

Clean Air / Brownfields Report



*The U.S. Conference of Mayors
December 2001*

*The United States
Conference of Mayors*

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Executive Summary

The Clean Air/Brownfields Pilot Project was initiated by The U.S. Conference of Mayors, the Economic Development Administration of the U.S. Department of Commerce and the U.S. Environmental Protection Agency to examine the potential for clean air policies to impact brownfields redevelopment goals. Mayors have been at the forefront of the effort to return brownfields properties to productive activities and have cited Clean Air Act requirements as a potential impediment to the reuse of these sites.

Across America, there is consensus that brownfields redevelopment is critical to reviving and expanding local economies. Local elected officials, particularly, see tremendous opportunity to increase employment, strengthen the local tax base, and improve blighted neighborhoods through the reuse of these sites. As a result, mayors are concerned about state and federal policies that may impact efforts to redevelop brownfields.

With the adoption of new air quality standards in 1997, a number of mayors

questioned whether federal air quality standards and related policies implemented by states would impede local governments' ability to redevelop brownfield sites. There is a belief that current air quality policies and brownfields redevelopment goals might conflict or compete with each other. Mayors are specifically concerned that their options for redeveloping brownfields could be limited if traditional approaches to clean air attainment are continued.

The participants in this Pilot Project reviewed these challenges for two years. The findings of their deliberations are summarized below. It should be noted that this paper serves not as a scientific research paper but as a compilation of comments, discussion, and interviews with a variety of interested stakeholders. Our conclusions are based in part by the research conducted as well as by the discussion sessions that were held throughout the course of the two-year project.

General Findings of the Pilot Project:

◇ ***The Pilot cities, like many urban areas, share many common attributes, in terms of air quality and brownfields redevelopment goals. They also tend to employ a variety of approaches to accomplish both sets of goals.***

- The Pilot cities have in common two major attributes relevant to this discussion. First, they are implementing aggressive brownfields redevelopment strategies that are beginning to demonstrate some success. Their emerging success and its continuation depends on support from other social and environmental policies. Second, each of the Pilot cities was designated as a nonattainment area for one or more National Ambient Air Quality Standards, and none has yet attained compliance with applicable air quality standards.

- The Pilot cities employ different approaches to brownfields and economic redevelopment goals. For example, while some seek to include industrial land use activities in their brownfields redevelopment mix, others would rather emphasize commercial or residential land use activities. The cities also differ in terms of how involved they are with the industrial air permit process. Some do not get involved with these permits because the state performs that function; others take a passive role in air permits.
 - The Pilot cities generally agreed that most local governments do not specifically consider air quality regulations when developing and implementing brownfields redevelopment strategies. They agreed that brownfields projects generally cost more to redevelop than a greenfield site because of clean-up requirements. When a brownfield site, targeted for redevelopment, coincides with air quality nonattainment areas, the added costs associated with industrial pollution control technology places an additional layer of cost to this class of land use redevelopment. Yet, the exact nature of the interplay between brownfields redevelopment and air quality requirements remains elusive and not well understood.
- ◊ ***Environmental regulations, including air quality policies, have not traditionally been a determining factor for industry in making location decisions. The issuance of more stringent standards, however, has triggered concern among certain industries. Some businesses have expressed concern that permit requirements are gaining stature as a critical factor in location decisions.***
 - The literature revealed that environmental policies (e.g., air quality, water quality, solid waste goals), are not as important as traditional location factors such as availability and cost of land, distance to raw materials, availability of infrastructure, and state and local taxes, to name a few.
 - Going beyond the literature and consulting with a small sector of the business community offers a different perspective. Interviews with five companies, representing different sectors of industry, agreed on a number of issues. The interviewees indicated that manufacturing businesses regulated as “stationary sources” routinely consider the extent of air regulation requirements when making location choices for new or modified physical plants. These requirements affect key concerns such as plant design and cost and permit approval times necessary to satisfy the regulations. There is some indication that these considerations grow in importance when potential sites for expansion or new facilities are located in nonattainment areas.
 - Each of the five business interviewees indicated that they factor in air quality requirements differently. Some companies devise normative analyses procedures, such as using check-lists, weighting schemes, etc.; some find nonattainment status as a threshold for acceptable size of plant based on pollution control economics; and some find that the nonattainment status for some sites is an impediment that precludes expansion or siting of physical plants.
 - ◊ ***Local governments have little experience in factoring air quality goals into brownfields redevelopment strategies. The potential for emerging regulations to impact brownfields redevelopment efforts is currently subject to great uncertainty. It is advisable to continue monitoring how these regulations might impact redevelopment strategies.***

