and the revitalization of Benton Harbor is absolutely dependent upon it.

A second feature common to a number of successful projects is a degree of regional planning cooperation, a remarkable feature within the political context of Michigan planning and development. As noted at the outset, Michigan is a strong home rule state with a penchant for extending property rights as far as is practical. It is also a state that has divided its unincorporated areas into townships, and given those townships opportunity for an extraordinary level of autonomy through a chartering process. All of this has led to notable levels of local competition when it comes to attracting development dollars, and a distinct lack of cooperation when it comes to urban planning (Michigan Land Use Leadership Council 2003).

Yet, brownfield redevelopment efforts do not seem to have quite the same localized character. A great number of Brownfield Redevelopment Authorities operate at the county level, rather than the local level, and in cases when county and municipal BRAs overlap, there seems to be a far greater level of cooperation than competition. Perhaps most remarkable is the Harbor Shores redevelopment project in Benton Harbor where the Cities of Benton Harbor and St. Joseph, Benton Charter Township, and Berrien County have all entered into a cooperative agreement for the remediation and redevelopment of about 570 acres of brownfield sites that will bring tremendous economic and community development benefit to the entire region.

A third common element in successful brownfield redevelopment is the development of a vision for redevelopment. It is clear that a basic remediation strategy to clean a site and make it ready for redevelopment is not enough. Even prior to the current economic recession, projects that did not have a definite and clear plan for redevelopment had a hard time attracting developers. A plan that is grounded in current conditions, but which looks forward five, ten, and even twenty years must be in place, and it must enjoy a significant level of community support.

The Mason Run project in Monroe, Michigan, clearly illustrates this. Located on a site once occupied by a large paper mill, the city saw a clear need to develop single-family housing at this

location less than a mile from the downtown core. Further, the city identified the need for a significant amount of housing that would be suitable for households earning above the median income for the area -- a need created by new development at the nearby industrial park and other remediated brownfield sites in the city. Working with its citizens, the city crafted a plan for redevelopment and located a developer that shared the vision of the plan. As a result, the city is realizing a new neighborhood of family homes that fits well within the context of existing homes, wetland areas, and recreational facilities. Currently about half complete and somewhat slowed by the current slump in the housing market, the developer and community are looking forward to completion of the approximately 300 homes over the next ten years that will be Monroe's newest neighborhood.

Mason Run, a new residential neighborhood in Monroe, MI, was once the home of a large paper mill operated by the Consolidated Packaging Company until the mid 1970s. The site was purchased by the City of Monroe for $10.00 at a bankruptcy sale. Located less than a mile from downtown Monroe, the site is being redeveloped using principles of "new urbanism." This project has received $2.8 million in grants and loans from DNRE.

Relatedly, the vision for redevelopment must be holistic and complete. It is not enough to begin a plan and look to complete it at some indefinite future point in time. The Saginaw Riverfront in Bay City, Michigan, provides an illustration. A plan to consolidate several brownfield properties along the river near downtown was developed in the late 1990s, but the plan was incomplete in its consideration of the actual redevelopment for these properties. Where specific projects were identified, such as a new hotel and conference center, redevelopment has been very successful. In other areas of the riverfront where actual projects still have not been identified, land sits cleared and ready, but redevelopment has not happened. In yet other areas, remediation efforts were never completed, awaiting some uncertain future There are dreams that some sort of tourism attraction might happen, but the overall vision remains unclear and the plan incomplete.

Ypsilanti's Water Street project provides another example of an incomplete and ungrounded vision. Over the past decade the city has had at least two developers interested in the project, but the parties have not been able to agree on a vision and practical development scheme that is implementable. In the meantime, citizens of Ypsilanti have lost their enthusiasm for the project and the city leaders are at a loss as to what might be done to redevelop the approximately 38 acre site.

Although it may seem obvious, it is imperative that the developer for each project, whatever it may be, not be over-extended in terms of financial backing and capacity to complete the project within a reasonable time frame. Certainly problems associated with the current housing slump and general economic decline in the state have adversely impacted many brownfield redevelopment efforts. However, a number of successful projects have been started or are continuing through the depressed economic climate of the state. Certainly work on these projects has been slowed, particularly for residential projects. But the homes continue to move as developers have the resources to continue construction. According to one real estate broker working on sales in Ludington's waterfront redevelopment area, his sales have slowed from about 35 residential units per year to about 20, but the demand is still there as long as developers can complete the projects.

This has not been the case for the Riverview Condominium project near downtown Alpena. Plans for development of this multi-story residential project with associated public river walk and marina facility. As the Michigan economy and the market for residential development cooled, the developer found himself over-extended with other projects in the city and surrounding area. The decision was made to abandon the downtown project in favor of single-family residential development at the edge of town. The Riverview site currently sits vacant and for sale, with little chance of redevelopment in the foreseeable future.

Site of the Riverview Condominium project near downtown Alpena. Although the site was cleared and remediated, all that was constructed was this sign and a web site before the developer abandoned the project and put the property up for sale

Strong project leadership is important, both for remediation activities and for redevelopment. For most of the case study projects examined so far, a clear project leader has been identified. That leader may be an individual or group, a non-profit entity, a city council and staff, or whomever, so long as they are willing to take on the role of project "champion." It is inevitable that a brownfield redevelopment project encounter bumps along the road to successful completion. New areas of contamination are uncovered as redevelopment proceeds, remediation ends up costing far more than expected, the developer decides to add additional residential units on an area that was only remediated to commercial standards, commercial rentals and residential sales slow because of uncontrollable economic conditions -- the list goes on. What is important is that some one, or group, or other entity is convinced of the environmental, social, and

economic benefits of the project to the point where they can steer it through all the unanticipated problems towards successful completion.

The abandoned manufacturing facilities of the Star Watch Case Company (above) have been transformed into condominiums and new marina (left), one of several projects that are remaking the downtown waterfront area of Ludington.

