Brownfield Redevelopment

A Quantitative and Qualitative Analysis

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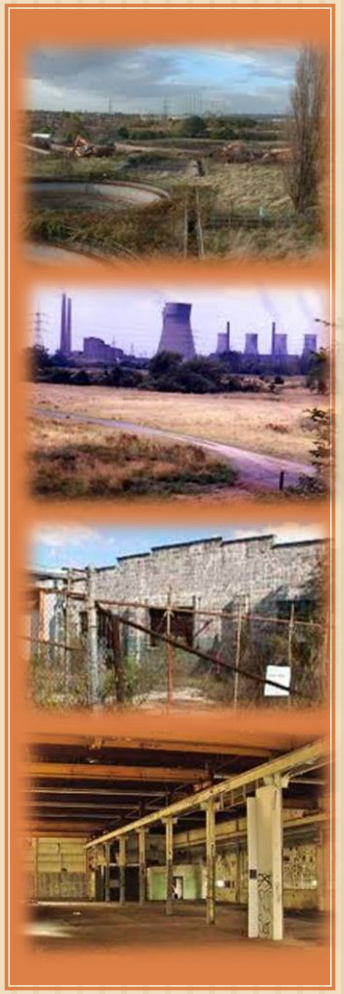
Brownfield (as defined by the EPA)



"A 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."

A Brief Timeline

1992
The term Brownfield is first used

1993
Cuyahoga County is selected as the first Brownfield pilot.

1994
Brownfields Tax Incentive approved

1997
Brownfields National Partnership announced.

2002
Brownfield Revitalization and Environmental Restoration Act approved.

2009
HUD issued a revised contamination policy for multi-family housing projects and Brownfield redevelopment is mentioned in an EPA report on fighting climate change.

History of Brownfield Remediation

- The term *Brownfields* was coined on June 28, 1992, at a U.S. congressional field hearing hosted by the Northeast Midwest Congressional Coalition, and the first detailed policy analysis of the issue was convened by the Cuyahoga County Planning Commission. The next year, the EPA selected Cuyahoga County as its first Brownfield pilot project.

- Under the Brownfields Tax Incentive, environmental cleanup costs are fully deductible in the year incurred, rather than capitalized and spread over time. Improvements in 2006 expanded the tax incentive to include petroleum cleanup

- Brownfield Revitalization and Environmental Restoration Act approved provides grants for inventorying, characterizing, assessing, remediating, and conducting planning related to Brownfield sites. Defines a "Brownfield site," and also exempts from liability under CERCLA some property owners that may have had land contaminated by nearby property possessed by other owners.

Why Reuse?

PROS

- Contributes to smart growth practices by reclaiming underused space and establishing new growth in areas with existing infrastructure.
- Particularly in mill renovations, re-use can improve water quality and make riverfronts accessible to pedestrians.
- Preserves historic, cultural, or social icons important to community identity.
- Can support a variety of businesses, interests, and needs of the community. Often are great for mixed use developments, which provide high density housing helping to prevent sprawl, conserves natural resources, agricultural land, and forests by concentrating development.
- Improves environmental health through remediation of degraded and contaminated buildings and land.

MORE PROS…

- Reduces auto dependency by concentrating development to cultivate healthier communities while mitigating greenhouse gas emissions.
- Reuse converts areas that are a drain on taxes and municipal services into financial assets through improved property values, higher property taxes, and often new sources of revenue.
- Produces employment opportunities for local workers (which can cut commuting behavior).
- Surrounding property owners tend to reinvest, making their properties more valuable and typically resulting in a higher tax yield for the community.
- The environmental remediation of Brownfields leads to environmental improvements to adjacent waterways.

Other [Financial] Benefits

Preserves Greenfields

Health benefits

Compact development

Stakeholders in Remediation Projects

Society

Society is a representation of the benefits as they relate to the country as a whole. Society is interested in job creation, tax growth, environmental and health benefits. The goal of society is to see private remediation efforts create profit for all, or to use federal financial resources to maximize social benefits.