- Despite the sophisticated treatment of air quality goals by some major U.S. cities, generally speaking, local governments do not specifically consider air quality regulations when developing and implementing brownfields redevelopment strategies. The exact nature of the interplay between brownfields and air quality requirements remains elusive and is not well understood.
 - The Pilot cities felt that the process of multi-jurisdictional discussions between local, state, and federal agencies that are responsible for economic development and public health concerns was invaluable. By involving all of these groups, the Pilot cities agreed that there was a better understanding of the missions and goals of each of the groups and that coordinated and more efficient work efforts were made as a result.
 - The local government participants generally agreed that brownfield projects cost more to redevelop than a greenfield site. They cited clean-up requirements as well as the added costs associated with industrial pollution control technology on “stationary sources” as an additional layer of burden in siting on a brownfield.
 - Case studies comparing infill (brownfields) and greenfield development projects recognized the indirect air quality benefits of brownfield projects, largely due to a reduction of vehicle miles traveled (VMT). Since vehicular emissions contribute one-third to one-half of many communities’ air pollution, the pilot communities felt strongly that brownfield redevelopment and other infill projects should be encouraged and communities should be rewarded for their efforts in this regard.
 - A brownfield redevelopment case study was discussed, where the site incorporated cleaner, energy-producing technology. This project provides some indication that, under certain circumstances, brownfields can be redeveloped and air quality can be improved simultaneously. Indeed, some of the approaches taken by the Pilot cities are unique and innovative, and may serve as “best practices” that can be used by other cities.
 - Another brownfield redevelopment project demonstrated how resolving air quality requirements is critical to a successful outcome. In this example, failure was avoided due to the ability of the city to obtain one-time offsets through the donation of air credits from another company.
- ◇ ***The Pilot city participants generally agreed that more information and further dialogue and research, concerning air quality impacts on economic and brownfields redevelopment, was desirable.***
- Pilot city participants felt that local governments have a compelling interest in further clarifying the potential for air quality and redevelopment goals to yield conflicting results that may not be in the best interest of their residents, businesses and institutions. There are two major reasons why this is important.
- First, some of the industries that were interviewed described how stringent air quality regulations often require costly industrial pollution controls. These controls result in the business community’s reliance on “grandfathered” permits in order to avoid the re-opening of their permits. Thus, the lack of progress in technology modernization leads to a continuation of the potential for poor air quality to adversely impact public health.
- Second, cities must attract a mix of land use activities to achieve redevelopment that incorporates an adequate tax base and employment growth, as well as a

local/metropolitan multiplier effect, in order to provide public services, and to finance the redevelopment and modernization of decaying urban infrastructure. Local governments should take advantage of the dual benefits that derive from locating less polluting new technology in urban centers in order to generate a tax base that furthers their efforts to improve both air quality and the local economy.

- Since the potential connection between economic development and improved air quality remains elusive and not well understood, pilot city participants agreed that additional research is needed to further determine if connections can be found.

Examples of additional research could include examining the applications submitted under New Source Review (NSR). EPA estimates that they receive between two to three hundred major NSR applications, but that states receive thousands of minor source applications. It would be useful to examine where these minor and major source applicants are located and see if there is any data indicating that certain minor sources were located just beyond the boundaries of non-attainment areas that would have been major sources if located within the non-

attainment area. This may possibly lead to further follow-up to determine if those businesses took into account an area's attainment status prior to making a location decision. It may be helpful to review these applications over the last five years in terms of their current (or final) disposition.

- ***The Pilot city participants identified areas where EPA and other federal agencies can help local governments achieve clean air and redevelopment goals. These areas include action items that EPA and other federal agencies, states, and local governments can pursue, as well as areas that warrant further research and intergovernmental dialogue to determine how to balance these sometimes-conflicting goals.***

- Local governments have a vested interest in further examining ways to improve clean air quality while maintaining economic development activities. A national dialogue is needed to explore innovative and alternative ways to improve air quality.

- The Pilot cities agreed that a multi-jurisdictional and regional approach is likely to be the best method to develop comprehensive solutions that would address a communities' economic and air

quality needs. The Pilot cities felt that support would be needed to bring the appropriate agencies together to develop a comprehensive plan for a region that would take into account economic development, air quality, and transportation needs.

- Various local government initiatives were identified by the Pilot cities that are likely to have air quality benefits. These initiatives include encouraging mixed use or high density zoning, converting fleets to cleaner burning fuels, and creating design elements that encourage alternative transportation methods. Further research is needed to quantify the potential air quality benefits of these initiatives. Additionally, "Best Practices" that promote cleaner air and economic development need to be identified and promoted throughout the country.

- The Pilot cities agreed that for cities that are seeking to attract new industry, the ability of a city to offer emission offsets to modern, efficient technology can act as a potential incentive to locate on brownfields and other infill sites. Some of the participants suggested that emission trading and banking programs could provide valuable redevelopment assistance if cities had a greater ability to direct and target the trading process.

Additional research into emission reduction programs, including voluntary local measures, and local banking programs would be useful. Examples of what cities might do to create the avoided emissions include: infill versus greenfield development, investment in transit-oriented development, and imposition of local ordinances such as eliminating overnight engine running, and clean-fuel fleet programs.

The flexibility necessary to develop trading and banking programs requires an intergovernmental agreement. Currently,

States usually control these programs. The pilot cities recommended that local governments should be able to use all or a portion of the avoided emissions as off-sets for new and expanded redevelopment in brownfield areas. An example of this type of flexibility is being demonstrated with a new EPA pilot program, Project XL, in the Chicago metropolitan region that will allow businesses locating in specifically designated development zones to be given alternative methods of complying with the offset requirement.

- The Pilot cities felt that it would be advantageous for local air quality and public health reasons to favor energy efficient sources over older technologies that are more polluting. It was suggested that setting aside some portion of the NOx budget for modern, efficient combustion units could provide some flexibility for business development in urban nonattainment areas.

