



# SHIFTING GEARS

## Driving Toward Auto Sector Property Revitalization



# Foreword

The revitalization of idled industrial properties is vital to the economic future of many communities across the country. Through partnerships among all levels of government and the private sector this revitalization can lead to improvements in public health and environmental protection. Examples of these successful partnerships can be found in the American automotive sector. While this sector is a symbol of our country's economic growth and industrial prowess, it currently is facing substantial restructuring. One significant result of the industry's restructuring is an increase in idle manufacturing facilities and properties.

Many towns and cities across the country and particularly in the Midwest grew up around automotive manufacturing facilities. As these facilities close, the economic future of communities may turn on finding successful solutions for the cleanup and revitalization of the properties left behind. The brownfields created when plants close or manufacturers consolidate and relocate often sit within the urban core of our nation's communities. The sustainable cleanup and revitalization of these brownfields properties is a priority for EPA. EPA's Brownfields, Land Revitalization, and Waste Management Programs are building partnerships with

state, tribal and local governments, as well as private sector land owners and redevelopers to address the environmental and public health issues presented by idle properties left in the wake of America's economic transformation, creating opportunities for economic revitalization.

This report provides an overview of community success stories. By building strong partnerships and setting priorities for recovery and revitalization, the public and private sectors are realizing a great deal of success in addressing idle industrial brownfields. EPA applauds these successful ventures and we look forward to leading the way toward stronger partnerships and the continued revitalization of our nation's communities.

I want to thank everyone who contributed to this report—auto manufacturers, developers, environmental professionals, communities, and federal, state and local government officials. I urge you to use this report as a catalyst to help improve the quality of life in your community.

Susan Parker Bodine  
*EPA Assistant Administrator for  
Solid Waste and Emergency  
Response*

## Cover Photos

Front cover (left to right): Gates Rubber Plant, Gas station along Route 66, Ford Rouge Plant

Back cover (left): Aerial view of Ford Rouge Plant

Back cover (right): Gates Rubber Plant

## Prepared for:

U.S. Environmental Protection Agency  
Office of Solid Waste and Emergency Response  
Office of Brownfields and Land Revitalization  
Washington, D.C. 20460

## Prepared by:

SRA International, Inc. (Contract No. EP-W-07-023)  
3434 Washington Boulevard  
Arlington, VA 22201

The City of Kenosha, WI, redeveloped Harbor Park area



# Table of Contents

Introduction ..... 2

Case Studies ..... 6

Going Forward..... 31



Underground Storage Tank removal



Denver, CO manufacturing plant



Muffler Shop redevelopment



# Introduction

## AUTO INDUSTRY BACKGROUND

The automobile, long a symbol of the American Dream, spurred economic development in the 20th century and created a complex industry across the United States. Automobile manufacturing grew into a vast array of supporting industry sectors, all centered on meeting the demands of the driving consumer. As the industry grew, it came to employ hundreds of thousands of workers and established itself as the economic hub for hundreds of United States cities. The growth of the U.S. auto industry transformed the nation's economy as well as the landscape of thousands of acres of commercial and industrial property across the country.

U.S. automobile manufacturing<sup>1</sup> reached its peak in the 1980s. In 1987, the industry employed 751,000 workers and generated annual revenue in the hundreds of billions.<sup>2</sup> Since then, plant restructuring, technological advancements in automobile assembly and manufacturing, and increased international competition are resulting in the consolidation and closing of U.S. manufacturing plants.<sup>3</sup> In addition, many of the parts used in automobile production are increasingly being manufactured overseas.

Market projections for several major U.S. car manufacturers include ongoing reductions in capacity and production, and additional North American plant closures. Each of Detroit's Big 3—General Motors (GM), Ford Motor Company (Ford) and Chrysler—are



streamlining and restructuring their operations. In 2005, GM announced a restructuring plan that includes closing four assembly plants and four stamping and powertrain plants, reducing production at three additional assembly plants, and eliminating 30,000 manufacturing jobs.<sup>4</sup> A similar plan announced by Ford in 2006 will cease operations at 14 manufacturing facilities by 2012 and reduce between 25,000 and 30,000 manufacturing jobs.<sup>5</sup>

The economics and landscape of the Midwest states are particularly hard hit by recent changes in automobile manufacturing. Between 1997 and 2002, nine motor vehicle manufacturing plants closed in U.S. EPA's Region 5 (i.e., Illinois, Indiana, Michigan,



Automobile manufacturing plant



Chrysler lakefront



Gas station along Rt. 66 corridor



Minnesota, Ohio and Wisconsin) alone,<sup>6</sup> and many became brownfield properties.

Plant closings leave a physical mark upon municipal landscapes. Underutilized, idled and often contaminated properties that need to be cleaned up and revitalized are blighting many Midwestern cities and towns. These communities often are struggling to put these properties back into productive use and rejuvenate their local economies. This report illustrates the significant impact that idled properties are having on many communities. This report's purposes are to provide background, success stories and lessons learned for municipalities dealing with these properties; illustrate the opportunities for sustainable redevelopment; and offer ideas to help reduce the impact of future plant closures.

### **AUTO INDUSTRY BROWNFIELDS: ECONOMIC AND ENVIRONMENTAL CHALLENGES**

Underutilized and idled properties created as a result of changes in in the U.S. automotive assembly and manufacturing industry share land revitalization issues common to plant closures in other industrial sectors such as public perception and liability concerns

regarding real or perceived contamination. They pose issues that local governments need to address—including blight, a variety of potential environmental contamination issues and economic hardship due to loss of jobs and tax revenue.

Often, large auto facilities involve multiple, closely grouped properties, requiring collaborative, areawide cleanup and reuse planning. Some of these idle facilities involve a variety of contaminants and pose cleanup challenges that require demolition of existing buildings and infrastructure. Such complication may add to the cost of new development and deter private sector investment. These properties also may include pockets of ongoing operations that must be addressed during assessment, cleanup and redevelopment. In addition, many parts manufacturers and service suppliers are located in clusters around assembly plants. These long active and colocated facilities present potentially significant contamination issues for local and regional governments.





Many of the supporting facilities, such as auto salvage yards, are operated by small business owners who may lack the necessary resources or information needed to address the complex environmental compliance problems associated with these properties. And though not specifically an auto sector related issue, these properties often involve multiple regulatory programs (e.g., state response programs RCRA, CERCLA) due to the complexity of the potential contaminants present.

The challenges posed by auto industry brownfields also can offer opportunities for communities, regulatory authorities, the automotive industry and other stakeholders to work together to redevelop these properties and revive local economies. This report presents case studies of successful automotive property

redevelopment projects and offers lessons learned from some successful redevelopment case studies. The case studies provide real life examples of how municipalities can navigate the complex issues associated with former automotive properties and address similar sites in their own communities. In many cases, revitalization can be facilitated by partnerships forged between communities and the manufacturers themselves.

## REGULATORY APPROACHES

Auto manufacturing facilities that managed or disposed of hazardous waste onsite often have Resource Conservation and Recovery Act (RCRA) permits and contamination at these properties may be addressed by the RCRA program. In some cases, releases at auto sector properties are addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

However, the majority of idled properties in the auto sector, particularly former automobile dealerships, repair shops and gasoline stations typically are not RCRA permitted facilities and are not contaminated to the extent that would cause them to be addressed under CERCLA. These properties, when underutilized or idle, may be brownfield properties. Brownfields properties are often assessed and cleaned up under state oversight and in accordance with state voluntary cleanup programs (VCPs). In addition, many brownfields may contain underground storage tanks.

Auto sector properties may be contaminated with a variety of contaminants in addition to petroleum, heavy metals and VOCs that one expects at auto sector properties. In addition, it is not unusual for there to be a geographic concentration of multiple brownfield properties. The colocation of these properties can require collaborative, areawide planning for revitalization. Because these challenges may be solved more easily using an integrated cleanup approach, EPA is exploring opportunities to implement a collaborative and coordinated multiprogram approach to clean up and restore the nation's auto sites in several regions.

## Components of the Automobile Manufacturing Industry

The primary and ancillary sectors within the motor vehicle industry include:

1. Assembly Plants—*Facilities where motor vehicles are assembled*
2. Parts Suppliers Clustered Near Assembly Plants—*Manufacturers of large parts including engines, transmissions, seats and large body stampings*
3. Mobile Parts Suppliers—*Manufacturers of smaller, shippable parts including electronics, glass, exhaust systems and wheels*
4. Retail and Support Sector—*Establishments that provide goods and services to the automobile industry including used and new car dealerships, auto maintenance and repair shops, gas stations, car washes and auto salvage yards*



### Old pumps remain at former gas station

Promoting a “One Cleanup Approach” to revitalization, the Agency’s goal is to facilitate accelerated cleanup schedules by integrating the requirements of different cleanup programs—CERCLA, Brownfields, RCRA, UST and state voluntary cleanup programs—while ensuring that resources are effectively coordinated, that program goals are implemented, and results are communicated to the public.