In many instances this leadership role is played by a broad coalition of civic leaders, business interests and elected officials. In Monroe, for instance, local officials and city staff teamed with the right developer to champion the Mason Run project, as well as the development of a townhouse project at the former Monroe Steel Casting facility. City officials and staff have also worked closely with the property owner and particularly with members of the Michigan congressional delegation to move the River Raisin Battlefield project closer to fruition. Rep. John Dingell has been particularly instrumental in this effort.

In Ludington local officials have worked closely with downtown business interests in creating a coalition in the 1990s to redevelop the central waterfront area with new residential projects, recreational facilities, including public park space and marinas, and new businesses. A decade later this has led to a vibrant downtown community that is remaking the Ludington waterfront.

Led by the Whirlpool Corporation and Foundation, the Harbor Shores project has brought civic leadership and the non-profit community development sector in support of this massive effort to restore the Benton Harbor area to a once again thriving community. Although this project is only fairly recently underway, this broad coalition of project supporters and funders is working diligently to fulfill the vision of a new Benton Harbor.

Finally, successful projects have all garnered and effectively utilized public support for brownfield redevelopment. Project leaders hold a clear understanding that community support can be one of the most important assets in promoting and implementing brownfield redevelopment efforts. Further, it is important that the public be involved from the outset of the project in order to counter the perception that decisions have already been made and deals cut. Even this, however, is no guarantee that community residents will not stand in opposition to key aspects of a redevelopment project.

The Harbor Shores project in Benton Harbor provides an illustration of this. A significant component of the redevelopment effort involves creation of a signature public golf course, part of which occupies what was once a little utilized and run down portion of a public beachfront park. The developers had addressed this issue early in their planning process, and had elicited general public support for this part of the project with agreements for beach access improvements, long-term contributions to park maintenance, and public access to an interconnected system of trails and bikeways throughout the 570 acre redevelopment area. This early public involvement proved effective at quieting later opposition from a contingent of park neighborhood activists opposed to the scope of the redevelopment project, illustrating the importance of both strong project leadership and the engagement of the public in the redevelopment process.

The City of Marquette has long been interested in redevelopment of a number of its former industrial waterfront sites, including the South Rail Yards. Civic officials engaged the public in discussions of what might be done with some of these vacant sites, but initially it proved difficult to get anything started from a redevelopment perspective. Finally the city decided to start small, developing several projects such as public right of ways and a park along the shoreline to provide access to the emerging recreational waterfront. The popularity of these facilities helped make the public aware of what needed to be done with the South Rail Yard facility and other sites. According to civic officials as well as users of the waterfront access system, this support has been critical in the on-going effort to redevelop the area with a combination of residential and commercial uses, in addition to the recreational facilities.

The Rosewood Walkway is part of Marquette's effort to redevelop its former industrial waterfront. The public walkway connects the downtown area with the waterfront through the vacated rail facilities. Extension of the Walkway along Lakeshore Blvd as well as redevelopment of the rail yard has been aided by over $1.2 million from DNRE.

Michigan Brownfield Redevelopment Policy Concerns

Examination of the six DNRE brownfield redevelopment programs clearly shows that Michigan state initiatives in this area have certainly been instrumental in generating community reinvestment, as well as in aiding with clean up of environmental contamination (Table 3). These programs, and the policies that support them, have been successful in generating developer interest in brownfield properties through the overall reduction of private sector costs associated with brownfield sites. Further, such projects have had a positive impact on the surrounding areas, if for no other reason than the community has eliminated what is most often a

non-productive and blighted property (Hula 2002a). However, researchers working nearly a decade ago found that although brownfield redevelopment projects brought certain economic improvements to a community, "no case was found where an initial brownfield investment plausibly lead to a significant secondary development as predicted by brownfield renewal enthusiasts." The author goes on to explain that at least part of the issue may be the relatively small amount of time that had elapsed between implementation of Michigan's CMI programs and the projects that were assessed (Hula, 2002b).

This may very well have been the case as our research reveals a number of cases where an initial brownfield redevelopment project has provided catalyst for other redevelopment efforts in the surrounding area. The remediation of the former Ausco foundry site in St. Joseph and its redevelopment as the Edgewater commercial park has directly spurred investment in other commercial, as well as retail and residential projects in the immediately adjacent area. Nearby, Benton Harbor's project has expanded to include a massive community development effort that has thus far led to numerous jobs training programs, after school programs, the development of approximately 400 units of affordable housing, and downtown revitalization.

Similar conclusions may be reached even for very small projects such as in Tawas City. There a small state investment in a riverfront improvement project, together with construction of a new city hall, has directly encouraged redevelopment of adjacent property, with plans to eventually reconstruct the small downtown area. Projects in Ludington and Marquette, St. Anne's Gate in Detroit, and others have all help to spur investments in surrounding areas.

Other communities, however, have not been so successful. Although state supported projects such as the Alpena Riverfront Area revitalization and the Doubletree Hotel and Conference Center in Bay City have been outstanding projects in and of themselves, they have not, thus far, directly stimulated significant levels of other new development in their communities. Part of the issue, as Hula (2002b) points out, is that such direct connections are notoriously difficult to demonstrate conclusively. More significant, though, is the amount of time that is involved. As indicated in any number of the case studies, successful projects require that communities be engaged in the redevelopment effort for the long haul. It can be a decade or more before the full benefits of brownfield revitalization come to fruition. Further, the general economic climate in Michigan over the past few years clearly clouds the picture and has undoubtedly delayed a wide variety of community reinvestment projects, not just brownfield redevelopment. The state, as well as local communities, must be prepared to wait out the apparent lack of progress in many as yet unsuccessful brownfield projects as it is likely that many positive impacts will not be measurable in the near term.