Introduction

Background and History of The U.S. Conference of Mayors and Brownfields Redevelopment

The U.S. Conference of Mayors has taken a strong leadership role in promoting the redevelopment of brownfields throughout the United States. The Conference of Mayors defines a brownfield as an abandoned or underutilized piece of property where development is impeded by either real or perceived environmental contamination. The General Accounting Office estimates there are approximately 400,000 to 600,000 brownfield properties in the United States, including old industrial tracts, abandoned gas stations, vacant warehouses, and even residential properties. Many of these sites – once thriving areas – are now eyesores contributing to the decline of city neighborhoods.

Redeveloping brownfields has been a priority for the nation's Mayors for several reasons. A study released by the Conference of Mayors entitled, "*Recycling America's*

Land: A National Report on Brownfields Redevelopment, Volume III, 2000," identified four important benefits associated with brownfields redevelopment. The four benefits include: increasing city tax bases; creating new employment; revitalizing neighborhoods; and, protecting the environment. The study estimated, for 177 large population cities, that the lost annual tax revenues from underutilized urban brownfields ranged from \$902 million to \$2.4 billion. The study also estimated that redeveloping these sites could create an additional 580,000 jobs. The potential for increased tax base, new employment and other positive multiplier effects is important to local governments who need additional resources to rejuvenate their cities and improve environmental quality.

There is another important benefit from putting brownfields back into productive use. The process of redeveloping brownfields almost always involves modernizing connecting infrastructure facilities such as roads, sewers, and water distribution lines, thereby improving the overall quality and desirability of the urban centers in which they are contained. This, in turn, relieves the

pressure for suburban and exurban development, preserving farmland and open spaces.

The Conference of Mayors has worked, since 1993, with the Executive Branch and Congress to encourage the creation of programs and policies that will assist local governments and businesses in their efforts to redevelop brownfields. Critical factors for brownfields redevelopment as described in the Conference of Mayors' Brownfields Redevelopment Expanded Action Agenda include:

- allocating sufficient resources to conduct environmental assessments and cleanup;
- providing tax incentives for businesses who want to develop or locate on brownfield properties;
- changing liability laws to protect innocent purchasers and developers; and
- establishing guidelines for "finality", also called "closure", for owners who go ahead and clean up their properties to acceptable standards.

Current Federal Air Quality Standards and Brownfields Redevelopment

In its Action Agenda, the Mayors call for federal agencies to review their policies and regulations to find out if these policies have unintended consequences that might have a negative impact on brownfields redevelopment or green space preservation. According to the Action Agenda, “all federal agencies need to examine their policies and programs to determine if their policies promote or impede brownfields redevelopment, cause the creation of additional brownfield sites, or promote the development of green spaces.” The Conference of Mayors believes that federal policies should be consistent in their goals to redevelop brownfields and preserve green space. Where the various policies are inconsistent and potentially conflicting, Mayors recommend that the federal government adjust them in ways that will help local governments redevelop brownfields, and thus realize the environmental, social and economic benefits identified above.

In this regard, the Mayors were particularly concerned about the 1997 changes in the Clean Air Act National Ambient Air Quality Standards (NAAQS). These changes raise

the bar for ozone compliance by extending the one-hour standard to eight hours, as well as increase the standards for particulate matter (PM) by 400 percent (from 10 microns to 2.5 microns). Many mayors feared these changes will push their cities into the “non-attainment” category for ozone and PM standards, making it only harder for them to attract and retain business and employment critical for urban revitalization.

The Mayors also question the effectiveness of EPA’s approach to improving air quality, given their belief that the new standards focus primarily on stationary pollution sources. Many mayors now recognize mobile sources to be the largest growing source of air pollution in their communities.

At the core of the Mayors concerns is that more stringent air regulations, along with the time and costs associated with obtaining permits in non-attainment areas, will drive businesses to regions designated as “in attainment”. A case in point involves a Chicago-based company, which wanted to expand its current production capacity on a neighboring brownfield, but could only do so by increasing its emissions. This meant the company had to apply for an air permit and obtain offsets from other companies because it was located in a non-attainment area. When

it encountered difficulty in acquiring sufficient offsets, the company considered shutting down or relocating to another part of the country where they would not face similar obstacles. Fortunately, the City of Chicago had just created an air bank following a donation of 300 tons of “retired” air credits from 3M. As a result, the city was able to grant the company the necessary credits for expansion. There was a happy ending to this story: the company remained in the city, expanded its facilities on a former brownfield site, and created new jobs for the area.

Not all cities, however, have access to air credits that they can convey to companies that want to expand or locate in their city. This poses an interesting policy question that the Mayors wanted to explore. Do EPA’s new air quality standards actually effect business’s decision to expand and locate away from already established urban areas into more pristine greenfields, thus, potentially having a net negative impact on the environment? Many mayors wanted to determine if this was the case. They believe that the new rules are creating a competitive disadvantage for non-attainment cities by giving incentives to businesses to expand and locate in attainment areas. If this is the case, they argue, the rules are encouraging sprawl, and all of the problems associated with sprawl

including increases in vehicular emissions. Following this logic to its conclusion, are we then denigrating air quality in the attainment areas, perhaps even causing harmful spillover effects on the non-attainment areas?