A One Cleanup Approach can promote the coordination of multiple Agency processes, streamline schedules for meeting regulatory requirements, and allow for the leveraging of resources to better address area-wide cleanups. This approach also may promote program coordination to resolve challenges and remove unintentional barriers so that contaminated properties may be revitalized and returned to protective and beneficial uses by:

- Reducing uncertainties about liability and cleanup;
- Identifying, reconciling and communicating differences among cleanup programs;
- Coordinating site investigation efforts; and
- Providing incentives for participation in long term revitalization efforts.

**EPA’s Brownfields Program**—provides funding and technical assistance to help communities identify, assess, safely clean up and sustainably reuse potentially contaminated properties.

**The Superfund Program**—manages cleanups of the nation’s uncontrolled hazardous waste sites that pose a current or future threat to human health or the environment.

**The Resource Conservation and Recovery Act (RCRA) Corrective Action Program**—requires the investigation and cleanup of hazardous releases at operating facilities. RCRA Corrective Action differs from Superfund in that Corrective Action facilities generally have viable operators and ongoing operations.

**The Underground Storage Tanks Program**—supports states, territories and other partners in the cleanup and reuse of properties contaminated by petroleum releases from USTs.



# Auto Sector Case Studies

This section highlights eight successful auto sector redevelopment projects, detailing the challenges, strategies and results of cleanup and revitalization efforts. An expanded look at two auto support industries—salvage yards and gas stations—explores their unique challenges and opportunities to local communities. In addition to the detailed case studies, several capsule stories showcase revitalization successes.

Many of these projects used a coordinated, multiprogram approach. The eight case studies outline the participation of various federal cleanup programs, state agencies, local governments, industry and private interests to successfully redevelop auto sector properties. To address a variety of auto sector property types, the case studies are organized by type, including auto assembly plants associated with Ford, GM and Chrysler and auto parts suppliers (rubber and glass). The report also includes information on revitalization efforts at related industries, including salvage yards and gas stations.

## Automobile Manufacturing and Assembly Plants:


- Baltimore, Maryland—Former GM Plant
- Allen Park, Michigan—Former Ford Landfill
- Kenosha, Wisconsin—Former Chrysler Plant
- Anderson, Indiana—Former GM Plant Properties
- Dearborn, Michigan—Former Ford Plant

## Automobile Parts Manufacturing Plants:

- Fitchburg, Massachusetts—Former Hope Rubber Plant
- Ford City, Pennsylvania—Former Pittsburgh Plate Glass Industries Plant
- Jackson, Michigan—Former Goodyear Tire and Rubber Plant

## Related Industries:

- Salvage Yards
- Gas Stations and Underground Storage Tanks

A large, multi-story brick building with a blue-tiled roof and a fountain in the foreground. The building has multiple stories with many windows and a prominent blue-tiled tower. In the foreground, there is a large, circular fountain with several jets of water spraying upwards. The fountain is surrounded by a low wall and some landscaping. The background shows a clear sky and some trees.

Kenosha, WI



## Streamlined administrative procedures and materials recycling lead to timely and responsible cleanup and redevelopment

### BACKGROUND

For 68 years, the Baltimore GM assembly plant produced every type of GM car from the Impala to the Pontiac GTO. The 182 acre property, located in southeast Baltimore adjacent to the Seagirt Marine Terminal, was the site of a 3.2 million square foot assembly plant. GM closed the plant in 2005. This former automotive property is now slated to become a \$150 million business park with sustainable project elements, including the recycling of 96 percent of demolition debris and the construction of a Leadership in Energy and Environmental Design (LEED) certified building.

### MEETING THE CHALLENGE

With the plant closure, GM knew it had to satisfy its state and federal hazardous waste management obligations. GM met with EPA Region 3 and Maryland Department of Environment (MDE) representatives to assure them that GM would retain a developer who would take on responsibility for cleaning up the property as part of the redevelopment, and that GM would stay involved in the process to assure the developer met its commitments. Upon selecting a developer in January 2006, the team

Demolition of the former GM Baltimore Plant



*“Although it may*

*the impacted neighborhoods, EPA can streamline the environmental cleanup process so redevelopment takes less time to complete, but still ensure the highest environmental standards.”*

—Donald S. Welsh,  
EPA Mid-Atlantic Regional Administrator on the former  
GM plant redevelopment effort

faced several complex challenges to complete the project. These challenges included a short timeframe on preacquisition due diligence, differences in the sitewide RCRA Corrective Action and MDE Voluntary Cleanup Program objectives, and a schedule that allowed only 18 months to complete cleanup and begin new construction.

### CLEANUP AND REVITALIZATION STRATEGY

The strategy for the Chesapeake Commerce Center redevelopment project adopted by GM and the development team focused on a collaborative approach with EPA and MDE. The developer, Duke Realty, created a comprehensive cleanup matrix and master schedule, and approached EPA and MDE with a proposal to conduct a facility led RCRA cleanup approach. The state and federal regulators responded in kind with collaboration and streamlined administrative procedures, setting

### Keys to Success

Collaborative public-private partnership resulting in streamlined administrative procedures, allowing complete cleanup and initial construction within 18 months

Cleanup strategy that includes a waste reduction method resulting in 96 percent of materials recycled estimated at approximately 98,000 tons paid for the entire cost of building demolition





Aerial view of the former GM Baltimore property

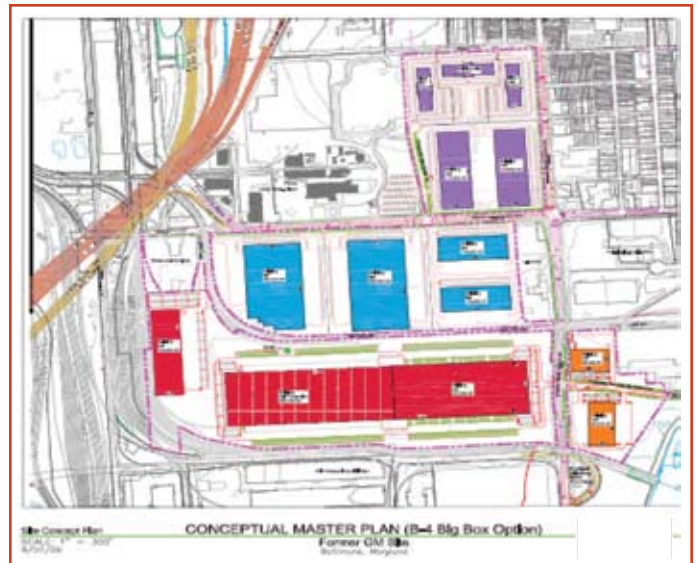
up an intergovernmental team that met intensively and repeatedly early in the process. This collaborative public-private partnership focused on the cleanup matrix and master schedule, as well as the commercial reuse scenario. The focus was to drive decisions on remedy, and institutional and engineering controls toward the agreed upon reuse, while meeting an aggressive schedule for redevelopment. All parties involved committed to conducting early, substantial community and stakeholder outreach on the property redevelopment.

In addition to the cleanup work, the developer took its environmental commitment one step further. By dismantling the buildings and structures onsite, the developer chose a waste reduction method that resulted in recycling 96 percent of all nonhazardous building materials and offset the total cost of building demolition. Former pits, trenches and basements were filled with materials processed by an onsite concrete crusher. In addition, the scrap metal was sold as a commodity and shipped by truck or rail across the United States. The volume of recycled materials from the deconstruction is estimated to be 98,000 tons. The energy savings from recycling these materials is equivalent to removing nearly 1,000 cars from the roadway for one year.

## RESULTS

Groundbreaking took place in June 2007. The first structure will be a certified LEED building utilizing recycled and regional materials, incorporating energy and water efficiency into the building design, and maximizing greenspace onsite. Over the entire Chesapeake Commerce Center project, Duke Realty will increase the greenspace by 20 percent, thus reducing stormwater runoff, minimizing heat island effects and adding to the overall green landscaping and aesthetics of the area including planting 2,200 trees.

When the entire redevelopment is complete, there will be 12 to 20 new buildings totaling between 2.5 and 3 million square feet of commercial space that will be used for bulk distribution, offices and research and development. The project is expected to create thousands of new jobs over the next ten years.



Master Plan concept for former GM plant

## Former Federal Engineering Building—Detroit, MI

The former 80,000 square foot Federal Engineering Building located in the Highland Park Neighborhood in Detroit, Michigan was once used to manufacture dies for automotive parts. It now is a key part of the Highland Park revitalization project. This project includes a mixed redevelopment with residential housing, conference facilities, a community center and other amenities.

Starting in 1940, Federal Engineering operated a tool and die company on the property, which manufactured heavy metal forms of dies for stamping metal into automobile parts such as bumpers, hoods and quarter panels. Due to the declining U.S. automotive industry, Federal Engineering ceased operations in 1984. Once a vital and productive part of the community, the property became blighted and contaminated, and presented a barrier to community revitalization.

HOPE Revitalization—a nonprofit corporation—used funding from an EPA Brownfields Cleanup grant to clean up and restore the former automotive property. HOPE Revitalization integrated environmental, economic and community goals into its sustainable reuse plan for the property. HOPE elected to reuse an urban site; an antidote to urban sprawl and development of open space. To reduce the environmental impact

of construction and demolition waste, HOPE Revitalization incorporated construction and demolition (C&D) waste reduction strategies into the cleanup plan. Approximately 1,200 tons of materials (such as steel) and over 13,000 gallons of liquid waste water were recycled or reused—diverting these materials from landfills. As a result, \$150,000 or 20 percent of the total project costs were saved through material reuse and the organization avoided significant disposal costs, keeping the project cost competitive.