City

The city where the Brownfield is located benefits from redevelopment by transforming vacant land into revenue and job producing property. The actual redevelopment also creates short-term jobs and commercial reuse creates jobs in the long term.

Developers

In most cases, the developers interest is making money, so Brownfield remediation does not always appeal to them as there are greater costs associated with redevelopment.

Local Residents

Locals benefit directly in the regards of reduced health risks, and increased aesthetic neighborhood values. With higher valued properties and les vacant lots, crime rates often also fall. There are also potential negative impacts in that new commercial developments may increase traffic, noise, or tax rates.

Cost Analysis

Direct Costs

- Site assessment
  - Assessment costs can range from $20,000 to upwards of $500,000 depending on many factors like lot size and pollution level.
- Environmental remediation
- Environmental remediation insurance
  - Developers can invest in cost-cap or pollution legal liability.

Indirect Costs

- Financing premiums
  - Lenders are less likely to invest so acquiring financing is often difficult.
- Legal fees
  - There are generally more legal consideration with Brownfields so developers may need to pay higher filing fees at the very least.
- Extended development period
  - For all the testing and financing remediations typically take more time and developers lose money on other projects that they can't give their time to.

The use of industrial land as a resource for the creation of new employment is a major economic and policy issue throughout the country. In the Portland, Oregon metropolitan area, a number of efforts are underway to appreciate and address the issue of Brownfield redevelopment.

As part of their discussion on industrial land, the Port of Portland, Portland Development Commission, METRO and the Portland Bureau of Planning sponsored a Brownfield/Greenfield Development Cost Comparison Study with the goal of providing a better understanding of costs and issues associated with industrial development of Greenfield sites and the redevelopment of Brownfield sites. The study also compares Brownfield and Greenfield development costs. Using case-studies, the project compared costs associated with specific industrial projects between Brownfield sites and Greenfield sites. Four types of industrial development projects were identified: general manufacturing, high tech, warehouse and distribution, and industrial park.

CASE STUDIES

Sites Considered

The team used the land-residual approach (which subtracts the value of buildings from estimated market value, designating the remainder as the value of land) to estimate value differentials in the Brownfield vs. Greenfield properties.

High Tech Manufacturing

With the planned development, the site had an estimated negative residual land value of ($7.80) per square foot. The comparable Greenfield site had a positive residual land value of $6.42 psf.

Industrial Park

The Brownfield site had a positive residual land value of $0.80 per square foot and the Greenfield site had a positive residual land value of $1.33 per square foot.

Warehouse / Distribution

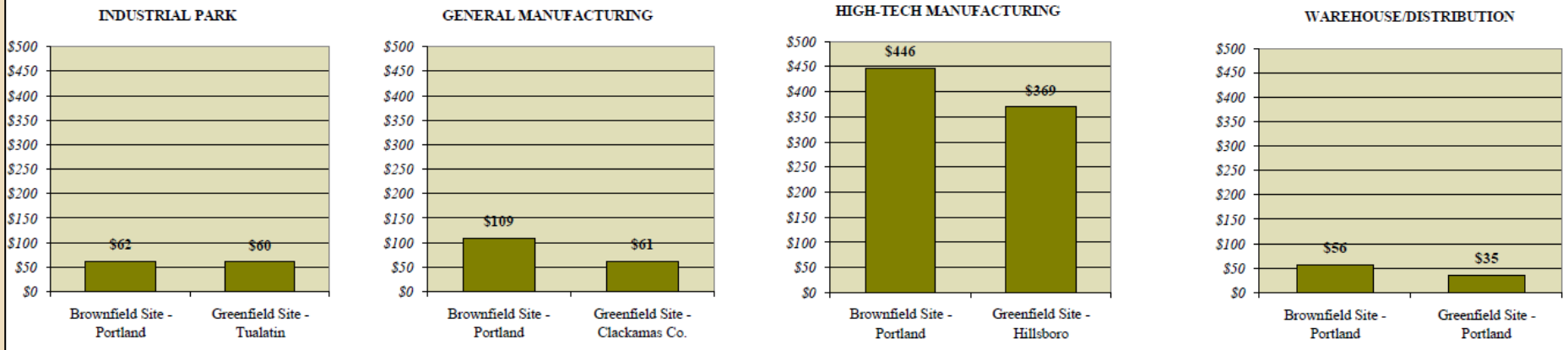
The Brownfield site had a negative residual land value of ($0.85) per square foot and the Greenfield site has a positive residual land value of $6.88 per square foot.