Former Fort Wayne Mayor and Conference of Mayors President Paul Helmke made just this case at EPA's Brownfields '97 Conference. He said the new Clean Air Act standards might further impede local efforts to redevelop brownfields. He said there will be "serious environmental consequences of sprawl, including the air impact of continuing to grow in ways that increase, not lessen, automobile dependency and raise vehicle miles traveled."

To make more sense of this complex issue, the Economic Development Administration (EDA) of the Department of Commerce and the Environmental Protection Agency (EPA) entered into a cooperative research project with The U.S. Conference of Mayors. The purpose of the research project was to determine what is the linkage between clean air regulations and economic development, particularly when it takes the form of brownfields redevelopment. Specifically, how do federal and state air quality policies impact local government's ability to balance clean air and economic development goals?

This Report

This report summarizes the findings of the EDA/EPA/Conference of Mayors research project, which focused on two areas of investigation. The first area of investigation concerned the relationship between air regulations and business decisions involving location, upgrading, and expanding manufacturing facilities. Specifically, do businesses consider air quality regulations in their business location decision-making? If so, how important are they relative to other location decision-making factors such as taxes, the availability of a well-educated workforce, and access to good transportation services.

The second key area of investigation concerned whether air regulations play a role in the design of brownfields redevelopment projects. For this part of our study, we reviewed some actual projects. Here, we were interested in finding out if brownfields redevelopment can yield air quality improvements.

To implement the research done, three pilot cities were selected for in-depth research: Baltimore, Chicago, and Dallas. These three cities were picked because they have sophisticated brownfields redevelopment

programs (e.g., they are all Brownfields Showcase Communities); they were all experiencing air quality problems pertaining to the National Ambient Air Quality Standards (NAAQS); and they represent a geographically and economically diverse group of cities.

It should be noted that at times throughout the report, there is not always a distinction made between brownfields redevelopment and other forms of economic development. The reason for this lack of distinction is due to the fact that the definition of a brownfield site is a "property that is abandoned or underutilized whose redevelopment is hindered by either real or perceived environmental contamination." It has been the experience of most cities that almost every underutilized property within a city fits that description. Since most cities define their properties in this way, we have not made a distinction between the two in our examination.

The report is separated into four chapters.

Chapter One of this report provides background information on each of the pilot cities including their economic development and population histories, the status of brownfield sites within their communities, and

each city's air quality status as it relates to NAAQS.

Chapter Two summarizes what we currently know about how clean air regulations affect business location and expansion decisions. In our analysis, we draw upon the literature on industrial location decision-making, a survey of manufacturing businesses in our three pilot regions, and information gathered through a series of

industry interviews with major national companies.

Chapter Three describes the strategies for redeveloping brownfield properties in each of our three pilot cities. Included are case studies of brownfield redevelopment projects that appear to have the potential for decreasing air emissions over time. Where available we have included data from a new EPA report that computes the transportation

and air quality impacts associated with undertaking development at a brownfields versus a greenfields site within the same region.

Chapter Four includes emerging findings on the relationship between clean air policy and urban redevelopment, and recommends some possible next steps for simultaneously promoting clean air and economic development.

Chapter 1

Overview of Pilot Cities:

Baltimore, Chicago and Dallas

This chapter describes some of the key characteristics of the three pilot cities, including: recent trends in population and employment; the status of brownfields redevelopment efforts; and current ambient air quality designations.

These three cities were selected for the study because they have significant brownfields acreage, have aggressive brownfields redevelopment programs, and have been designated as nonattainment for one or more national ambient air quality standards. The three cities are among the 20 largest population centers in the country.

Baltimore

Population Changes:

Baltimore has experienced dramatic population decline, dropping from 949,708 in 1950 to 692,800 in 1995. Part of the population decline is explained by industrial activity moving to suburban locations.

Economic Characteristics:

Employment in the city has declined less dramatically, but has clearly shifted from a manufacturing base to one with a greater role for service industries (finance, insurance, real estate). The city has been engaged in an economic redevelopment effort for some time. This effort seeks to encourage a mix of land use activities, including older heavy industries alongside newer non-polluting industries. The Baltimore metropolitan economy accounts for more than one-half of the state's gross product.

Brownfields Characteristics:

Like many other urban centers, Baltimore has taken steps to address its brownfields problems. The City Planning Department estimates that there are approximately 1,000 acres of vacant, under-utilized industrial land in the city. More than 400 of them are in Baltimore's Empowerment Zone. The Empowerment Zone is the focus for the city's redevelopment efforts because there is a limited amount of space elsewhere in the city for expansion.

Air Quality Status:

The City of Baltimore is part of the regional airshed that includes all, or portions of, the counties of Baltimore, Anne Arundel, Carroll, Cecil, Harford and Howard. This airshed has had significant problems with carbon monoxide (CO) and ozone due to heavy emissions from stationary and mobile sources. Through hard work, the airshed has been successful in upgrading its CO designation to attainment (in 1995). The region remains a "severe nonattainment" area for ozone, however. In 1999, ambient monitors reported ground-level ozone concentrations exceeding the standard 11 times.

The State of Maryland has primary responsibility for achieving air quality goals in the City of Baltimore through the State Implementation Plan (SIP). The state is responsible for monitoring air quality in the airshed and is the designated stationary source permitting authority.