The cleanup of the Federal Engineering Building was the first phase of a five phase revitalization strategy. This effort resulted in the creation of a parking facility that in turn paved the way for the project's second phase, which included the construction of the Village of Oakman Manor (VOM). VOM is a \$6.2 million 55 unit apartment building for low income seniors that was completed in February 2007 and is now fully occupied. These accomplishments resulted in the designation of the area as a “Cool Cities Neighborhood” by the state, and an award of a \$100,000 grant that was used to fund the third phase of the project, the building of a community park. The last two phases of the Highland Park Neighborhood revitalization project include the addition of senior housing and completion of the Bell Building.

For more information go to:

<http://www.focushope.edu/default.htm>



The Federal Engineering Building before cleanup and demolition activities

## *Green retail and recreational center on former Ford landfill promotes sustainable and environmentally friendly practices*

### BACKGROUND

Originally a clay quarry, the Ford Motor Company opened the Ford Allen Park Clay Mine Landfill in the 1950s as a disposal site for its manufacturing wastes. Certain characteristics of the industrial waste landfill, including limited settlement and minimal offgassing, made this site favorable for redevelopment. Ford devised a strategy to close and cap the landfill and develop the site as the Fairlane Green retail center. Ford is working closely with the Michigan Department of Environmental Quality (MDEQ) to ensure the long term integrity of the property.

Photos Courtesy of: Ford Land



### MEETING THE CHALLENGE

The Allen Park project is an example of successful redevelopment, despite the environmental challenges generally posed by landfill properties. Cleanup and redevelopment activities had to account for site stabilization, landfill cap protection, and reinforcement of the landfill slope. The MDEQ and the City of Allen Park provided \$30 million in tax increment financing to reimburse Ford for the costs associated with these landfill development challenges. Under a master deed, Ford maintains ownership of the original, subsurface landfill and is permitted to sell development rights of the surface land.

Construction of the Fairlane Green retail center on the former Ford Allen Park Clay Mine Landfill





Native landscaping at the new retail center

## CLEANUP AND REVITALIZATION STRATEGY

Ford chose a revitalization approach that emphasizes sustainability and environmentally responsible development. The design for the Fairlane Green retail center focuses on maximizing the preservation of greenspace, enhancing its appeal for Allen Park citizens. The final design develops only 4,000 square feet per acre, rather than the 10,000 square feet of retail space per acre typical of other shopping centers.

The environmentally responsible redevelopment of the Allen Park landfill property includes: irrigation for the property that will be supplied by storm water rather than drawn from municipal water sources; landscaping that will facilitate coexistence with wildlife; retention ponds for runoff that will function similarly to wetlands and create natural wildlife habitats; and energy consumption that will be reduced through the use of energy efficient utilities. Some of these utilities include high efficiency heating, cooling and lighting equipment, white roof membranes, and low flow water sinks and toilets.

Buildings on the new redevelopment will feature additional environmental enhancements, including reflective roofing to save energy and green outer walls that use plants to reduce heat and provide natural habitation. Though Ford sold the first phase of the

project to the Archon Group, Ford remains significantly involved in the construction, geotechnical analysis and environmental aspects of the development.

## RESULTS

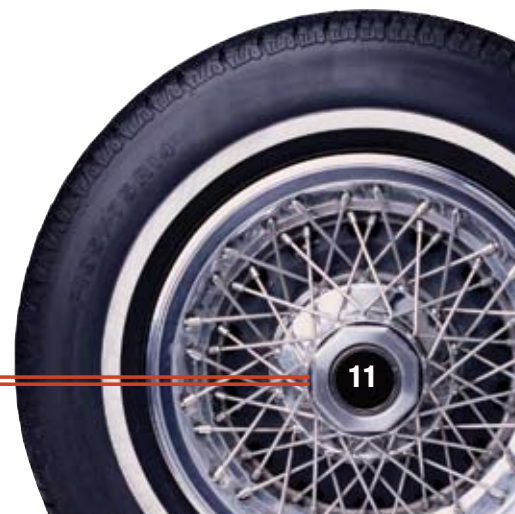
The Allen Park project was recognized as an outstanding brownfield redevelopment project as the winner of a Phoenix Award in 2007. Once completed, Fairlane Green will apply for certification as a green building through the U.S. Green Building Council's LEED program. In addition to meeting environmental goals, the project will contribute to the revitalization of the local economy. The project is expected to generate nearly 2,000 permanent jobs, as well as bring dining, shopping and recreation outlets for Allen Park residents.

### Keys to Success

The area is 60 percent less dense than the average retail development—sets aside two-thirds of its total space for redevelopment of greenspace and includes a 43 acre park and 3.5 miles of trails

Uses industry best practices for green projects—provides rainwater collection for irrigation; constructs bio-swales to collect runoff and provide natural habitat; and utilizes green screens on building walls to produce oxygen and reduce heat

Promotes environmental sensitivity in its retail tenants—Target will use green construction techniques, including skylights, to effectively control energy usage



## Community involvement key to Kenosha lakefront revitalization

### BACKGROUND

The City of Kenosha, Wisconsin is located along Lake Michigan between Chicago and Milwaukee. Situated along the city's waterfront is a 69 acre property known as the Harbor Park area. This property was a Simmons Mattress manufacturing plant from 1870 to 1960. In 1960, American Motors Corporation (AMC) opened an auto manufacturing plant at the property. In 1987, Chrysler purchased AMC, only to close the facility in 1988. As a result of the plant closing, 5,000 people lost their jobs and the Harbor Park area became blighted by the remnants of a demolished auto plant. In 1994, the City of Kenosha purchased the property for \$1, paving the way for redevelopment along the Lake Michigan waterfront.

### MEETING THE CHALLENGE

The City of Kenosha partnered with the Wisconsin Department of Natural Resources (DNR) when redeveloping the property, which was contaminated with heavy metals, petroleum and polychlorinated biphenyls (PCBs). The City followed the guidelines set by the DNR through its voluntary cleanup program, (Remediation and Redevelopment Program), for the cleanup of brownfields. In addition, the city partnered with the Urban Land Institute (ULI) to develop a redevelopment plan that accurately met the community's vision of an accessible and livable waterfront development. The city spent \$18.5 million cleaning up the property and improving necessary infrastructure, including street construction and the installation of street lights in the Harbor Park area.



*"The partnership with the state...was very important. The willingness of DNR to look at things with a different perspective... enabled us to achieve the Harbor Park Redevelopment, one of the first brownfields redevelopment in Wisconsin."*

—Mayor Antaramian



Demolition of the Former Chrysler Plant

The redeveloped Harbor Park area



### A new condominium development at Harbor Park



### CLEANUP AND REVITALIZATION STRATEGY

The centerpiece to the cleanup and revitalization strategy was public involvement throughout the project. Once the City and the Mayor, working with ULI, developed basic redevelopment plans, the city started the community visioning process by holding two citywide public forums and numerous staff presentations to discuss the residents' views on redevelopment. In addition, the city taped the public meetings and made them available to the public for those who were unable to attend. As a result of the community driven process, nearly 100% of the community supported the Harbor Park redevelopment project and in turn the redevelopment project benefited from the community's suggestions.

### Keys to Success

Development and implementation of a public participation process that created a redevelopment project with nearly 100 percent community support

Strong green infrastructure component including pedestrian and bike paths, open space and parks that promote linkages to downtown, and access to public amenities including the Kenosha lakefront

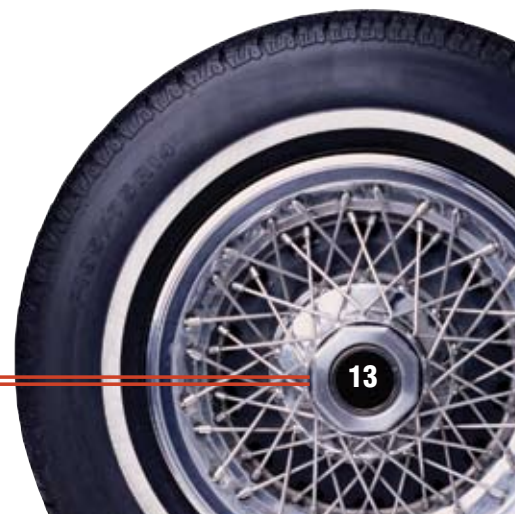


### RESULTS

HarborPark, located on the shores of Lake Michigan, is now home to upscale condominiums, walking and biking trails, streetcar services to downtown, a marina, museums and much more. In addition, redevelopment provided significant "green infrastructure" to the city. As a result of redevelopment, the value of the property increased \$50 million from 1989-2003, while nearby property values increased by more than \$13 million. In addition, 22 jobs were created and the improved harbor redevelopment increased property taxes by nearly \$900,000 in 2003. After realizing the benefits that redevelopment of HarborPark provided for the city, Kenosha's Mayor continued promoting brownfields redevelopment throughout the city.