A focus on leveraging private sector investment in Michigan makes it difficult for municipal leaders to develop and implement a broad community development plan when it comes to brownfield redevelopment. Too often there is a tendency to focus on the individual project with little attention paid to wider, collective concerns. However, it is clear that having a well-thought and articulated development plan is an important factor in the success of brownfield redevelopment efforts that we have studied. Some of the case study communities, such has Ludington, Monroe, and Traverse City have embedded their brownfield plans within their local comprehensive planning efforts and municipal zoning ordinances. Others such as Marquette and

St. Joseph have opted to create brownfield plans and related implementation mechanisms coordinated with, but independent from, other local comprehensive planning and land use regulation efforts.

The role of Brownfield Redevelopment Authorities is interesting in this regard. State statutes require that a development plan be in place for these entities to operate. However, the BRA is primarily a fiscal authority, and the plans it prepares are redevelopment financing plans, not more comprehensive community development plans that consider a full range of social and economic concerns, as well as development impacts. Moreover, we heard in numerous interviews of developers and municipal officials that brownfield property owners can be reluctant to have their properties listed in a BRA financing plan out of fear of the stigma that the general public may attach to the site when it is recognized as a brownfield. The tendency is to list a site with a BRA only at the last minute when redevelopment work is about to commence and the financing framework must be in place.

Although DNRE does evaluate funding applications against local development plans, the effort is minimal, and the state is very reluctant to get too involved with local planning efforts. DNRE has no authority to require, for instance, that local plans be relevant or up to date. What is missing in this is any sort of requirement that a more general community redevelopment plan be in place to help ensure that projects are developed in such a way as to maximize beneficial community impacts. The six DNRE programs we examined do require that redevelopment potential be identified, and the semblance of a redevelopment plan is often in place as part of the funding application process, but these are parcel specific, and there only minimal requirements that such plans be consistent with overall community preferences as reflected in more general community development plans. To be sure, DNRE staff do check funding applications to make sure that the described redevelopment is in accordance with local development plans, but the local plans are the responsibility of the local units of government, and DNRE has no capacity or authority to insure that these local plans are current and reasonable.

With the aid of a $1,090,000 DNRE Site Reclamation Grant to site of the former Monroe, MI Steel Casting Plant is now the location of 102 new market rate townhouse condominium units known as the Townes on Front Street.

The potential for greater development coordination does exist with both the state and local BRAs working more closely together, and the state developing the capacity in such local entities to look beyond fiscal and other economic benefits. These sorts of state and local connections would likely improve the ability of DNRE to follow up on the redevelopment aspects of its programs,

and aid in the promotion of the types of public-private partnerships that have become hallmark in current efforts to redevelop brownfield sites (Hamlin et al. 2005; Hula 2002a; 2002b).

Developing local capacity to design and implement brownfield redevelopment plans that reflect local understandings and political culture is critical. For example, the private sector has been instrumental in championing brownfield redevelopment efforts in SW Michigan, while in SE Michigan civic leaders have tended to provided this boost. In Benton Harbor it is the Whirlpool Corporation and its philanthropic foundation that have set the tone for that city's immense Harbor Shores undertaking, while in Monroe, city officials have been outspoken in their efforts at dealing with that community's many brownfield issues. What the 55 case studies of this project have revealed is that there is no singular approach to creating public-private partnerships that works best at fostering successful brownfield redevelopment.

To be sure, both federal and state governments play legitimate and essential policy and fiscal oversight roles in local brownfield redevelopment efforts. They are also instrumental in the development of local capacity to address such efforts. Yet, both federal and state authorities must also take on the more decentralized roles of current government effort. If state environmental remediation dollars are to be maximized, the state must maintain a high degree of flexibility in allowing local communities to set desired brownfield redevelopment outcomes.

The Whirlpool Corporation has been a contributor to the success of the Edgewater area redevelopment effort in St. Joseph, MI. This site was once the home of a major foundry operation that required significant demolition and remediation effort before redevelopment as a successful commercial and research office complex.

There must be some effort at controlling local competition through regional coordination. This issue has been addressed above in the discussion of the Michigan brownfield redevelopment policy context. The state has allowed BRAs to function at the county level with local approval, which has been helpful at coordinating brownfield redevelopment efforts across municipalities. Further, adjoining jurisdictions around the state have voluntarily entered into intergovernmental agreements to coordinate environmental remediation and redevelopment efforts. However, as illustrated in policy studies by the Michigan Land Use Institute (2005) and Good Jobs First (LeRoy et al, 2006) more must be done to coordinate state policy, particularly in the area of economic development. As these studies clearly indicate, there is a tendency for the state to invest disproportionally in suburban areas, often at the expense of older, urban jurisdictions where the preponderance of brownfield sites are located. Although it is not realistic to expect the state legislature to reverse such disproportional investment (State legislators do recognize the national trend that much political clout that has shifted towards the suburbs.), there must be greater recognition that such expenditure patterns do exist, and that they tend to provide hidden subsidies that tend to favor greenfield development over brownfield redevelopment.

Such 'favoritism' seems to underlie a significant portion of state investment in the area of economic development, including brownfield redevelopment. It helps to fuel the competition for new development activity that has led to some of the lack of municipal cooperation and regional coordination described above. It has also contributed to a preference for greenfield development over brownfield redevelopment that is apparent in the state. However, some progress has been made in this area. A sense of regional cooperation found in a number of successful brownfield projects is noteworthy. So are some of the findings in the Michigan Land Use Leadership Council report (2003). Our sense is that administrative application of "smart growth" principles is significant, and can be used by DNRE to help direct redevelopment efforts and encourage more regional cooperation.

Finally, in a more specific vein, this research effort has suggested a half-dozen interrelated factors that underlie most successful brownfield redevelopment efforts in the state. Currently in the application process for DNRE funding, these factors are not directly accounted for in any consistent and coherent fashion. Although we recognized the limitations of the research process that has led to the discussion of these factors, the state should consider the possibility of their incorporation into the redevelopment proposal process. A word of caution in this regard, however. DNRE is mindful of the need to process funding applications in a timely fashion, and it does a very good job of this (Michigan Department of Environmental Quality 2006; 2008). Any changes to the application and approval process will need to keep the time issue in mind.