Chicago

Population Changes:

Chicago's population was 2.8 million in 1990. According to the Northern Illinois Planning Commission (NIPC), Chicago's population will be three million by 2020 – roughly the same as its 1970 population. The NIPC predicts Chicago will continue to increase in population as the northeastern Illinois region grows to more than nine million inhabitants over the next twenty years.

Economic Characteristics:

The Chicago metropolitan area currently has the third largest labor pool in the nation and accounts for more than 70 percent of the state's gross product. The city has been engaged in an aggressive economic redevelopment effort, a major component of which includes attracting new industry.

Brownfields Characteristics:

The city established the Chicago Brownfields Initiative (CBI) in 1993 as a response to urban sprawl. City officials recognize that developers are choosing suburban and rural development sites because of remediation concerns about various industrial zones in the city. The CBI is one way the city can acquire, assemble and cleanup properties to make them available for

commercial, residential and industrial re-use. The city is currently managing the cleanup and redevelopment of more than 25 sites. The redevelopment goal is to return the underutilized brownfield sites to productive use that will allow: 1) expansion sites for existing companies, 2) large land assemblages for industrial parks, and 3) smaller, single user developments.

Air Quality Status:

The City of Chicago is part of the regional airshed that includes all, or parts of, the counties of Cook, DuPage, Kane, Kendall, Lake, McHenry and Will. This airshed has been designated as "severe nonattainment" by the State of Illinois for nitrogen oxides (NOx) and ozone. The airshed is required to achieve compliance with the state's ozone standard by the year 2007.

The City of Chicago is an active member of the Greater Chicago Regional Dialogue on clean air issues. This group of local area officials is seeking regional approaches to improving air quality so as to continue to attract industry to the region and create more jobs. The group's current focus is on reducing volatile organic compounds (VOCs) and NOx emissions, the precursors of ozone, from mobile sources, since air pollution from mobile sources now exceeds that from stationary sources.

Dallas

Population Changes:

Unlike Baltimore and Chicago, Dallas has experienced population growth over the past 30 years. In 1970, Dallas's population was 844,401; in 1990, it was one million. While the city's population has grown overall, certain city neighborhoods have experienced population decline.

Economic Characteristics:

Since its beginnings as an agricultural trade center, Dallas has transformed itself into a modern diversified economy. Its current business mix includes finance, insurance, biotech research, light manufacturing and high-tech industries (telecommunications and electronics), in addition to traditional agricultural activities. The Dallas metro region is a key economic center within the state, accounting for more than 20 percent of the state's gross output.

Brownfields Characteristics:

Since the city established the Dallas Brownfields Program (DBP) in the early 1990s, it has worked aggressively to redevelop its brownfields. The DBP is an integral part of the City's Economic Development Department.

Currently, the focus of attention for redevelopment in Dallas is an 80-square mile area that includes three state-designated enterprise zones and a federally-designated empowerment zone. Working with the private sector development community, the city is putting together redevelopment projects, many of which are on brownfield sites. Industrial activity is not emphasized in the Dallas's redevelopment efforts. However, industrial land use activities are evaluated on an individual basis.

Land use decisions in these areas are guided by plans developed through the local tax increment financing districts (TIFs) and public improvement districts (PIDs). Each TIF and PID has its own board, including property owners, city and county representatives, and local school district members. These boards are intimately involved with brownfield site planning and revitalization.

Air Quality Status:

Sixteen-county North Central Texas is a metropolitan planning region centered around Dallas and Fort Worth. The region, which has a population of 5.1 million and an area of approximately 12,800 square miles is classified as a "severe nonattainment" region for ozone. In 2000, the regions exceeded ozone standards six times.

The Texas Natural Resource Conservation Commission (TNRCC) of the State of Texas has primary responsibility for achieving air quality goals in Dallas through the State Implementation Plan (SIP). The state is responsible for monitoring air quality in the airshed and is the designated stationary source permitting authority.

Comparing the Three Pilot Cities

The three pilot cities have a number of characteristics in common, and some unique distinctions:

Population Changes:

Over the past 30 years, Baltimore and Chicago have both experienced periods of population decline, followed by periods of slow but steady population regrowth. The long-term prognosis in both cases is for continued growth in population. The City of Dallas, on the other hand, has experienced population shifts, but not population declines.

Economic Characteristics:

The cities are all major contributors to their metropolitan and state economies. They are also important employment centers.

Air Quality Status:

All three cities have been designated as

nonattainment for one or more NAAQS.

Brownfields Redevelopment:

All three cities have established and implemented aggressive brownfields redevelopment initiatives. These redevelopment initiatives, however, may or may not include attracting new or expanded industry in the redevelopment mix. Baltimore and Dallas, for example, have expressed an interest in attracting industry, but only non-polluting industry.

Air Quality Goals:

The pilot cities have notable differences concerning air quality goals. Chicago is very much involved in the air permitting process for industry, while Baltimore has no direct involvement with the State of Maryland's permit program.

It is also worth noting that the Chicago and Dallas airsheds are surrounded by areas that are in attainment, whereas beyond Baltimore's airshed are the Washington, DC and Philadelphia airsheds, which are also not in attainment. Officials in Chicago and Dallas think that their particular situation pushes businesses to pass up their region for neighboring ones, since there they can save time and money not dealing with clean air problems. Whether this is an accurate perception is the subject of our next chapter.