### PROJECT FUNDING SOURCES

- Federal Transit Administration
- City of Kenosha
- Wisconsin Department of Commerce
- Various other public sources



## *Collaboration and an innovative redevelopment agreement revitalize a community*

### BACKGROUND

For most of the 20th century, Anderson, Indiana was a booming economic and industrial area. GM and automotive parts manufacturing employment opportunities reached their peak in the early 1970s and at one time provided more than 27,000 jobs in Anderson. Today, GM has divested nearly all of its interests by selling operating businesses, shuttering, and in some cases completely demolishing, its former manufacturing facilities in Anderson. In addition, one of GM's spin off companies, an automotive lighting manufacturer, Guide Corporation, shuttered its Anderson plant at the end of 2006, eliminating 1,300 jobs. This closing, along with the anticipated 2008 closing of the last Delphi facility in Anderson, marks the end of a lengthy exit process by GM and automobile manufacturing. Over the years, these closings resulted in the relocation or complete elimination of thousands of well paying jobs in Anderson, a link that directly corresponds to a consistent trend of declining population in the community. These plant closures also resulted in a \$1.2 million decrease in the annual tax base for the community.



Demolition of the F.C. Cline Building

### Keys to Success

Agreement between the city and developer provides a win-win for both parties—as the developer creates more job opportunities, it retains more profit from the development

Establishing a partnership with GM resulted in a mutually beneficial arrangement that spreads the risk among GM, the city, and redevelopment parties, and allows GM the ability to oversee redevelopment plans



### MEETING THE CHALLENGE

The City of Anderson's future will depend in large part on the revitalization of these former GM properties. Historically, the relationship between the city and GM was somewhat contentious regarding these properties. However, new mayoral leadership in 2004 turned the tide and began a period of positive and collaborative partnership between the city and GM. City government made brownfields redevelopment a priority and took the lead in collaborating with GM to clean up and redevelop former manufacturing properties.



Prime Battery site before demolition





Prime Battery site after demolition activities

## CLEANUP AND REVITALIZATION STRATEGY

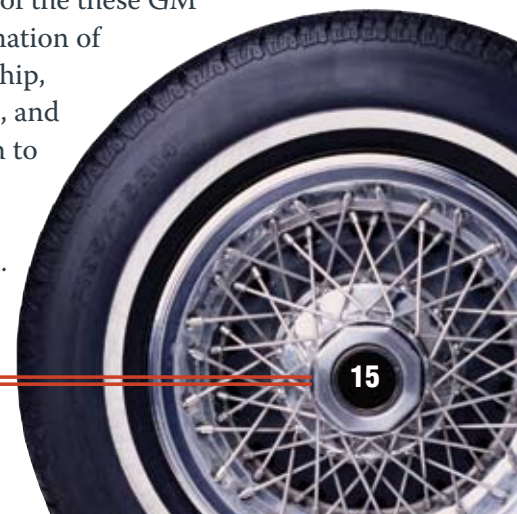
GM agreed to transfer 300 acres located south of the downtown area to the city in November 2006. Portions of this property are subject to a RCRA corrective action remedy that was approved prior to the transfer and installed shortly after, thereby preparing the property for potential reuse. Environmental investigations and remedy implementation in other areas continue to be conducted by GM and reviewed by the state agency. The sales and transfer agreement creates a sophisticated arrangement under which risk of contamination is shared among GM, the city and redevelopment parties. The agreement also prohibits residential reuse under institutional controls and grants GM the ability to review and consent to redevelopment plans to ensure that reuse is consistent with the agency approved remediation.

In August 2007, the City of Anderson began working with a brownfields redevelopment firm

to aggressively redevelop these properties for new commercial and light industrial economic investment. The redevelopment agreement includes an innovative approach under which the developer will share profit revenues with the city on a scale determined by how many local jobs are created as a result of the new development.

## RESULTS

The city is optimistic about its prospects for economic revitalization, as a result of its partnership for the redevelopment of these GM properties. The combination of persistent local leadership, collaboration with GM, and an innovative approach to redevelopment makes a positive difference in the future of Anderson.



## *Sustainable practices revitalize outdated automobile assembly plant*

### BACKGROUND

The Ford Rouge Plant stands as a marvel of the automobile industry. Construction began in 1917 and by the 1930s it was the largest industrial complex in the world. The facility once included 93 structures and employed over 100,000 people. It was a self-sufficient manufacturing complex, containing a power plant, glass plant, cement plant and byproducts plant, enabling cars to be built from scratch. However, years of steel, glass and automobile production and assembly left environmental contamination. After World War II, demand for the plant's output decreased; some automobile operations were transferred to other Ford plants and portions of the plant were sold off. In the 1990s, Ford turned its attention back to Ford Rouge with the intention of renovating the truck plant and creating a significant sustainable manufacturing effort at the site.

### MEETING THE CHALLENGE

Today the Ford Rouge Plant is a pinnacle of ingenuity and innovation using sustainable practices in and around the plant itself. The truck plant employs 7,000 workers and produces the Ford F-150. Many areas of the 600 acre plant are in the midst of a \$2 billion dollar redevelopment and renovation. The truck plant maintains a living roof atop the building and sky lights that provide natural light to the assembly plant floor.

To encourage nature to thrive where manufacturing once did, there are approximately 20,000 honeybees housed in hives that help attract birds, insects and small animals to the grounds. In addition, over 100,000 perennials, shrubs and trees were planted on the property. Ford also is testing a phytoremediation process to attempt to remove and detoxify environmental pollutants from soil. In terms of building practices, over half of the onsite Visitor's Center is made from recycled materials. Photosensory cells above its main entrance capture sunlight and convert it to usable energy.

Aerial view of the Ford Rouge Plant's green roof



Ford's sustainable green roof is composed of nine varieties of sedum

Photos Courtesy of: William McDonough and Partners via Green Roofs for Healthy Cities

### CLEANUP AND REVITALIZATION STRATEGY

Onsite environmental contamination included semi-volatiles and coal distillates from historical coke making operations; coal, microscopic coal particles known as coal fines, and heavy metals from steel making operations; and petroleum and non petroleum hydrocarbons from heavy manufacturing operations. Under oversight of the Michigan Department of Environmental Quality (MDEQ), voluntary cleanup measures employed during the remediation of the plant involved: comprehensive solid waste management unit identification; site investigation; source removal; building demolition; phytoremediation; institutional controls; monitored natural attenuation; and innovative storm water management techniques. For an example of the last point, the plant operates a 12,500 gallon cistern that collects rainwater for irrigation and other purposes throughout the plant complex.



Shrubs, grasses and other vegetation surround Ford's F-150 Truck Plant in Dearborn, Michigan



Rows of trees greet visitors to the truck plant at the Ford Rouge site

Most notably, the 10.4 acre living roof, installed in 2003, is the symbol of change at the plant. The roof is composed of sedum, a plant that absorbs water and carbon dioxide and emits oxygen. The roof provides insulation to the truck plant below and acts as a natural filtration system for storm water runoff. While the cost of a green roof is more than a traditional roof, it is expected to last twice as long.

## RESULTS

The sustainable manufacturing practices in place at the Ford Rouge property partially offset the carbon footprint of industrial manufacturing that goes on inside the plant. The benefits of the living roof are increased energy savings through insulation of the truck plant and a roof that is more durable than a traditional roof. Ford won numerous awards for the project and complex design, including the Gold LEED Award from the U.S. Green Building Council, and the Clean Air Excellence Award from EPA. As it was in its manufacturing heyday, the plant is once again a tourist attraction; visitors come from all over to tour the automobile plant, learn about its history, and see the possibilities of sustainable development and practices.

## PROJECT FUNDING SOURCES

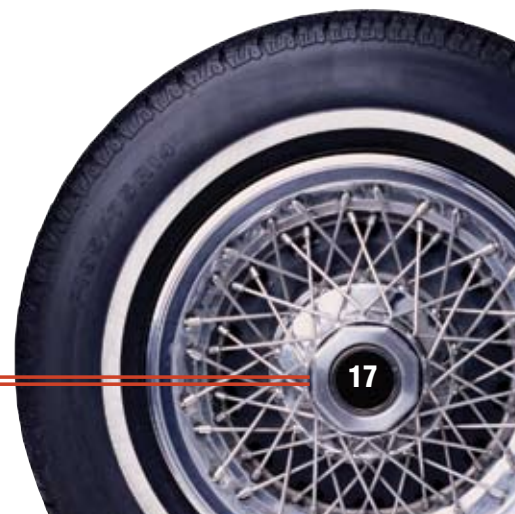
Ford Motor Company

## Keys to Success

Reusing and recycling older buildings in ways that support both industrial manufacturing and sustainable practices

Fostering natural habitat to prosper in an industrial setting

Working under MDEQ oversight to clean up truck plant site



## ***Committed local government and community collaboration transform former rubber plant into a riverfront park***

### **BACKGROUND**

Situated along the Nashua River in Fitchburg, Massachusetts approximately 50 miles from Boston, the Hope Rubber factory produced plastic and rubber parts until its closure in the 1990s. The closure of this facility coupled with the closure of a General Electric (GE) plant in 1998 resulted in the loss of 600 jobs and an increased number of deficient and vacant buildings throughout the city, including the 35,000 square foot Hope Rubber factory. With an unemployment rate nearly double the national average in 1999 and with almost 12 percent of the population below the poverty line, this troubled community was in need of help.