Relatedly, and perhaps more importantly, the state needs to work more closely with local communities to make sure that issues associated with these success factors are addressed at that local level, and that this is carried over to more regional and state-wide scales. The need for this cooperation has been noted above, and it should be added that the education of the public in respect to both smart growth principles and the value of brownfield redevelopment could go a long way towards helping to integrate these success factors into local brownfield efforts.

There is a model for all of this that is currently in place for local communities in Southeast Michigan. The Michigan Suburbs Alliance, a coalition of older Detroit area suburbs and other communities, has developed a certification program known as "Redevelopment Ready Communities" (Michigan Suburbs Alliance 2007). This program provides multiple recommendations that communities can utilize in preparing themselves for the redevelopment of vacant, abandoned, and underutilized properties. This certification program already incorporates some of the success factors discussed above, and more importantly, serves as a model for developing a similar process that can be applied at the state level.

How Successful, Michigan?

Within Michigan's environmental policy context, how successful has Michigan been at encouraging both remediation and redevelopment? From the standpoint of remediation, it can be argued that the state has been very successful. Looking at DNRE data for 365 projects representing just over $155 million in DNRE funding support, all but a very small handful of projects have been successful, at least insofar as remediation activities are concerned. These projects date between 1989 and 2008, which means that most have completed their remediation work. Bear in mind, however, that DNRE has no legislative mandate and only very limited capacity to follow up on the actual redevelopment of brownfield redevelopment projects. Further, what limited capacity does exist is often in association with other state agencies such as the Michigan State Housing Authority or the Michigan Economic Development Council that have their own particular interests and legislative mandates to pursue.

All indications for examination of the 55 brownfield redevelopment projects are that Michigan has been at least somewhat successful at the redevelopment portion of brownfield redevelopment, despite its economic woes over the past half decade years. Certainly a significant amount of redevelopment has occurred at approximately 500 of the 1800 sites for which the state has invested funds for response and remediation activities (MDEQ 2008). Further, we estimate that between half and two thirds of those redevelopment projects have been in conjunction with the six DNRE programs identified in this study. However, much work remains to assess more fully brownfield redevelopment projects in Michigan, and to develop more fully a methodology and database that will allow the state to track its investments in preparing brownfield sites for redevelopment, and that will assist DNRE in the evaluation of brownfield redevelopment project outcomes.

One area where Michigan's efforts do seem to be lacking relates to the environmental impacts of the redeveloped sites. Although our project evaluations do show that the projects have done all that is "typical" in minimizing environmental impacts, developers of these projects, whether public or private, have not taken the extra step to provide leadership in creating "green," sustainable projects. Some of the projects we evaluated do use energy efficient lighting, and residential projects do offer Energy Star rated appliance packages. None, however, are LEED certified. Further, very few use alternative storm water management systems such as bioswales and pervious surface treatments, rain gardens, and other low-impact strategies. Certainly, some of this is understandable. Both the Mason Run project in Monroe and the Edgewater project on

St. Joseph have contaminated soils encapsulated on site. Porous pavement surfaces would not be acceptable, defeating environmental remediation efforts developed for the project.

The "Village" at Grand Landing includes a "main street" with mixed residential units above retail shops. Once completed, this project near downtown Grand Haven, MI, will include a variety of residential units, hotel, and restaurant facilities in addition to retail shops. The project has used $2 million in DNRE grants and loans for assessment and remediation activities on what was once a mix of residential and industrial properties.

Perhaps no project is more telling in this regard than the Grand Landing project in Grand Haven. A multi-phased, mixed-use residential/commercial/retail project currently under development, the project was to have included innovative on-site storm water management techniques. The developer's application for DNRE support indicated the project would include permeable surfaces in the parking areas, bio-remediation, and on-site containment and cleaning of all stormwater runoff. However, local planning officials indicate that these techniques have not been used in the actual development so far. Rather, they have been eschewed in favor of expediency (planning commission evaluation of the innovative techniques was apparently taking more time that anticipated) and monetary savings due to the economic downturn. In all fairness, it should be noted that the project is a nice addition to the Grand Haven community, and does take advantage of its location near the center of the city, major transportation arteries, and, of course, its waterfront location along the Grand River and proximity to Michigan's coastal amenities.

Directions for Future Research

Issues related to long-term successfulness of brownfield redevelopment projects in Michigan came up in a number of interviews we conducted of facility users. Obviously, people were comfortable enough to live in the homes, work at the jobs, shop at the stores, and use the recreational facilities resulting from redevelopment. Yet, some concerns were expressed about the ability of the state's flexible clean-up standards to protect the public health over the long term. Several individuals were surprised to learn that the state did not necessarily require that sites be totally cleaned, and wondered aloud what long-term impacts there might be as a result of contaminated materials remaining on site.

Relatedly, questions of the near- and long-term adequacy of technological solutions such as encapsulating contaminated material under streets arose. "What happens if the city crews come

along in a year or two and need to dig up the street for some kind of repair? What's to keep kids from coming along and riding their bikes through that stuff when nobody's looking?"

Such questions also apply to the adequacy of institutional controls. Are restrictions applied through municipal zoning, subdivision, and other land use regulations adequate to protect the public in the very long term? Institutional memory of the what, where, and why of such controls may tend to be set aside when it comes to some future proposal for a new economic development project that meets a pressing community need. And this is to say nothing of the pressures that that private market can exert to change municipal regulation. Clearly, such long- term issues need to be addressed as part of the definition of successful brownfield redevelopment.