General Manufacturing

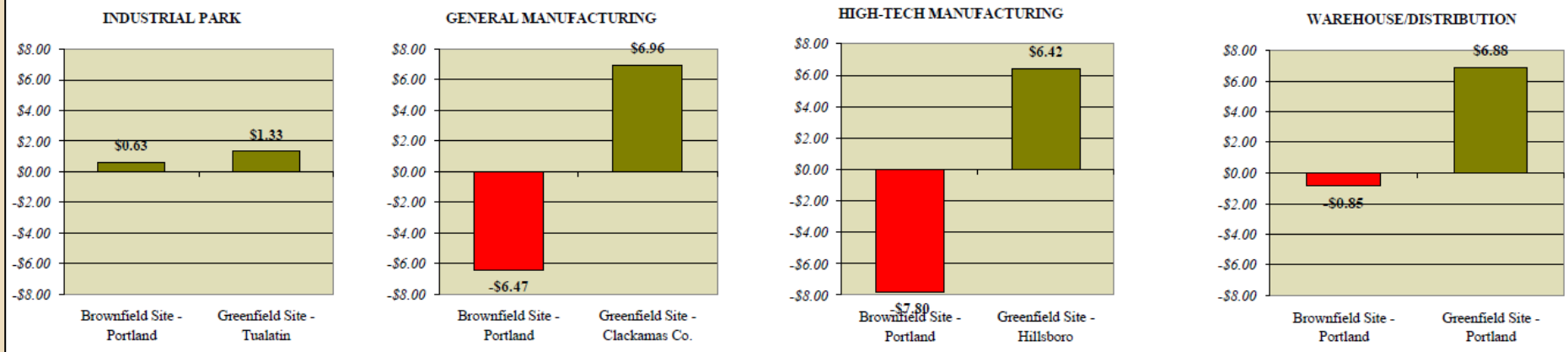
The Brownfield site had a negative residual land value of ($6.47) per square foot. The Greenfield site has a positive residual land value of $6.96 per square foot.

Site/ Concept	Net Site Size/Acres	Building S.F.	Environmental Remediation 1/	Construction Cost Hard	Construction Cost Soft	SDCs Calculated	SDCs Credits	SDCs Net	Infrastructure Costs	Total Cost/Less Land Total	Total Cost/Less Land PSF
Industrial Park											
Brownfield Site - Portland	45.50	630,000	$8,748,887	$23,086,500	$4,617,300	$1,846,243	($25,368)	$1,820,875	$558,000	$38,831,562	$61.64
Greenfield Site - Tualatin	44.50	630,000	$0	$25,050,000	$5,010,000	$1,713,209	$0	$1,713,209	$5,739,167	$37,512,376	$59.54
General Manufacturing											
Brownfield Site - Portland	35.75	450,000	$22,980,475	$20,857,500	$4,171,500	$1,212,343	($249,062)	$963,281	$24,000	$48,996,756	$108.88
Greenfield Site - Clackamas Co.	37.95	450,000	$0	$21,000,000	$4,200,000	$868,675	$0	$868,675	$1,347,000	$27,415,675	$60.92
High-Tech Manufacturing											
Brownfield Site - Portland	35.75	350,000	$28,027,465	$105,900,000	$21,180,000	$1,383,121	($249,062)	$1,134,059	$24,000	$156,265,524	$446.47
Greenfield Site - Hillsboro	53.20	350,000	$0	$105,000,000	$21,000,000	$1,782,663	$0	$1,782,663	$1,452,500	$129,235,163	$369.24
Warehouse/Distribution											
Brownfield Site - Portland	37.90	400,000	$7,821,799	$11,154,000	$2,230,800	$715,907	($75,858)	$640,049	$735,000	$22,581,648	$56.45
Greenfield Site - Portland	23.85	400,000	$0	$10,840,000	$2,168,000	$730,069	$0	$730,069	$290,500	$14,028,569	$35.07