### **MEETING THE CHALLENGE**

The GE shutdown spurred a needed urban renaissance within the city. By May 1998, a complete Urban Renewal Plan was prepared and ready for implementation. The selective renewal program targeted urban brownfields including the former Hope Rubber factory located at 40 Commercial Street. To address contamination at this 1.6 acre property, the city Planning Board initially used a \$200,000 EPA Brownfields Assessment grant to hire an environmental contractor to perform Phase I and Phase II environmental assessments and conduct risk analyses. This work confirmed the need to address surface soils contaminated with lead, arsenic and asbestos, and four underground storage tanks containing fuel oil and liquids.

Fitchburg's two acre Riverfront Park



*"The Fitchburg Riverfront Park provides people with a place to enjoy the outdoors and the river as a community—it has proven that it has the potential to draw people back downtown."*

—Lisa Wong  
Fitchburg Economic Development Office

### **CLEANUP AND REVITALIZATION STRATEGY**

The vision of a riverfront park became a reality through a collaborative effort between the city and its residents. The Riverfront Park Citizens Committee composed of business leaders, residents and government officials was formed to guide the project. The Committee undertook both small and large tasks, including small details such as bench and street lamp preference to the huge task of selecting an architectural design firm.

Phase 1 of the project is complete; it included removing 155 cubic yards of contaminated material, replacing 18 inches of clean cover material, paving walkways, installing lighting, fencing and benches, and planting grass, trees and other greenery. The Executive Office of Environmental Affairs and the Fitchburg Redevelopment Authority provided the \$530,000 in funding needed for Phase I of the project. Phase 2 is estimated to cost \$625,000 to build the park and renovate the Old Iron Bridge for pedestrian use.

### **Keys to Success**

Collaborative effort that included residents in every aspect of the cleanup and redevelopment

Assessment activities moved forward in a cost effective manner using EPA Brownfields Assessment grant which allowed Fitchburg Redevelopment Authority to locate areas of contamination hot spots



## Gates Rubber Plant—Denver, CO

Once dubbed the “West’s Biggest Factory,” the Gates Rubber Plant is slated to become one of Denver’s first mixed use, mixed income, transit-oriented developments. Established in 1911 along the South Platte River in central Denver, Colorado, the 85 acre rubber plant produced belts, hoses and tires for the automobile industry. Gates closed the plant in 1996 after 85 years of operation. In December 2001, Cherokee Denver, an affiliate of Cherokee Investment Partners and experienced brownfield redeveloper, purchased 50 acres of the property. Cherokee plans to create a \$1 billion development that functions as a minidowntown and destination point complete with residential, office, retail and entertainment venues, parks and public plazas, as well as access to a light-rail station and a park and ride.

Cherokee enrolled the former Gates Rubber property in Colorado’s Voluntary Cleanup Program (VCUP) and since 2002 is actively cleaning up the property to address contamination after years of industrial use. As of winter 2008, Cherokee received three VCUP plans resulting in No Action Determinations (NADs) with one other pending close out and three VCUP plans currently under review. Cherokee estimates the project’s cleanup costs to be approximately \$24.5 million with demolition costs estimated at about \$10.5 million. With a mission of sustainable development, Cherokee has a goal of recycling 95 percent of the demolition debris and has already reused 21,900 tons of concrete and nearly 4,000 tons of asphalt onsite or elsewhere to make new roads, while salvaging almost 2,150 tons of steel. As



The Gates Rubber Plant prior to cleanup and demolition activities located next to light rail and close to downtown Denver

one of the first properties in the United States to be selected as part of the Leadership in Energy and Environmental Design Neighborhood Development (LEED ND) pilot program in 2007, the project will incorporate smart growth principles and green building design. In addition to these sustainable elements, the project will include affordable housing and quality jobs in exchange for \$126 million in city subsidies.

The first phase of the 10-15 year redevelopment project is underway and includes 410 market rate and 60 affordable rental units. Phase II of the project, Metropolitan Gardens, will include one million square feet of retail space, including Robert Redford’s fourth Sundance Cinema, two hotels, 610,000 square feet of office space, 850 apartments and 1,300 condos, as well as parks, pedestrian plazas and a major transportation hub.

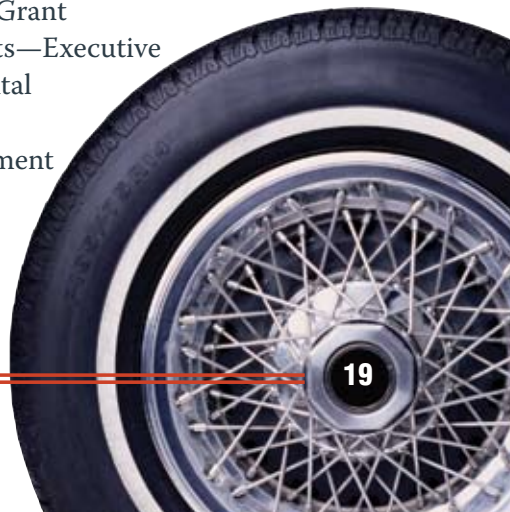
For more information go to:  
<http://www.cherokeedenver.com/>

## RESULTS

Riverfront Park was completed in August 2003 and is now the key element in the city’s proposed \$43 million Fitchburg Urban Revitalization Program. What was once an urban eyesore and contaminated property was transformed into a beautiful two acre park complete with outdoor theater, river promenade, nature trails and expansive green lawns.

## PROJECT FUNDING SOURCES

- U.S. EPA Brownfield Grant
- State of Massachusetts—Executive Office of Environmental Affairs
- Fitchburg Redevelopment Authority
- Urban Self-Help Grants



## Partnerships vital to Ford City's revitalization efforts

### BACKGROUND

Pittsburgh Plate Glass Industries, Inc. (PPG) established itself in Ford City, Pennsylvania in 1887 and at one time employed 5,000 workers, making it the largest plate glass factory in the world. By the time the company ceased operations in Ford City in 1993—following a decline that started in the mid 1960s—nearly 45 percent of Ford City's population left the area. The 57 acres that were home to the idle glass plant represented Ford City's only developable land. The former PPG facility has been redeveloped into new office space.

### MEETING THE CHALLENGE

Seven acres of the glass plant land were acquired by Ford City in 1999. Prior to ownership by the city, the seven acre parcel was leased by AMCO for a foundry operation. AMCO filed for bankruptcy in 1995 and abandoned the property, leaving behind three empty buildings and unknown levels of contamination from more than a century of industrial uses. To address the contamination issues, the city entered the property into the state's VCP. The Pennsylvania Department of Environmental Protection (PA DEP) then performed a preliminary property assessment. Following a Phase I site assessment, additional site investigation was conducted and a cleanup plan was completed.

An EPA Brownfields Assessment grant, awarded to Ford City in 1998, provided funding for more detailed



Construction activities at the former PPG Factory

assessments of the former AMCO property. These assessments resulted in the discovery of arsenic and lead in the soil and VOCs in the ground water. The grant also assisted Ford City in ongoing negotiations with PPG to turn over the remaining 50 acres to the town, providing it with the entire 57 acre property for cleanup and redevelopment.

### CLEANUP AND REVITALIZATION STRATEGY

Ford City Borough created the Greater Ford City Community Development Corporation in 1999 to administer grant funding and oversee the redevelopment of brownfields. Quarterly public meetings were held to allow community participation in determining reuse. The result was a plan for the new Heritage and Technology Park (HAT), which when complete will feature more than 90,000 square feet of commercial, office and light industrial space within PPG's former machine shop. To make the HAT a reality, the city needed more than \$1 million for cleanup and more than \$4 million to restore existing buildings on the seven acre property. The city successfully leveraged funding from numerous public and private entities, including EPA, the Department of Housing and Urban Development, PA DEP, the Economic Development Administration, U.S. Steel, and the U.S. Army Corps of Engineers.



Site of the former PPG Factory ready for redevelopment



The new Heritage and Technology Park in Ford City

## RESULTS

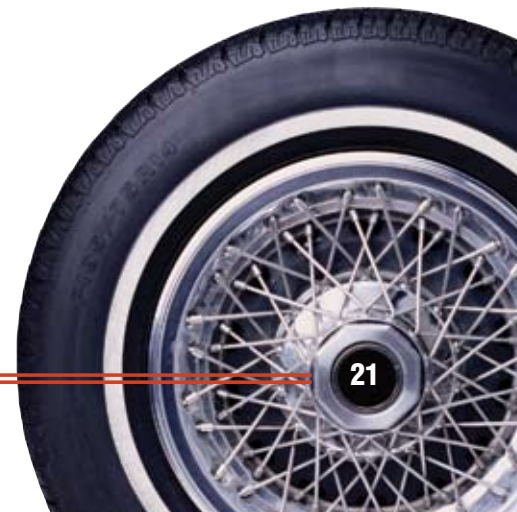
The redevelopment of the original seven acres is now complete and home to OEM Shades, a window blind manufacturer. Another building was redeveloped on the former AMCO Shop 2 property, originally the PPG machine shop. Currently, Shop 2 has several tenants occupying the space, with other tenants on their way. Because of these efforts, Ford City was invited by the Pittsburgh Federal Executive Board to demonstrate successful partnerships between the federal government and grass roots revitalization efforts.