Major Factors that Delayed or Impeded Site Redevelopment	Number of Projects Impacted
Michigan economy	9
other general economic problems	7
weak or poor project leadership	6
insufficient public funding support	5
confusing, inflexible regulatory environment	4
developer exceeded capacity for project	3
lack of public support	3
ongoing public concern over contamination	3
complexity of project	2
no or poor vision for redevelopment	2
lack of regional cooperation	1
insufficient connection beyond local area	1

Table 4. Most frequently mentioned challenges identified in brownfield redevelopment efforts based on interviews, site observations, and media accounts. Numbers indicate the number of different redevelopment projects for which the listed issue was indicated. It should be noted that the emphasis in this research project was on redevelopment success, rather than impediments to that success. Thus, data presented in this table is not complete for all project sites, nor was it collected systematically. It is presented here more as a suggestion for future research than as a definitive statement related to brownfield redevelopment success.

A second concern for follow-up study relates to projects that are less than successful (Table 4). We examined only a small handful of such projects, primarily as a point of comparison related to the broad elements commonly held among successful redevelopment efforts. As mentioned, DNRE does not have sufficient capacity to follow up on projects once the remediation work is complete. Thus, there is no accurate count of exactly how many projects have been started, but with little or no actual redevelopment work done.

Once the site of numerous abandoned industrial facilities and a garbage dump (above), the Paw Paw River corridor (left) has been cleanup up with the aid of $2 million in DNRE grants and loans. It is now part of the Harbor Shores development effort that is helping to remake the economy of Benton Harbor.

Of the less than successful projects we examined, some have not even begun assessment and remediation work as described in their applications for state funding support. Others have done some assessment work (including baseline assessment, Phase I, or Phase II activity), but little remediation has been completed. Still others have at least begun remediation activity. In all instances, none of the intended redevelopment work has actually been started, and there is no sign of any on-going activity on the sites. Clearly the state's investment in such properties has had little return. A better understanding of the issues faced by these projects could provide valuable insight into essential elements of success, and help local jurisdictions and developers avoid some of the pitfalls leading to project delays and failure.

Finally, on the matter of economic impacts, much work remains to be done. It is relatively easy to assess, for instance the number of jobs a redevelopment project creates -- both temporary positions such as project construction, and permanent positions. But what of the impact that brownfield redevelopment has on surrounding property values. In this regard, access to current and historic property assessments can be difficult and time consuming. This issue, however, is becoming less of a concern as increasing numbers of jurisdictions digitize assessment data and make it available in various electronic formats, including over the web. There has also been promising work as to how such property value impacts can be assessed (Leigh and Coffin 2006). However, caution is in order here, for as the authors note at the outset: "Our results suggest that short-term economic efficiency is neither the most appropriate nor the only criterion on which to base public investment decisions for remediation" (Leigh and Coffin 2006, 257).

Additionally, this research was conducted before the bursting of the housing bubble, making it relatively easy to identify impacts of remediation and redevelopment on adjacent property values (with the caveat that identifying and isolating variables that impact property values is never that easy). Moreover, their efforts treat property values in the aggregate compared against general federal and state policy shifts, rather than looking at specific properties against actual remediation and redevelopment efforts. Nevertheless, this research area does hold some promise in better understanding the full impacts of brownfield redevelopment.

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Appendix A

DNRE Brownfield Redevelopment Success Project Assessment

Date(s) of project assessment
    archival:
    site visit:

Project Identification Information

Project name:
Project ID:
Tracking ID:
MERA ID:
Project location
    County:
    City:
    Site Address (be as specific as possible; may have multiple addresses):
    Other location information (e.g. lat-long)
Current use of site:
Does this use meet current zoning for the site:
Historic use of site (give dates, if known):
Property owner(s):
Overall size of site (acres or sf):
Area for remediation (acres or sf):
Parcel tax IDs:

DNRE Program -- funded amount and award date:
    Site Assessment Grant:
    Site Reclamation Grant:
    CMI Brownfield Grant:
    CMI Brownfield Loan:
    Waterfront Redevelopment Grant:
    Revitalization Revolving Loan Fund:
    Other DNRE, EPA, local, or other funds used for site remediation
        Source:
        Amount:
        Award date:
Name of applicant for DNRE funding:
    contact information:
Name of DNRE project manager responsible for grant/loan project administration:
Remediation activity dates
    start:
    end:
Is the project included in a BRA plan or other local development plan?
Provide a brief project summary (2-3 sentences)

Provide a brief description of the site:
prior to remediation activities (attach photos, if available):
current conditions (attach photos, if available):
Is remediation and redevelopment activity complete? If not, briefly describe what has been done, and what remains to be done.
Can some "champion (s)" be identified for the project?
(This could be an individual, a group of people, a private entity, a non-profit organization, a government agency, etc. The champion sees the project through to completion, helping overcome obstacles and impediments along the way. Without a champion, the project may not have been successful.)
provide name and contact information

Environmental Information

Remediation Activity
Have the following reports been completed for the project? If so, give date and file location.
Baseline Environmental Assessment (BEA):
Phase I Environmental Site Assessment (Phase I ESA):
Phase II Environmental Site Assessment (Phase II ESA):
Any other environmental assessment reports:
Was the site deemed a "facility" prior to redevelopment?
Is any part of the site still considered a "facility"?
Briefly describe the type and extent of environmental contamination on the redevelopment site.
Briefly describe the remediation activity that was undertaken
Did remediation meet the required state standard for redevelopment?
Which standard?
residential
commercial
industrial
"lim ited" residential
"lim ited" commercial
"lim ited" industrial
recreational
Did remediation exceed the required standard for the type of project?
why?
who paid for the additional remediation?
Are remediation activities on going?
Describe
Are there significant remaining concerns?
Describe
Are there continuing use restrictions?
What are they?
Are there other measureable environmental benefits not described above?
What are they?

In your opinion, what are the top three environmental benefits realized from remediation?
1)
2)
3)

Redevelopment Activity

Stormwater management

How is stormwater runoff handled on the site

Are there non-point source pollution controls in place?