Chapter 2

Examination of the Relationship Between Brownfields Redevelopment and Clean Air Policy

This Chapter examines whether or not there is evidence that clean air requirements impact redevelopment efforts in brownfield areas. Chapter One suggested that each of the Pilot Cities seek to attract a variety of land use activities in the redevelopment mix, (e.g., residential, commercial, industrial, etc.). The Pilot Cities each have brownfields in nonattainment areas. The Baltimore and Dallas participants indicated that they were not aware of any direct link between clean air requirements and the ability to proceed with brownfields redevelopment projects. Chicago, however, has sought to attract a full array of redevelopment land use activities, including industrial, and some recent redevelopment projects were overtly impacted by air quality requirements. Baltimore and Dallas expressed a neutral attitude on industrial activity in the redevelopment areas, with a clear preference

for mixed-use activity and nonpolluting businesses. Dallas, however, expressed interest in better understanding area-wide business location decisions, and how businesses view air quality factors.

The discussion among the local government participants led to a decision to look more closely at how area businesses make location decisions. It was also determined that air quality requirements do not affect all businesses, but only the fraction that requires air permits to operate. While there may be some impact on non-industrial brownfields redevelopment (e.g., see below discussion on Atlantic Steel project), it was generally agreed that direct impacts might be more readily identified when the land use activity involved a major stationary source.

Three specific tasks were undertaken to examine whether or not air quality requirements impact business location decisions. The first task was to generate a summary of traditional location factors identified from the literature on location decisions for land use activities. A limited literature review was conducted. The

literature on this subject is sparse, perhaps because the requirements from the Clean Air Act Amendments of 1990 have not yet matured to the point where the effects of regulatory policy implementation can be easily identified. The literature was expected to yield some insights on efforts (e.g., surveys, cross-sectional statistical analyses, case studies) taken by other researchers to better understand the role of air quality policies on location decisions.

The second task involved a limited survey of businesses in the Pilot Project cities and surrounding areas. This effort was intended to examine location decision attitudes of businesses already located in nonattainment areas in the Pilot Project cities.

The third task was to conduct some limited, but focused, interviews of major national companies, some of which own and operate manufacturing facilities in the Pilot Project cities. The companies participating in the focus group shared some common characteristics including past or present plans to expand existing plant capacity in some areas, and sight new facilities in other cities.

The companies involved also are active in a national trade association and have a sophisticated knowledge of air regulations and the permit process. While the results of the company interviews are interesting, they should not be considered representative of industry trends. The various companies interviewed and their trade group can be characterized as having a strong interest in this subject; they have developed an advocacy program aimed at modifying current policy to make it easier to obtain construction, reconstruction and operating permits.

The results and findings of each of the tasks described above are presented in the following pages.

Summary of Industrial Location Factors from the Literature

Land use location decisions have been the subject of a substantial amount of research. Numerous efforts have been undertaken to characterize location decisions of different types of businesses. The motivation for these analyses has been to try to develop a rational science, or at least a rational explanation of location behavior. Such information provides a predictive capability that could prove a

valuable tool in planning and directing location decisions to favor one or more economic development goals. Public sector decision-makers could use this information to better direct tax and other incentives to businesses to locate in certain areas. In doing so, greater levels of employment would be achieved and local and regional economic multiplier effects would be maximized.

Models for predicting industrial location have been more or less successful. Some of the reasons for mixed success are that industrial location decisions are complex, involve a myriad of relevant factors. Further, businesses are rarely static and are subject to dynamic market forces that involve changing economic and social conditions. Facility location, expansion and relocation plans can literally change over-night.

The literature addressing manufacturing industry location factors is well established. Some of the traditionally important factors are listed below:

- Available land, cost of land
- Distance to raw materials
- Availability of infrastructure (e.g., roads, communications, etc.)
- Proximity to water source
- State and local taxes
- Local zoning requirements

- Availability of energy source
- Access to markets, (including local, regional and national consumer demand)
- Available labor pools, (including education, training, wage rates, etc.)
- Access to housing, schools, medical services

It should be pointed out that not all of these location factors are important in all location decision cases. Similarly, the relative importance of these factors varies by manufacturing industry, and even by firms within an industry.

Environmental concerns such as environmental regulations are relatively new factors to consider in location decisions. Two possible explanations may account in part for this. One is that the development of environmental regulations at the state and federal level is relatively recent. Most regulations have been introduced over the last three to four decades, slowly expanding the universe of regulated facilities. During this time, the air quality laws and regulations have been dynamic, and the examination of how they might influence manufacturing location decisions has not yet matured.

Another potential explanation is described to some extent in the existing literature. Robinson (1995) conducted a thorough

review of the literature to investigate if spatial differences in air pollution regulations have a significant effect on the location decisions of business. A key conclusion from that review indicated that “there is little strong evidence that environmental regulations have played a very important role in industrial location, at least for manufacturing as a whole” (p.239).

Puri (1995) investigated the role of air pollution control regulations in relation to business location decisions in California, a state that is considered to impose relatively strict air pollution requirements. Findings from that study indicated that “Air quality regulation is just one of the factors in business location decisions. Labor costs, taxes, and worker’s compensation are the leading factors...”, (p.vi). Puri also reported that business managers exhibited negative reactions to the “perceived” cost of air quality regulations due to “the time and uncertainty costs involved in the permitting/regulatory process” (p.v).