## PROJECT FUNDING SOURCES

- Pennsylvania Department of Environmental Protection
- U.S. Housing and Urban Development Economic Development Initiative
- Economic Development Administration
- U.S. Steel
- U.S. Army Corps of Engineers
- U.S. EPA Brownfields Assessment Grant

### Key to Success

Leveraging resources to successfully redevelop a former plate glass factory using local, state and federal partners



### *Strategic financial incentives lure state-of-the-art power plant to a former tire manufacturing property*

#### BACKGROUND

The Kinder Morgan Jackson Power Facility redevelopment project converted a former Goodyear Tire & Rubber Manufacturing facility into a \$250 million, state of the art, natural gas fired and 510 megawatt electric power generation facility in Jackson, Michigan. Built in the 1930s, Goodyear purchased the plant in 1936. It operated the plant until an explosion in 1983 resulted in \$4.5 million in damage and forced the company to close its doors in 1984. Between 1984 and 2000 the 59 acre facility sat dormant and the one million square foot onsite structure deteriorated to a state that rendered it unusable.

#### MEETING THE CHALLENGE

During its 47 years of operation, Goodyear used and stored large quantities of oil, fuel, solvents and other hazardous substances needed for manufacturing tires onsite. The facility also operated 12 high-voltage transformers that resulted in the need to manage PCB contaminated oils during the cleanup process. In 1996, the City of Jackson received a site assessment grant from the State of Michigan to identify potential environmental concerns associated with the property.

The property assessment revealed the buildings to be in poor condition. There was evidence of widespread vandalism at the property, including broken glass, graffiti, holes in chain link fencing and piles of rubbish. In addition, asbestos containing materials were found throughout the buildings. There were 55 gallon drums—some that still contained chemicals—on the property as well as stained soil, oil filled capacitors, PCB transformers, and oil and grease stained floors.

#### CLEANUP AND REVITALIZATION STRATEGY

In the late 1990s, both the City and County of Jackson created a Brownfield Redevelopment Authority to promote redevelopment of brownfields areas in and around Jackson. To foster the redevelopment of the Goodyear property, the city created a Renaissance Zone as an incentive for Kinder Morgan to develop the property. Renaissance Zones are designed to provide communities with powerful market based incentives to spur new jobs and investment. In addition, businesses that locate in Renaissance Zones are subject to virtually no state or local taxes. The creation of the Renaissance Zone and the collaborative partnership that the local

Construction activities at the Kinder Morgan Jackson Power Plant





government offered Kinder Morgan were key factors in attracting the company to the Goodyear facility. The location provided readily available access to the existing transmission grid, natural gas and water supplies. The incentives for redeveloping the Goodyear facility helped ameliorate the demolition and environmental challenges faced at the property.

By December 2000, Kinder Morgan purchased 31 acres of the 59 acre property. Kinder Morgan took advantage of Michigan's voluntary cleanup program for brownfields to ensure protection from liability for previous releases at the property. The company worked with the state to develop a strategy to contain the contamination using a risk based approach resulting in the property be cleaned to standards acceptable for industrial use.

The state program provides an innovative approach to tackling the barriers to reusing brownfield properties. Under the Natural Resources and Environmental Protection Act, the state can assess and remediate contaminated sites. The program allows a risk based approach to cleanup, relying on future use to determine the degree of remediation needed to support redevelopment. Institutional controls ensure that future owners and operators of contaminated sites are aware of the environmental conditions and abide by the land use restrictions for properties under Michigan Law.

### Keys to Success

Establishment of a Renaissance Zone that provided an exemption from state and local taxes as a financial incentive to draw a developer to this property

Partnership between the state's economic development and regulatory agencies and the developer

Creation of Brownfields Redevelopment Authorities at the municipal and county level that provide focus and resources that overcame previous barriers to redevelopment



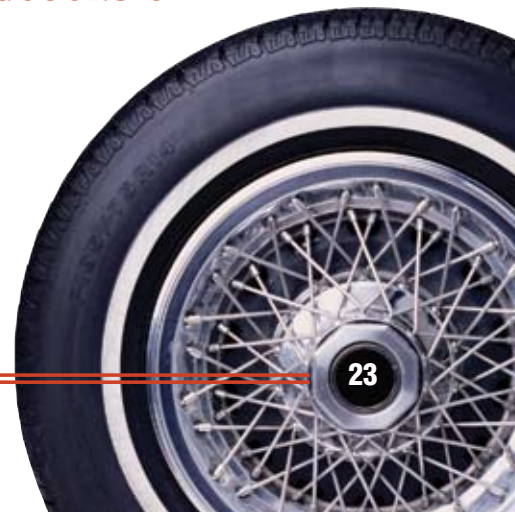
Aerial view of the redeveloped Goodyear property

### RESULTS

In July 2002, the Kinder Morgan gas fired electric power generation facility became fully operational. The plant, designed to operate at full capacity during times of peak demand, helps meet the growing energy shortfall in Michigan. In addition to supplying the state with power when it is needed most, the \$250 million project is a tremendous asset in revitalizing the local community and brings significant economic benefits to the economy. Redevelopment of this brownfield brought approximately \$50 million in local labor and \$15 million in materials during the construction phase of the project. As a result of facility operation, 15 of the 23 new jobs went to local residents. Additionally, local infrastructure was improved—approximately \$700,000 went to water and sewer upgrades and connections, and Consumers Energy upgraded the power distribution structure. These improvements benefit the community and the greater geographic area.

### PROJECT FUNDING SOURCES

- Kinder Morgan
- Consumers Energy
- State of Michigan
- City of Jackson
- Jackson County



## *Former neighborhood eyesores become community assets*

### BACKGROUND

Salvage yards—where vehicles are dismantled for reusable parts and fluids, and the remaining materials are sold as scrap—are a prime example of recycling and reuse in the country. Automotive recyclers play a significant role in rebuilding, recovering and reselling usable parts and recycling materials. Auto recycling decreases the amount of scrap materials disposed in landfills. Every year, about eight million cars and five million trucks are recycled at one of the more than 7,000 auto salvage yards nationwide.

Unfortunately, the automobile recycling processes used at salvage yards may result in negative impacts on the environment. Many salvage yards contain rusting cars, piles of tires, and scrap metal. Salvage yards can be aesthetically unattractive as well as provide environmental challenges due to the types of wastes handled.

### IMPACTS OF SALVAGE YARDS ON COMMUNITIES

Automotive scrap yards tend to be owned and operated by small businesses. Compliance with environmental regulations may present a challenge for these small businesses. The types of hazardous substances frequently found at salvage yards include: petroleum based products including oils, lubricants, fuel, antifreeze, brake fluid, steering fluid, freon or



New flooring business on the former National Auto Wrecking Co. property

### Best Management Practices at Florida Salvage Yard Properties

In 2002, the Florida Department of Environmental Protection announced the “Green Yards” program for auto salvage yards. The pilot program helps automotive recyclers understand and comply with environmental regulations and encourages voluntary compliance without enforcement risk. Property owners achieve the designation by demonstrating environmental compliance with more than 35 best management practices. As of 2007, 24 properties were officially recognized as “Green Yards” and more than 100 owners signed letters of intent for the program. The program supports the implementation of best management practices that help owners of salvage yards achieve environmental compliance and decrease the threat of contamination on their properties.

other refrigerants; mercury from switches; lead from lead acid batteries and wheel weights; and asbestos from brakes. Many states such as California, Colorado, Florida and Vermont identify best management practices and develop guidance to ensure that facilities are in compliance with environmental regulations.

In addition to compliance concerns at these facilities, challenges arise when operations close. Former salvage yards can become eyesores in the communities they once served. These properties may have significant levels of contamination. Given the size of the properties or the extent of potential contamination, the costs associated with cleaning up these properties may be significant.

## COMMUNITIES MEETING THE CHALLENGE

Although former salvage yards may pose concern to communities due to potential contamination and blight, the cleanup and redevelopment of these properties can help revitalize areas that were once considered eyesores to the community as shown in Onalaska, Wisconsin and Minneapolis, Minnesota.

### Keys to Success

- Interagency cooperation and partnerships facilitate the timely cleanup and redevelopment of two former salvage yards

Closure letters and Prospective Purchaser Agreements provide liability assurances to assuage developer liability concerns



## National Auto Wrecking Company

In Onalaska, Wisconsin, the National Auto Wrecking Company operated from 1952 to 1994 burning and crushing vehicles, salvaging car batteries, cutting transformers, and cutting up petroleum tanks. The 2.5 acre property was contaminated with PCBs, lead, motor oil, transmission fluids, antifreeze and other hazardous contaminants associated with the salvaging of vehicles.