TOTAL DEVELOPMENT COST/LESS LAND



CALCULATED RESIDUAL LAND VALUES



Estimated remediation costs of the Brownfield sites and the cost differential to produce comparable product to the Greenfield option.

	Brownfield Remediation Costs		Greenfield Infrastructure Costs		Overall Cost Differential	
Use	Total	PSF-Bldg.	Total	PSF-Bldg.	Total	PSF-Bldg.
Industrial Park	$8,471.756	$13.45	($5,181,167)	($8.22)	$982,055	$1.56
General Manufacturing	$22,980,475	$51.07	($1,323,000)	($2.94)	$21,581,081	$47,96
High-Tech Manufacturing	$28,027,465	$80.08	($1,428,500)	($4.08)	$27,030,361	$77.23
Warehouse/Distribution	$7,821,799	$19.55	$444,500	$1.11	$8,553,079	$21.38

As shown, the cost of remediation in these case studies negates the savings in infrastructure costs.

****This analysis approaches the development scenarios from the viewpoint of a private sector developer doing a speculative development. This assumption limits the direct applicability of the findings to this type of development. Alternative development approaches under a different scenario could include remediation by an end user, or remediation by a public sector entity. Under both approaches, remediation costs would be considerably less, particularly under a public sector remediation scenario.**

Public Benefits

	Brownfield Public Benefits	Greenfield Public Benefits	Public Benefit Differential
Use	Annual	Annual	Annual
Industrial Park	$1,400,000	$977,000	$423,000
General Manufacturing	$1,300,000	$465,000	$835,000
High-Tech Manufacturing	$3,430,000	$2,100,000	$1,330,000
Warehouse/Distribution	$482,000	$308,000	$174,000

In addition, there are many benefits that are not quantifiable. Brownfield redevelopment poses the following public benefits not accrued by Greenfield development:

- **Local income tax revenues**
- **Public land conservation and environmental policy goals**
- **Social benefits of contaminated site remediation and economic revitalization**
- **Enhancement of surrounding property values.**

ONE LAST CASE STUDY

The Whitin Mills

The mills were founded by Paul Whitin and his sons in 1831 on the banks of the Mumford River in South Northbridge, which was later re-named Whitinsville in his honor

The Whitin Machine Works became one of the largest textile machinery companies in the world.