Does the site include environmentally sensitive areas? (wetlands, stream corridors, wildlife corridors, groundwater recharge areas, steep slopes, flood plains, etc.)

what are they?

Are their environmentally sensitive areas adjacent to the redevelopment site?

what are they?

Does the redevelopment project include provisions to protect any on-site or adjacent sensitive areas?

Is the redevelopment land use appropriately compatible with surrounding land uses?

Is the redevelopment land use appropriately screened or buffered from adjacent incompatible land uses?

Does the redevelopment project meet or exceed any current defined national or state environmental standards program (e.g. LEED, LEED-NR)?

what standard?

Does the redevelopment project provide other environmental benefits not described above?

describe these

In your opinion, what are the top three environmental benefits realized from redevelopment?
1)
2)
3)

Social Impact Information

Does the project seem appropriate with the surrounding neighborhood context?

Has there been public participation in the remediation and redevelopment effort?

briefly describe the extent of this participation?

Does the redevelopment project provide space for public amenities?

developed park space or recreation facilities

relatively undeveloped open space/natural areas

waterfront access

other public amenity

(briefly describe)

Does the redevelopment project provide space for government activities?
briefly describe
Are any types of social service activities provided for in the redevelopment?
briefly describe
Has the redevelopment effort lead to revitalization of adjacent properties or neighborhoods?
Does the project assist low-income groups in the community or provide needed social services?
Does the project help meet the goals and objectives of a community master plan?
Does the project help meet the goals and objectives of a brownfield redevelopment plan?
Is there evidence that the community has modified its development review and approval process to facilitate brownfield redevelopment?
Has the community been certified as redevelopment ready?
Housing
what type of units are created
number of units created:
owner occupied rental other tenure (e.g. co-op)
is there a need for such housing as defined in local master plan or other housing plan
affordability -- number of units affordable to those earning 80% or less of MHI
is affordability considered an issue in the community as defined in local master plan or other housing plan
is the housing in reasonable proximity to supporting infrastructure and amenities (describe)
Commercial
what type of commercial units are created
is there a need for such commercial development as defined in local master plan or other plan
does the commercial development serve to strengthen existing commercial activity
does the commercial development contribute to sprawl and low-density development
Industrial
what type of industrial activities are served
is there a need for such development as defined in local master plan or other plan
does the redevelopment serve to strengthen existing industrial activity
are the industrial jobs created in reasonable proximity to appropriate housing
what transportation facilities and other supporting infrastructure is nearby
Does the redevelopment project meet other state goals?
econom ic development
Land Use Leadership Council
sm art growth
In your opinion, what are the top three social/community benefits realized from redevelopment?
1)
2)
3)

Economic Impact Information

Is existing infrastructure re-used?
Is the project located in a state designated Core Community?
Is the project located in an Empowerment Zone?
Is the project in an Enterprise Community?
A Renewal Community?
Is the project in a City of Promise
Is the project near a designated Cool Cities neighborhood?
estimate potential tax base increase (in application files)
for subject property
for adjacent property
neighborhood economic effects
economic leveraging
what other public funds are used (grants, loans)
provide name, date, and amounts
what is the amount of private investment in the project
Does the project use tax incentives of any sort?
describe
Is the project in a TIF district?
list TIF authority
employment
how many temporary jobs are created through"
rem ediation and site prep activities
construction
projec t marketing/real estate
are long-term new jobs created with redevelopment?
how many?
are these living wage jobs (based on area median income)?
Does the project meet local economic development needs as defined in local master plans?
Does the project meet other state economic development goals?
In your opinion, what are the top three economic benefits realized from redevelopment?
1)
2)
3)

NOTE to project evaluators: this brownfield redevelopment project evaluation instrument is intended as a way to focus the research effort by providing specific categories for assessment and evaluation. It is also a tool for organizing field notes to make sure that essential information is not forgotten. As such, it may not be possible to provide all the listed information. This should not be viewed as a problem, but as part of the iterative process being used to develop and refine the assessment instrument. The project evaluator also should feel free to add any additional project information that might be considered important at the time of the assessment.