After being approached by the Wisconsin Department of Natural Resources (WI DNR) about contamination concerns in 2000, the former owner and operator agreed to spend \$170,000 to determine the scope of soil contamination. The results revealed PCB and lead soil contamination. After the bankruptcy of the owner's estate, WI DNR and the EPA Region 5 Superfund Program formed a partnership and worked together to determine the cleanup remedy and implementation. The WI DNR spent an additional \$30,600 on property contamination investigations. Over the course of the project, approximately 11,000 tons of contaminated soil, more than 400 tons of debris, and 16 55 gallon drums of waste oils were



New business in the light industrial park

reused, recycled or chemically treated and properly disposed. Using approximately \$800,000 in federal funding, cleanup was complete in May 2004. Then the property was purchased by a developer who received a "closure letter" to signal the end of cleanup and protect the developer and any future owners from environmental liability. As a result of EPA's and WI DNR's partnership, three new light industrial businesses—including heating and cooling, windows and siding, and flooring businesses—now occupy the property.



Abandoned building, Anderson, IN



Former GM plant, Baltimore, MD



National Auto Wrecking Co. property

## Former Doc's Auto Salvage

Through innovative interagency cooperation and partnerships, Hennepin County, the Minnesota Pollution Control Agency (MPCA), the Metropolitan Council and EPA facilitated the reuse of a long idle brownfield located within a federally designated urban Empowerment Zone in Minneapolis, Minnesota. The Former Doc's Auto Salvage property historically was occupied by a drum-reconditioning facility, a service station and a scrap yard. From the mid 1970s until the early 1990s, the scrap yard was cited on numerous occasions for unlawful disposal of hazardous waste and illegal discharges of contaminated stormwater. In 1995, the business closed and the 1.1 acre property forfeited to Hennepin County. Due to pervasive contamination, the property was added to the Minnesota State Superfund List in 1997.

Given its small size, known contamination and location in a blighted neighborhood, the property remained vacant for several years. To expedite cleanup and redevelopment, Hennepin County and the MPCA developed a unique Joint Powers Agreement (JPA), which allowed the two agencies to combine resources to clean up the property. At the MPCA's request, EPA completed a removal action, resulting in the expedited treatment and disposal of 3,670 tons of lead contaminated hazardous

soil. Hennepin County, with the assistance of its consultant and the MPCA, completed an extensive site assessment, directed and contracted for building demolition, and arranged for the removal and disposal of drums, solid waste, and approximately 2,600 tons of contaminated soil within the redevelopment timeframe. Hennepin County enrolled the property in the MPCA's Voluntary Investigation and Cleanup Program to obtain liability assurances for the Metropolitan Council, the future owner. After securing a Prospective Purchaser Agreement from EPA, the Metropolitan Council purchased the property and constructed a \$3 million transit control center, which opened in 2002 and employs 30 people.

Old and abandoned automobiles end up in salvage yard



## *Addressing the challenges of USTs with innovative concepts*

### BACKGROUND

As ubiquitous as the car is to American society, so is the neighborhood gas station. At one time, a gas station was always just down the street or around the corner. Today, many gas stations are closed, vacant or simply underutilized, and many of those are left with petroleum contamination and underground storage tanks buried beneath. In some areas of the country, transportation corridors exist with numerous Underground Storage Tank sites at gas stations and other industrial facilities. Some are vacant, some abandoned, and some still in operation, but with leaking underground storage tanks buried just below the surface.

EPA estimates that there are approximately 640,000 underground storage tanks nationwide that store petroleum or hazardous substances, and the Agency defines an UST as: “a tank and any underground piping connected to the tank that has at least 10 percent of its

combined volume underground.” The dangers of USTs include the corrosion and leaking of bare steel tanks, which can lead to the contamination of soil and ground water with petroleum fuel, fuel additives or other hazardous substances.

### EPA MEETS THE CHALLENGE

As discussed earlier in this report, EPA is addressing challenges of leaking USTs under several programs, including RCRA, Superfund and Brownfields. EPA launched the USTfields Initiative in 2001 to promote revitalization efforts at sites with leaking USTs and gas stations across the country. When Congress passed the Brownfields Law and amended Superfund in 2002, 25 percent of Brownfields grant monies were allocated specifically for assessment and cleanup of brownfields contaminated with petroleum and petroleum products.

Digging up an UST outside a muffler shop along Route 66



## Site Inventories — Counting the Opportunities

Taking inventory of UST sites and contaminated properties is a useful tool for stakeholders to identify priority properties and bring limited resources to bear. Site inventories help encourage private investment, foster redevelopment planning, target cleanup and reuse efforts, and prioritize sites based on the extent of environmental contamination.

Using publically available resources—a variety of maps, fire department files, records of UST permits, state and county databases—inventories can be made into simple spreadsheets or elaborate geographic information systems. Some inventories are for city officials only, while still others are available to the public.

In the State of Washington, the Tacoma-Pierce County Health Department inventoried more than 740 former gas station sites in Pierce County through its Abandoned Commercial Tank Project.

In 2004, the Los Angeles Department of Environmental Affairs took a brownfields inventory which included approximately 50 properties in the 466 square mile city. The inventory started out as an electronic spreadsheet used to track former gasoline station properties, and through an EPA Brownfields Assessment grant, was expanded to include other types of sites. It was updated from an electronic spreadsheet to a technically advanced and user friendly Web-based database. The City of West Sacramento inventoried over 500 parcels to create a system that interfaces with the city's GIS database. The inventory is publically available and gives potential developers access to assessment information and helps city officials advance their redevelopment objectives.

## IMPACT OF USTS ON COMMUNITIES

Although petroleum contamination and USTs present potential hazards to communities, they also present opportunities. Gas station properties are usually located in high traffic areas that offer redevelopment potential. Unfortunately, these properties can suffer in developers eyes due to real or perceived contamination. Environmental assessment, cleanup and subsequent redevelopment can help reverse the blight in these areas. The USTfields Initiative demonstrates that communities benefit economically from redeveloped UST sites, especially those that are part of a larger revitalization effort. Additionally, USTs and gas station properties that are clustered in a community can be inventoried (see textbox) inventories can then help stakeholders prioritize sites resources.



Workers unearth large underground storage tanks



Gas station along Rt. 66 corridor

## Route 66 Initiatives

In the southwest, a collaborative effort between EPA Region 9 and the Arizona Department of Environmental Quality (ADEQ) is exploring opportunities and barriers to redevelopment along the State of Arizona's section of the famed Route 66 corridor.

Serving as the first cross country highway connecting Los Angeles and Chicago, Route 66 was a main artery roadway for over 40 years. After 1970, four lane highways bypassed many parts of the road and it became the road less taken. In its heyday, hundreds of gas stations sprung up to support the thriving roadway. And while they still dot the landscape, many of these fueling stations leaked petroleum into the soil and ground water. In Arizona alone, it is estimated that 350 sites with leaking USTs or piping are located along the state's 200 miles of the original route. ADEQ created the Route 66 Initiative to address those sites. Approximately 75 percent of the Arizona sites are closed, with corrective action completed or unnecessary. The remaining 25 percent await further investigation or cleanup.



Abandoned outbuilding along Route 66

In 2004, ADEQ began working with affected communities along the route—such as Winslow, Holbrook, and Joseph City—because of a large number of UST releases affecting the ground water in these cities. The following year, ADEQ partnered with more communities and since January 2006, is looking at the full spectrum of sites along the roadway through the Route 66 Initiative. The goals of the program are to remove USTs through the state's Municipal Tank Closure Program (MTCP), identify and clean up UST releases or spills, and work with owners, operators or any volunteers regarding releases.

## Historic Highways Project

The Historic Highways Project picks up the inventory and assessment of abandoned gas stations along Route 66 in the states of Missouri and Kansas, as well as the former Lincoln Highway in Iowa and Nebraska. In August 2007, the Historic Highways Project got started when a team of federal and state agencies identified and developed an inventory of 217 gas stations in 115 different communities along the Route 66 highway. Led by the EPA Region 7 Land Revitalization Team, the project team members include: EPA Brownfields and Underground Tanks Programs, the National Park Service, the Missouri Department of Natural Resources, the Kansas Department of Health and Environment, the Iowa Department of Natural Resources, and the Nebraska Department of Environmental Quality.

The overall goals of this project are to assist communities and owners of gas stations along the route in identifying and addressing any barriers to using these sites in a sustainable manner. Since the original group of sites was identified, the project has concentrated on properties that have the best chance of redevelopment and reuse. The types of assistance available includes reuse planning, site assessments, legal advice, historical restoration grants, environmental assessment and cleanup grants, and technical assistance on environmental investigation and cleanup.

## Prineville, Oregon Gas Station— A Part of the Whole

UST sites and former gas stations can sometimes play a role in a larger redevelopment project. While these properties are typically smaller in size—but are situated in prime locations (e.g., busy street corners, downtown areas)—they can be combined with large scale redevelopment efforts and make more of an impact. For example, in the small town of Prineville, Oregon, the site of a former gas station with soil and ground water contamination was part of an effort to revitalize downtown after a decade of population growth.

To accommodate the growth, the city began revitalizing a portion of its downtown area, some of which was damaged by a flood in 1989. A comprehensive revitalization project included redeveloping damaged properties, constructing a



During construction on the new City-County Government Services complex on the same corner



Before image of Prineville gas station on busy street corner

new City-County Government Services Complex and family resource center, creating new parks and open space, and extending the road. As part of that larger effort, the 0.25 acre former gas station property was redeveloped to be a new City Hall and Community Plaza. The property, which was located in the flood plain area, was found to have leaking USTs and gasoline vapors migrating to nearby buildings contaminating air quality.