Both Robinson and Puri comment to some extent that the hard evidence does not support the thesis that clean air regulations create prohibitive barriers to industrial location, expansion or relocation. Robinson (p.231-232) cites other research that suggests that for some foreign firms, requirements for pollution controls have some

effect on location decisions, but that the impact is overall “insignificant or very small.”

The sparse literature in this area has failed to establish air regulations as an impediment to urban industrial redevelopment. Puri, however, suggests that the “...impacts of air quality regulations require continuing analysis” (p. vi), and efforts employed in California to lessen the burden on small businesses by providing market based incentives and special assistance should, for instance, be measured. This suggestion indicates that while there may be no clear evidence indicating clean air goals impede business relocation decisions, the public sector has instituted market based incentives and special assistance programs to aid businesses. Puri further suggests that these efforts may be geared toward dealing with industry’s frustration with obtaining permits to relocate.

Robinson (p.239) suggests that the lack of evidence linking air regulations to industrial location factors may be due to asking broad questions, when more narrowly defined questions could be addressed to more narrowly defined industry segments. This insight is important because it raises the issue of who is asked what questions, and how are they asked.

Additional approaches can be employed to generate information concerning whether air quality regulations impact industrial redevelopment of brownfields sites, although many do not offer information that is statistically representative of the industry involved, or industry in general. For one, anecdotal information derived from case studies can be useful. This type of information, however, can not be extrapolated to represent broad or even narrow segments of industry. Anecdotal information derived from interviewing individual companies provides, in a sense, multiple case study information. This information, while informative, is still not representative of an industry. The interview approach also may be prone to bias. This approach offers an opportunity, however, to gauge the varied sensitivity different businesses have to different location factors.

Another approach involves the use of business surveys. While the survey approach can be helpful in illuminating some aspects of location decisions, drawing conclusions, and generalizing to the broader population suffers from severe restrictions on statistical protocols and sampling technique. Results from such surveys could be misleading. For example, individual managers who respond to surveys “may be far removed from the real

decision-making process” (Robinson p. 228) – especially in big companies where decisions are seldom made by a single manager. The survey approach may also tend to bias responses by leading managers, who choose environmental regulations as more important than other location factors.

Another approach involves the use of cross-sectional analyses. These types of analyses generally rely on statistical associations between observed location decisions and the presence of environmental regulations. Robinson (p. 229) points out that this type of research often deals with branch openings. One of the major limitations of this type of analysis is that it involves using information from published sources that are descriptive of discrete, historical events. And, unless a survey or case-study approach is used in conjunction with a cross-sectional analysis, the findings are based on inference, are generally insensitive, and tend to mask the decision-making process.

This brief review suggests that it is difficult, if not impossible, to generate accurate and representative information from the business community to adequately address whether air quality regulations impact industrial location decisions. There is no easy way to get accurate and sensitive information from the

business community on this subject. It may, in fact, be impossible to obtain irrefutable evidence on this subject.

It was therefore decided, for the purposes of this examination, to attempt to generate information that at least sheds some light on the relationship between air quality goals and manufacturing industry location decisions. Two of the Pilots chose to conduct a business survey and the USCM staff conducted interviews with a small number of companies with recent experience in location decisions. While each of these approaches suffers from methodological inadequacies, together they have the potential to generate descriptive information on the matter at hand.

More specifically, the survey and focus group approaches can be useful in identifying and characterizing the particular problems some business managers perceive in conjunction with air quality regulations. This information may prove useful for local governments in their efforts to better understand the challenges to successfully including industrial land use activities as an option in the brownfield redevelopment.

Pilot Cities Business Survey

The Clean Air/Brownfields Pilot participants

decided that a business survey would be conducted in an attempt to generate information on the location decision processes of local companies. A survey instrument, (see Appendix), was developed with input from the Conference of Mayors staff, the three Pilot cities, the U.S. EPA, the U.S. Department of Commerce Economic Development Administration, and others. The survey was drafted in a manner that was intended to limit leading respondents to identify environmental regulations, and regulatory programs as a major location factor.

The total number of surveys sent out was 363. Baltimore sent out 163 business surveys, and Dallas sent out 200. Resource restraints limited the ability to conduct the necessary survey follow-up to ensure a robust survey response rate.

Chicago declined to participate in the survey effort. Chicago had already concluded that air quality regulations impede economic redevelopment and brownfields redevelopment, and therefore saw no reason to conduct a survey in the area. The Chicago participant explained this perspective by noting that the current air quality designation status subjects new industrial sources (whether expansions, relocations, etc.) to a more costly and time-consuming air permit

process. This situation makes it more expensive for a business to locate in the city, and they are often led to choose a less expensive area.

The Chicago participant also indicated that Chicago differs from the other Pilot cities in one important respect: outside the nonattainment area, rural and agricultural land use activities dominate. Thus, Chicago does not really compete for manufacturing industry with the surrounding attainment areas. Rather, it competes nationally to attract industrial establishments. Baltimore and Dallas, on the other hand, have industrial activity in the attainment areas surrounding the nonattainment area.