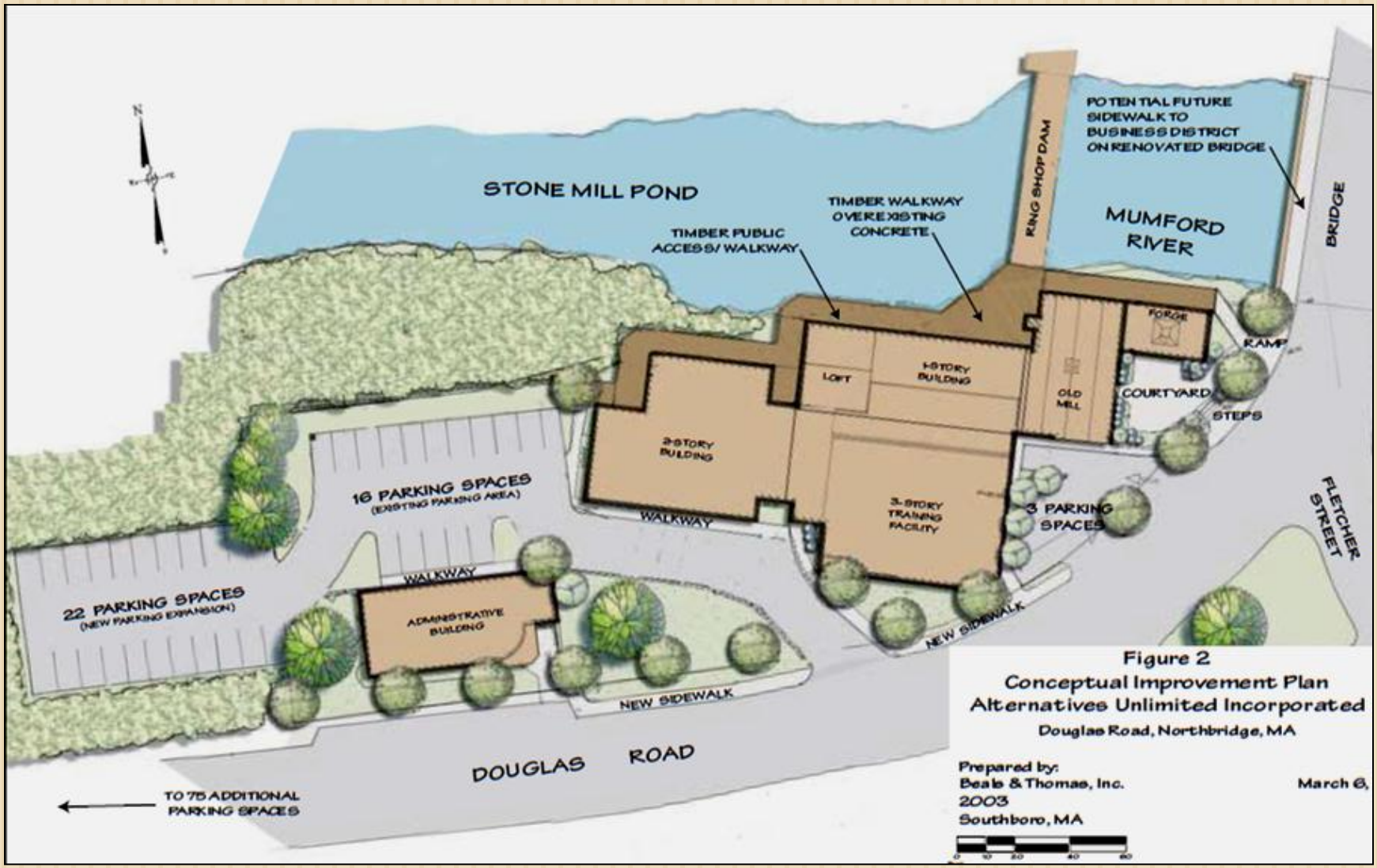
At it's peak, the mill employed 5,615 men and women.

The Shop was the center of life in Whitinsville for over 135 years until it closed in 1976.