In 2004, a \$200,000 Brownfields Cleanup grant was used to address soil and ground water petroleum contamination and minimize vapor migration. More than 2,700 tons of petroleum impacted soil were excavated; onsite treatment of contaminated ground water was conducted; and onsite buildings were demolished. After the cleanup and redevelopment were completed, the City Hall and Community Plaza hosts visitors for concerts, speeches and community events.

Former service station sits idle along the roadway





# Going Forward

Idled and blighted former automotive properties can have significant negative environmental and economic impacts on communities. Municipalities have successfully addressed these properties by partnering with EPA, auto manufacturers, states and other interested parties. Collaboration, planning and information exchange are key methods for moving forward.

The information presented in this report identifies successful strategies and partnerships that can assist municipalities in planning for upcoming automotive plant closures and consolidations. This planning can help facilitate the return of former auto sector properties to productive reuse.

The following insights and strategies were gathered from local governments that successfully met the challenges of cleanup and redevelopment at former auto related properties.

**Keep long term sustainability in mind** during planning, cleanup, and redevelopment. Using sustainable cleanup and redevelopment practices throughout the entire life cycle of a project can result in long term environmental, economic and social benefits. Since many auto related properties are centrally located in urban areas where infrastructure already exists, developers have an opportunity to use existing infrastructure and help preserve greenspace by reusing these properties. When readying a property for redevelopment, using construction and demolition materials recycling strategies diverts waste from landfills, reduces the amount of raw materials needed for new products, and may provide economic benefits. This was the case in the Baltimore GM project where recycling 96 percent of all non hazardous building materials offset the total cost of building demolition. Incorporating green building design techniques into projects such as energy and water efficiency strategies; using reused, recycled and regional materials; and stormwater management best practices can provide environmental as well as economic benefits through reduced energy usage and reduction in long term expenditures.

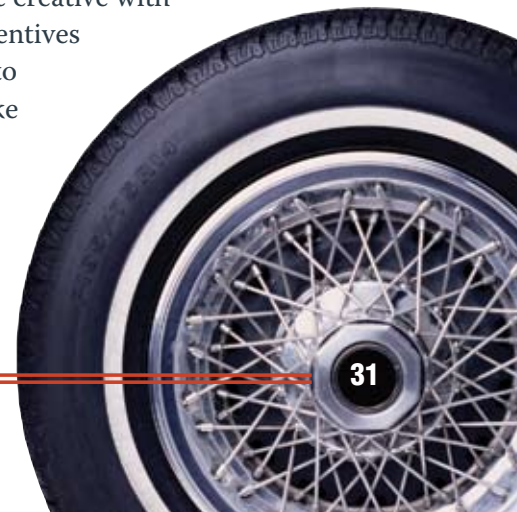


Native landscaping at the new retail center, Allen Park, MI

**Work with the auto manufacturers** in the region to address properties that are already closed or idle, and proactively plan for any future closures. This enables the community to provide input to the reuse plan as well as provides the manufacturers with an understanding of the community goals for a property. For example, in Anderson, Indiana, the collaborative relationship struck between the city and General Motors, allowed for the transfer of 300 acres to the city. The city is redeveloping the area, making a positive difference in its future.

It is important for communities to incorporate sufficient time for public outreach when developing project timelines. For example, the City of Kenosha, Wisconsin held two citywide forums to discuss the community's ideas for reuse and then partnered with Chrysler and ULI to develop a plan that reflected the community's vision. As a result, a majority of the community supported the redevelopment effort and understood the length of time needed for the project.

Communities can be creative with financial and other incentives when working with auto manufacturers. To make the project financially enticing, Allen Park, Michigan used tax increment financing to



reimburse some of the auto company's redevelopment costs. Anderson, Indiana used profit sharing with the developers based on the number of local jobs created.

**Identify opportunities to streamline regulatory and administrative processes** wherever possible. Because these properties are often large, contain widespread contamination, and can cross county lines, they are usually under the jurisdiction of multiple regulatory agencies and localities. Working with the local, state and federal government to develop streamlined planning, administrative, permitting, and regulatory approaches and processes can help save time and money—two factors that may ultimately determine whether a developer proceeds with a project. In the Baltimore GM project, the collaboration among EPA Region 3's RCRA Program, MDE and the developer helped streamline the RCRA and VCP requirements to meet an 18 month cleanup deadline.

midstream. For example, the Ford Rouge plant was originally designed to be a self-sustaining automobile operation and had power, glass, cement and byproduct facilities onsite—and as a result contained a wide array of contaminants. Whether the property is small or large, thorough site assessment and characterization of contaminants are instrumental to identifying the cleanup activities needed to realize the property's full potential. Garnering a full understanding of the properties' challenges up front will facilitate future reuse opportunities.

**In conclusion,** underutilized or idled properties created by economic conditions that resulted in the consolidation of the U.S. automotive industry create distinct challenges for municipalities. Many local governments are turning these challenges into opportunities for community revitalization and planning for the future as the automotive industry



Riverfront Park, Fitchburg, MA



Truck plant at Ford Rouge, Dearborn, MI



Demolition at Gates Rubber Plant, Denver, CO

Creating an implementation strategy during the initial phases of the project that outlines timelines, roles and responsibilities, and estimated costs can be instrumental in managing the project tasks, reassessing the process as issues arise, mitigating schedule lags, and assisting in decision making.

**Characterize the property through** in depth and extensive site assessments. Many automobile facilities and salvage yards operated for years and as a result can have significant and varied contamination. Thorough characterization helps mitigate unexpected future contamination findings which could halt the project

continues to transition. It is also important to note that applying the strategies and lessons learned presented in this report at one property can help establish strong partnerships for future redevelopment projects, create a coalition of knowledgeable and informed stakeholders, and streamline and facilitate community wide revitalization through a better understanding of applicable local, state and federal cleanup and redevelopment regulations. For more information on how EPA can help with a former auto sector property, please visit EPA program office Web sites.<sup>7</sup>

## Paving the Way to Success: Tools of the Trade

In addition to the more auto specific strategies previously outlined, municipalities may want to consider incorporating the following general principles and tools in their redevelopment plans.

**Build collaborative partnerships** to pool financial and other resources; establish multidisciplinary teams to creatively address a project's challenges; and when possible, incorporate smaller redevelopment projects into area wide redevelopment efforts.

**Encourage community involvement** from the initial planning stages through a project's completion; this can pave the way for a conflict free and community supported endeavor. Involvement can range from quarterly public meetings to more in depth design charrettes and visioning sessions to determine a property's reuse.

**Identify a local champion** or dedicated project advocate to coordinate among stakeholder groups and ensure that consensus is achieved throughout each phase of the project, stakeholder interests are recognized and understood by everyone in the process, and project obstacles or issues are quickly addressed.

**Address and manage liability concerns** by understanding the applicable state and federal regulations and liability protections early in the process. Whenever possible, work with state voluntary cleanup programs to help navigate the cleanup. In addition, municipalities should work with EPA and their state VCP to establish additional assurances such as closure letters and Prospective Purchaser Agreements to outline what activities must be finished before cleanup is considered complete and the property is "ready for reuse."

**Plan for success** and determine the specific end use of a property as early as possible in the process. Better designed, more cost effective, faster, and more marketable cleanup and redevelopment projects can be achieved through up front end use determination.

## ENDNOTES

<sup>1</sup> For the purposes of this report, "automobile manufacturing" includes data from NAICS codes 3361, 3362, and 3363. These sectors include not only automobiles but also light duty trucks and utility vehicles (336112), heavy duty trucks (33612), truck trailers (336212), motor homes (336213), and campers (336214).

<sup>2</sup> U.S. Census Bureau. U.S. Census Statistical Abstract for 1995. Retrieved November 2007, from [http://www.census.gov/prod/www/statistical-abstract-1995\\_2000.html](http://www.census.gov/prod/www/statistical-abstract-1995_2000.html)

<sup>3</sup> Office of Aerospace and Automotive Industries International Trade Administration, U.S. Department of Commerce. *The American Automotive Industry Supply Chain—In the Throes of a Rattling Revolution*. Retrieved December 2007, from <http://www.trade.gov/td/auto/domestic/SupplyChain.pdf>

<sup>4</sup> Office of Aerospace and Automotive Industries International Trade Administration, U.S. Department of Commerce. April 2006. *The Road Ahead for the U.S. Auto Industry*. Retrieved December 2007, from <http://www.ita.doc.gov/td/auto/domestic/roadahead06.pdf>

<sup>5</sup> Office of Aerospace and Automotive Industries International Trade Administration, U.S. Department of Commerce. April 2006. *The Road Ahead for the U.S. Auto Industry*. Retrieved December 2007, from <http://www.ita.doc.gov/td/auto/domestic/roadahead06.pdf>

<sup>6</sup> U.S. Census Bureau. Economic Census for years 1997 and 2002. Retrieved November 2007, from <http://www.census.gov/epcd/www/econ97.html>

<sup>7</sup> Brownfields: <http://www.epa.gov/brownfields/>  
RCRA: <http://www.epa.gov/rcraonline/>  
Superfund: <http://www.epa.gov/superfund/index.htm>  
OUST: <http://www.epa.gov/OUST/>