Appendix B

Michigan Brownfield Redevelopment

DNRE Project Case Studies

Project Name	Project Location		DNRE Program	DNRE Award Amount	Year Awarded	DNRE Funded Activities	Prior Property Usage	Redevelopment Project Type	Curent Status
	County	Municipality							
Diamond REO	Ingham	Lansing	Site Reclamation Grant	$2,000,000	1992	Due Care Implementation, Other Environmental Response Action	industrial	commercial and light industrial	substantially complete
Star Watch Case	Mason	Ludington	Site Reclamation Grant	$855,700	1993	Due Care Implementation, Other Environmental Response Action	industrial	residential and recreational	substantially complete
Mulberry Place	Wayne	Wyandotte	Site Reclamation Grant	$182,000	1993	Due Care Implementation, Demolition, Interim Response Action	industrial and mixed	residential	substantially complete
Lakeshore Blvd Ext.	Marquette	Marquette	Site Assessment Grant	$148,630	1994	Due Care Planning	industrial	recreational	substantially complete
SSM Industrial Park	Chippewa	Sault St Marie	Site Assessment Grant	$180,000	1994	Due Care Planning	industrial	industrial	substantially complete
300 Marquette/WCRR	Mackinac	Saint Ignace	Site Assessment Grant	$62,753	1994	Due Care Planning	industrial	recreational and commercial	current
			Site Reclamation Grant	$27,183	1994				
Manistique Industrial Park	Schoolcraft	Manistique	Site Assessment Grant	$630,000	1994	Due Care Planning	industrial	industrial	current
Baseball Stadium	Ingham	Lansing	Site Reclamation Grant	$922,813	1995	Due Care Implementation, Other Environmental Response Action	industrial and commercial	recreational and commercial	substantially complete
Cheboygan Industrial Park	Cheboygan	Cheboygan	Site Assessment Grant	$23,500	1996	Due Care Planning	industrial	not redeveloped	no activity
Old Car Ferry Dock	Schoolcraft	Manistique	Site Assessment Grant	$70,000	1996	Due Care Planning	industrial	commercial, residential, and recreational	substantially complete
MagneTek	Shiawassee	Owosso	Site Reclamation Grant	$1,558,000	1996	Due Care Implementation, Other Environmental Response Action	industrial	industrial	substantially complete
Monroe Steel Casting Plant	Monroe	Monroe	Site Reclamation Grant	$1,090,000	1996	Due Care Implementation, Other Environmental Response Action	industrial	residential	substantially complete
Traverse City Ironworks/River's Edge	Grand Traverse	Traverse City	Site Reclamation Grant	$1,582,975	1997	Site Assessment, Due Care Implementation, Other Environmental Response Action	industrial	residential	substantially complete
H. Brown Company Superfund Site	Kent	Walker	Site Reclamation Grant	$289,300	1998	Due Care Implementation, Other Environmental Response Action	industrial	light industrial	substantially complete
Alpena Riverfront Area	Alpena	Alpena	Site Assessment Grant	$48,000	1998	Due Care Planning	mixed	mixed and recreational	substantially complete
St. Anne's Gate	Wayne	Detroit	Site Reclamation Grant	$808,000	1998	Due Care Implementation, Other Environmental Response Action	mixed residential commercial	residential	substantially complete
Former Marx Manufacturing Facility	Wayne	Taylor	Site Reclamation Grant	$200,000	1998	Due Care Implementation, Other Environmental Response Action	industrial	commercial	substantially complete
Harbour View Center	Grand Traverse	Traverse City	Revitalization Revolving Loan Fund	$269,535	1998	Due Care Implementation, Demolition, Interim Response Action	industrial	mixed residential and commercial	substantially complete
Atlantic Automotive (North of Main Industrial Area)	Berrien	Benton Harbor	Site Reclamation Grant	$2,000,000	1998	Due Care Implementation, Other Environmental Response Action	industrial	industrial	current
American Brownhoist (also see Bay City Waterfront)	Bay	Bay City	Site Reclamation Grant	$1,416,000	1998	preliminay investigation; funds returned to MDEQ	industrial	not redeveloped	cancelled (grant funds returned)
Park Street Redevelopment	Grand Traverse	Traverse City	Site Reclamation Grant	$661,800	1999	site investigation; remove USTs and contaminated soil	industrial	mixed residential, commercial, and recreational	substantially complete
Grosse Ile Airport & Commerce Park	Wayne	Grosse Ile Twp	Waterfront Redevelopment Grant	$749,000	2000	infrastructure; due care implementation: other environmental response action	military base	commercial and airport	substantially complete
			Site Reclamation Grant	$220,000	1999				
			Revitalization Revolving Loan Fund	$850,000	1999				
American Foundry Property	Washtenaw	Milan	Site Reclamation Grant	$384,410	1999	site investigation, soil excavationand removal; concrete crushing	industrial	residential	substantially complete
Bay City Waterfront	Bay	Bay City	Waterfront Redevelopment Grant	$3,063,000	1999	Property Acquisition, Infrastructure, Business Relocation	industrial	not redeveloped	no activity
Race Street Waterfront Redevelopment	Ingham	Lansing	Waterfront Redevelopment Grant	$667,500	1999	public infrastructure and facility improvements	industrial	recreational	substantially complete
South Rail Yard	Marquette	Marquette	Waterfront Redevelopment Grant	$1,100,000	1999	Property Acquisition	industrial	mixed residential, commercial, and recreational	current