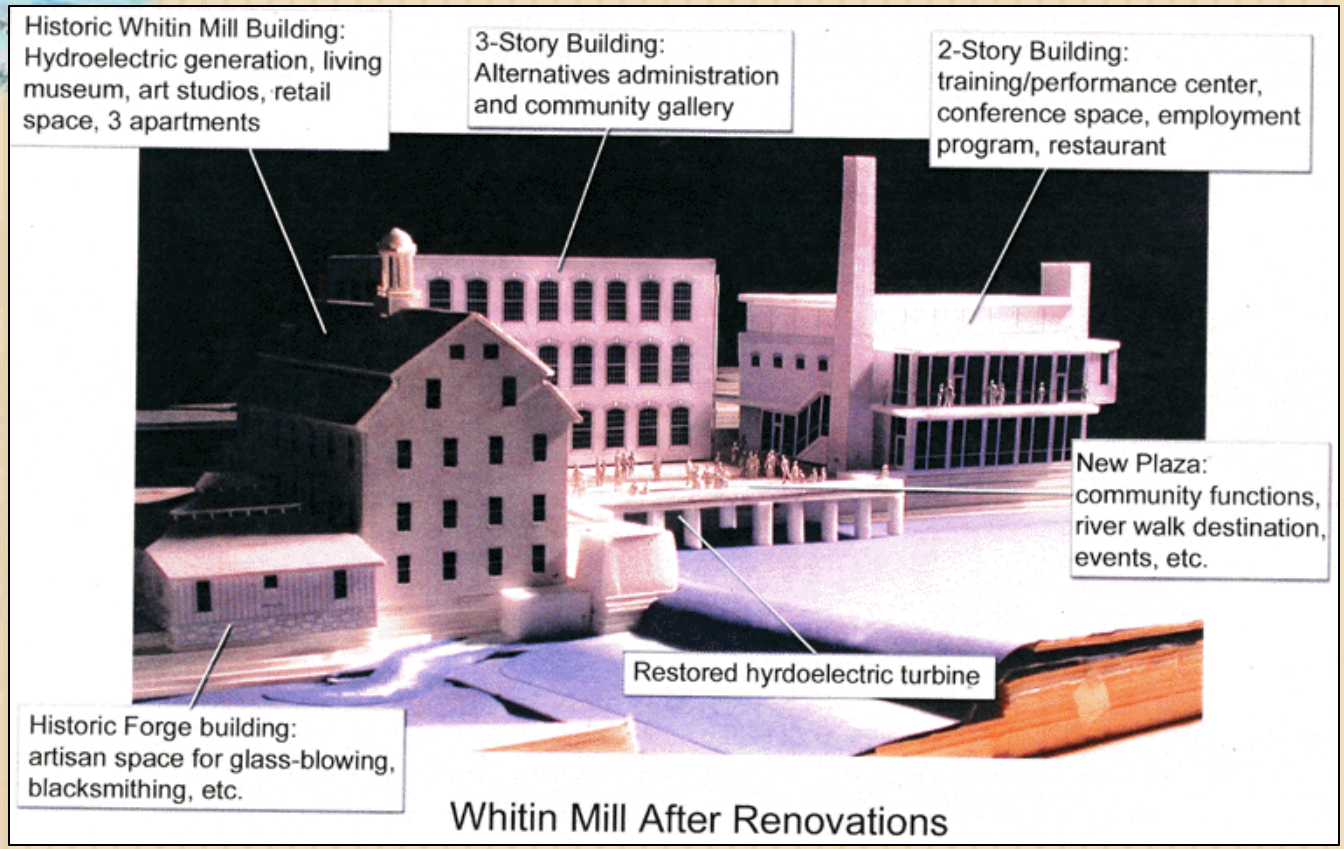
As the textile businesses expanded, so did the town. More housing was provided by the company for new workers on North Main St. and on other side streets.

Many of these houses and the original mill buildings are still standing and are a huge part of the Northbridge-Whitinsville culture.

The Plan…


STONE MILL POND
TIMBER PUBLIC ACCESS/ WALKWAY
TIMBER WALKWAY OVER EXISTING CONCRETE
KING SHOP DAM
POTENTIAL FUTURE SIDEWALK TO BUSINESS DISTRICT ON RENOVATED BRIDGE
MUMFORD RIVER
BRIDGE
FORGE
RAMP
LOFT
4-STORY BUILDING
OLD MILL
COURTYARD
STEPS
2-STORY BUILDING
16 PARKING SPACES
(EXISTING PARKING AREA)
WALKWAY
3-STORY TRAINING FACILITY
3 PARKING SPACES
FLETCHER STREET
22 PARKING SPACES
(NEW PARKING EXPANSION)
WALKWAY
ADMINISTRATIVE BUILDING
NEW SIDEWALK
NEW SIDEWALK
DOUGLAS ROAD
TO 75 ADDITIONAL PARKING SPACES
Figure 2
Conceptual Improvement Plan
Alternatives Unlimited Incorporated
Douglas Road, Northbridge, MA
Prepared by:
Beals & Thomas, Inc.
2003
Southboro, MA
March 6,

Selling the Vision



Whitin Mill After Renovations

The Mills Today

Mill renovations in particular provide flexible space for small firms or businesses. Thus, these businesses have the opportunity to grow and prosper while remaining in the mill.

- The Shop is fully occupied again! It now holds 26 different businesses and provides employment for around 2,000 area residents.
- The main mill building now houses a community theater, an array of meeting spaces, art galleries and studios, an outdoor patio area, and four affordable apartment units.
- The Old Forge was restored to its original condition and is available for local artisans, like a Blacksmith or Glass Blower.
- The Brick Mill contains a restaurant, a conference center, function space and a performance/ training center.
- The Mill Building serves as a space for artists, a museum, and has 3 apartments for clients of Alternatives Unlimited.
- The Administrative Offices of Alternatives Unlimited are also located in the mill and will contain another Art Gallery. There will be a Public Plaza where visitors may sit and dine or walk around to view the complex and the river. They also use this space to hold concerts, Farmer's Markets, and other events.
- The chief sources of revenue and utility savings that funded this project included leases, the hydropower, geothermal wells and solar panels..

- Upon renovation, the goal of Alternatives was for the property to be “energy self-sufficient and also environmentally sensitive”.

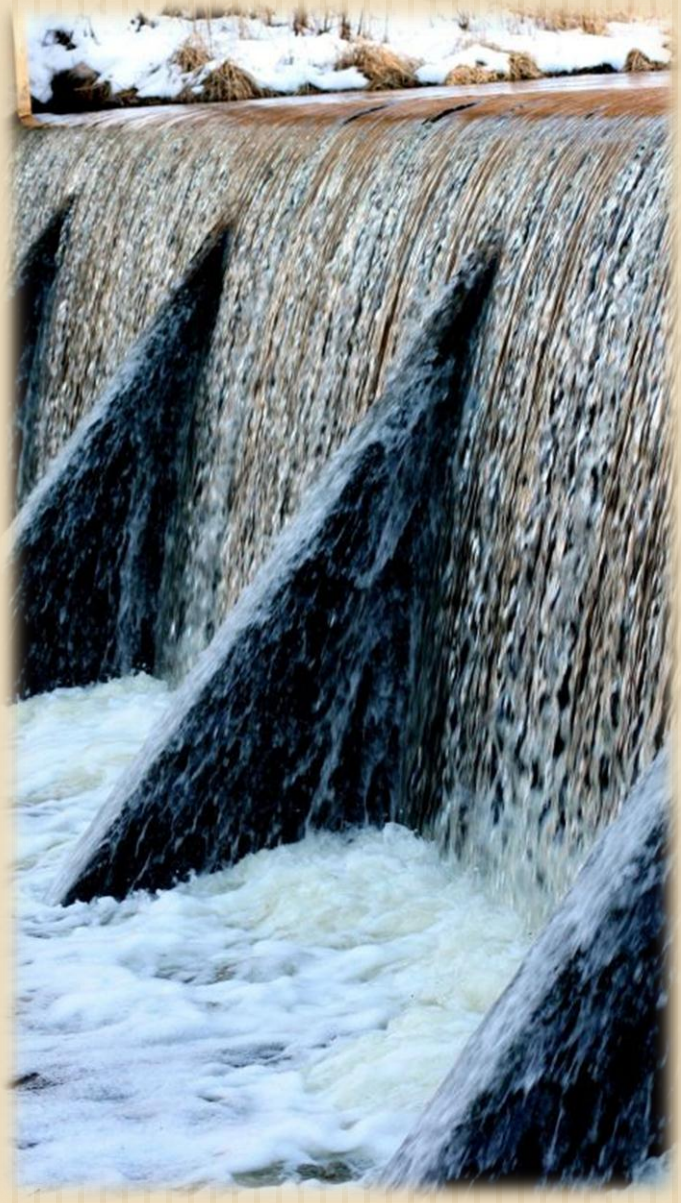
- They started by utilizing the Hydropower that has always been harnessed from the Mumford River by the Whitins. The spillway was raised 30” to provide a heavier drop of water. They installed a new turbine, and a generator will be driven that will produce 50 Kilowatts of electricity.
  - If all the power produced is not used on site, Alternatives will sell it to the Electrical Grid to reduce the region’s demand on oil and coal-generated electricity.