Mason Run	Monroe	Monroe City	Revitalization Revolving Loan Fund	$1,000,000	1999	Due Care Implementation, Other Environmental Response Action	industrial	residential and recreational	current
			Site Reclamation Grant	$1,000,000	1999				
			Brownfield Redevelopment Loan	$800,000	2004				
Edgewater	Berrien	St. Joseph	Waterfront Redevelopment Grant	$776,675	1999	infrastructure; due care implementation; other environmental response action	industrial	commercial and industrial	substantially complete
			Brownfield Redevelopment Grant	$651,000	2001				
Ludington Waterfront	Mason	Ludington	Waterfront Redevelopment Grant	$180,450	2000	Infrastructure, Demolition	mixed industrial and commercial	mixed commercial, residential, and recreational	substantially complete
Muskegon Waterfront	Muskegon	Muskegon	Waterfront Redevelopment Grant	$2,311,418	2000	Infrastructure, Demolition, Other Environmental Reponse Action	mixed industrial and commercial	mixed recreational and commercial	substantially complete
Karl Schmidt Unisia Property	Van Buren	South Haven	Brownfield Redevelopment Grant	$843,500	2000	Due Care Implementation, Other Environmental Response Action, Demolition	industrial	not redeveloped	no activity
Former Grand Rapids Die Cast	Kent	Walker	Revitalization Revolving Loan Fund	$295,000	2006	Due Care Implementation, Demolition, Interim Response Action	industrial	industrial	substantially complete
Grand Haven Waterfront	Ottawa	Grand Haven	Waterfront Redevelopment Grant	$880,000	2000	Property Acquisition	mixed industrial and commercial	mixed recreational and commercial	substantially complete
Water Street	Washtenaw	Ypsilanti	Waterfront Redevelopment Grant	$3,728,000	2000	Property Acquisition, Assessment, Due Care Implementation	mixed industrial, commercial, and residential	not redeveloped	no activity
			Brownfield Redevelopment Loan	$500,000	2004				
			Waterfront Redevelopment Grant	$500,000	2004				
River Rouge Oxbow Restoration	Wayne	Dearborn	Waterfront Redevelopment Grant	$2,000,000	2000	Infrastructure, Restoration, Other Environmental Response Action	waterway	recreational waterway	substantially complete
Former Grand Rapids Die Cast	Kent	Walker	Revitalization Revolving Loan Fund	$295,000	2000	Due Care Implementation, Other Environmental Response Action	industrial	industrial	substantially complete
			Site Reclamation Grant	$405,000	2000				
Leo Joe Smith Trust Site-Walmart	Wayne	Taylor	Site Reclamation Grant	$342,000	2000	Due Care Implementation, Other Environmental Response Action	commercial	commercial	substantially complete
Bay City Conference Center	Bay	Bay City	Brownfield Redevelopment Grant	$1,000,000	2001	Due Care Implementation, Other Environmental Response Action	mixed commercial industrial	commercial and recreational	substantially complete
			Site Reclamation Grant	$477,750	2001				
Alpena Third & River (Riverview Condos)	Alpena	Alpena	Site Reclamation Grant	$61,000	2001	Due Care Implementation	industrial and commercial	not redeveloped	no activity
Former Fletcher Paper	Alpena	Alpena	Site Assessment Grant	$264,500	2001	Due Care Planning	industrial	commercial and recreational	current
Muskegon Lakeshore Smart Zone	Muskegon	Muskegon	Brownfield Redevelopment Grant	$1,000,000	2002	Due Care Implementation	mixed	mixed	substantially complete
Grand Traverse Commons - Phase I & II	Grand Traverse	Traverse City	Brownfield Redevelopment Grant	$1,000,000	2003	Demolition, Due Care Implementation	state hospital	residential, commercial, and recreational	substantially complete
			Brownfield Redevelopment Grant	$1,000,000	2005				
Borden Building	Isabella	Mt. Pleasant	Brownfield Redevelopment Grant	$184,690	2006	Demolition, Property Aquisition, Infrastructure	industrial	municipal offices	substantially complete
			Waterfront Redevelopment Grant	$409,400	2004				
Waterfall Park	Bay	Bay City	Waterfront Redevelopment Grant	$150,000	2004	site acquisition and cleanup	public right of way	recreational	substantially complete
River Rasin Battlefield	Monroe	Monroe	Brownfield Redevelopment Grant	$1,000,000	2004	Demolition, Due Care Implementation	industrial	recreational	current
Baker Oil	Calhoun	Springfield	Brownfield Redevelopment Grant	$700,000	2005	Other Environmental Response Action, Due Care Implementation, Demolition	industrial	commercial	substantially complete
			Brownfield Redevelopment Loan	$300,000	2005				
Will Branscumb Property	Berrien	Benton Harbor	Brownfield Redevelopment Grant	$130,000	2005	Due Care Implementation, Demolition	industrial	not redeveloped	no activity
Hastings Library	Barry	Hastings	Brownfield Redevelopment Grant	$213,000	2005	Due Care Implementation		public library	substantially complete
Grand Landing	Ottawa	Grand Haven	Brownfield Redevelopment Grant	$1,000,000	2006	Due Care Implementation	industrial and commercial	mixed residential and commercial	current
			Brownfield Redevelopment Loan	$1,000,000	2006				
Elberta Waterfront Park	Benzie	Elberta	Site Reclamation Grant	$446,400	2003	Due Care Implementation, Other Environmental Response Action	industrial	recreational	substantially complete
			Brownfield Redevelopment Grant	$735,387	2006				
			Brownfield Redevelopment Loan	$250,000	2006				
R&B Electronics	Chippewa	Sault Saint Marie	Brownfield Redevelopment Grant	$155,000	2006	Phase I/Phase II Investigation, Other Environmental Response Action	industrial	industrial	substantially complete
Habitat for Humanity	Ingham	Lansing	Brownfield Redevelopment Grant	$249,750	2006	Phase I/Phase II Investigation, Due Care Implementation	industrial	residential	substantially complete

Traverse City Place	Grand Traverse	Traverse City	Brownfield Redevelopment Grant	$1,000,000	2006	Due Care Implementation, Other Environmental Response Action	industrial and commercial	not redeveloped	no activity
			Brownfield Redevelopment Loan	$1,000,000	2006				
Harbor Shores	Berrien	Benton Harbor St. Joseph	Brownfield Redevelopment Grant	$1,000,000	2007	Demolition, Due Care Implementation	industrial and commercial	residential, commercial, and recreational	current
			Brownfield Redevelopment Loan	$1,000,000	2007				
Tawas City Downtown	Iosco	Tawas City	Waterfront Redevelopment Grant	$60,000	2008	property acquisition, infrastructure, due care implementation	commercial	recreational	substantially complete
Total of DEQ Awards				$54,355,019					

A project status of "substantially complete" means that most, if not all, of the redevelopment effort has been completed and the project has been successfully occupied.

A project status of "current" indicates that redevelopment activity is currently underway on the site and there is evidence to suggest that the project will be substantially completed as planned.

A project status of "no activity" indicates that no redevelopment has taken place and that it is not likely to begin in the near future. Some remediation and site clearing activity may have taken place in the past, but no work is currently on-going.

(former Fletcher Paper Mill, Alpena)

Project Partners:

Michigan Department of Natural Resources and Environment (formerly Department of Environmental Quality),
Remediation and Redevelopment Division,
Brownfield Grants and Loans Program:
Susan Erickson, Manager
Trevor Ryan, intern
Jeff Hukill
Jennifer Geisenhaver, intern
Carrie Geyer
Bruce Moore,

Eastern Michigan University
Department of Geography and Geology:
William Welsh
Zachary Jones, graduate assistant
Robert Jones
Lauren Carlson, graduate assistant
Gene Jaworski
Kristen Delaney, graduate assistant
Nina David
Jim Hickey, GIS assistant
Institute for Geospatial Research and Education:
Yichun Xie, Director
Mike Dueweke, Project Manager