- Solar Panels on the roof of the brick mill produce an estimated 10 Kilowatts of electricity.

- Geothermal Wells, which have tubes sunk more than 1,000 feet below the surface into bedrock, use the constant water temperature of 55*, circulating it through heat pumps that cool the structure in the Summer and heat it in the Winter.

- All of these technologies generate about 88% of the on-site energy needs and 100% of the required heating and cooling.

- **Annual costs for electricity, heating, and air conditioning will be cut from $67,000 to $33,000.**



Green Energy

How Much Did it Cost the Developer?

Cost Breakdown in the Whitin Mills Renovation	
Renovation of space for performance center, career resource center, and restaurant	$2,121,869
Renovation of mill (housing museum, apartments, and artisan space)	1,584,478
Renovation of three-story building (housing Alternatives' administrative headquarters)	1,494,410
Site development, plaza	969,449
General conditions, contractor fees	882,237
Architectural, engineering, consulting fees	753,978
Hazardous waste cleanup	492,510
Hydrogeneration system	421,000
Contingency, insurance, fit out (painting, carpeting, etc.), and miscellaneous expenses	389,048
Geothermal systems	307,079
Renovation of forge (used for blacksmithing and glassblowing)	187,639
Photovoltaic system	102,000
LEED commissioning	52,000
Total expenses	**$9,757,697**

The project also received a $16,400 Brownfields Site Assessment award and a $160,000 Cultural Facilities Fund grant.

Worcester Shakespeare Company find new home at Alternatives Whitin Mill Complex

When Alternatives took over the Whitin Mills no one anticipated how they would make history come alive. The Executive Director, Dennis Rice, has said that the company's renovation of the mills is **"all about reciprocity"**. He goes on to say that his mutual exchange, involves sharing and enjoying for generations the rich culture left by the Whitins with all of the residents as well as clients of the community that are served by Alternatives.

Questions

- Do you feel that the often higher development costs are outweighed by the public benefits of Brownfield re-use or remediation vs. building new?
- If it were your community, would you rather contribute to a remediation project like that in Whitinsville (which was funded in part by donations from local residents), or risk that the developer is not willing to spend the money necessary to remediate and will instead use Greenfield property to build?

References

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- "Smart Growth / Smart Energy Toolkit - Mill Revitalization Districts." *Smart Growth / Smart Energy Toolkit - Mill Revitalization Districts*. N.p., n.d. Web. 18 Nov. 2012. <http://www.mass.gov/envir/smart_growth_toolkit/pages/mod-mill-redev.html>.

- "Smart Growth / Smart Energy Toolkit - The Mill Revitalization District Case Study." *Smart Growth / Smart Energy Toolkit - The Mill Revitalization District Case Study*. N.p., n.d. Web. 18 Nov. 2012. <http://www.mass.gov/envir/smart_growth_toolkit/pages/CS-mr-whitin.html>.

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