Survey Response

The survey response rate was very low: ten out of 363. This was expected from a survey of this nature. The research team had resource limitations that prevented aggressive survey response follow-up, and since the businesses were asked about recent or future location decisions, many potential respondents involved in current projects may have determined the survey did not apply to them.

Seven of the ten respondents were from

the Dallas survey, while the remaining respondents were from the Baltimore survey. The information presented here should be taken in the context that it offers some insights on the industrial location decision process and experience of just a few businesses in the Pilot Cities and their surrounding areas.

A summary of the survey respondents is presented in Table 2-1. The ten responding companies exhibit diverse business lines, and the actual respondents ranged from President to Manager. These companies had experience with site selection(s) from 1984 to 1999. Some of them considered all locations, (i.e., inner city, suburbs, rural), some only considered the suburbs, and some considered inner city and rural areas. An elaborate analysis of ten businesses is not warranted since this limited number cannot be generalized to the larger industrial community.

Industry Interviews

Neither the literature review nor the business survey were particularly revealing concerning the link between brownfields redevelopment and air quality regulations. As a result, the local government participants

decided that some useful information might be generated through direct industry interviews.

This section describes the results from direct industry interviews with five national companies on how they view the relationship between air regulations and business location decisions. The companies interviewed are members of the Council of Industrial Boiler Owners, (CIBO), a nonprofit trade organization. CIBO is known as the premier trade group for the industrial energy sector, and many of the active members are responsible for air permits for their companies. Since the member companies are involved in manufacturing and energy production, it was felt that they would have both recent siting experience and a relatively sophisticated understanding of air quality programs and regulations. It should be pointed out that the information reported here should be subject to the qualifications set forth in the introduction to this chapter.

For purposes of eliciting information, the interviewees were given a set of questions derived from the business survey, with a number of modifications to allow responses to be more open-ended. The set of questions is attached in the appendix.

Table 2-1: Summary Profile of Survey Respondents

Business Line	Respondent's Position	Year of Site Selection	City of Origin	New Site	Locations Considered	Considered Brownfields
Construction	Supervisor	1999	Dallas	Dallas Expansion	Suburbs	No
Solder Mfg	Operations Manager	1990	Dallas	Texas	Suburbs	No
Concrete Recycling	Vice President	1996	Dallas	Other State	Inner City Suburbs, Rural	Yes
Masonry Mfg	VP-Finance	1997	Dallas	Dallas	Inner City	No
Casting, Machinery	Manager	1984	Ft. Worth	Ft. Worth	Inner City Suburbs, Rural	No
Municipal Solid Waste Disposal	District Landfill Manager	1993-97	Ft. Worth	Ft. Worth	Suburbs, Rural	Yes
Manufacturing	Vice President	1984	Dallas	Dallas Expansion	Suburbs. Rural	No
Sporting Goods	Financial Officer	1996	Other	Baltimore	Inner City Suburbs	No
Pipe and Supply Distribution	President	1997	Baltimore	Baltimore Expansion	Inner City Suburbs, Rural	Yes
Specialty Chemicals Mfg.	Compensation Analyst	1999	Florida	Columbia, MD	Blank	No

Description of Industry Sectors Participating in the Interviews

The interviews were conducted jointly, in an open-ended dialogue that was guided by the interview questions. The five companies interviewed were large, national companies that have been and are doing business in multiple states. All of the companies are engaged in manufacturing or power production, but do not include electric utilities. Also, each of the companies supports either engineering or environmental engineering groups responsible in part for obtaining air permits for their respective company production units.

The five companies are engaged in activities in multiple industry sectors that have been subject to environmental regulations for some time. They all employ combustion in boilers or other combustion devices, and/or produce process steam or electrical power for the production process.

The following industry segments were interviewed:

- Automotive manufacturing
- Chemicals manufacturing
- Energy services and co-generation
- Agricultural and food production
- Combustion and air pollution equipment supplier

The companies wished to remain anonymous for two reasons. First, companies that are publicly traded have concerns about shareholder value and reactions in the market when expansion plans are delayed or halted. Second, some companies are reluctant to discuss environmental permitting issues openly, and do not want to call attention to any particular project.

The companies had different points of view about the role of air quality regulations in location decisions. Responses to Question three (respondents were asked to describe examples where specific air regulations affected actual location decisions) by all of the national company representatives clearly indicate that each business views air quality regulations differently. Indeed, the range of responses from this small group is quite varied. A summary of some of the information gained from the interviews is presented below.

Automotive Manufacturing:

This Fortune 100 company has been involved with numerous production capacity location decisions. It has developed a formal location decision model that explicitly considers air pollution regulations along with traditional location factors. When the company decides to locate a new or expanded production unit, real estate

managers are responsible for identifying suitable candidate sites. The primary location factors at this stage of the process are land availability and land cost.

The firm brings in other significant factors once the candidate site is identified. The group responsible for permitting, engineering and/or operations (the regulatory management function) estimates the cost of the technology necessary to comply with air regulations. At this point, whether the site is in an attainment or nonattainment area makes a difference. If the site is in a nonattainment area, the cost for technology controls for key air pollutants are based on lowest achievable emissions reductions (LAER), regardless of cost. If, on the other hand, the site is in an attainment area, the cost for technology controls involves best available control technology (BACT), which do consider costs. The firm also considers the costs associated with other air regulation requirements, including New Source Review permitting and annual and cumulative compliance costs associated with permit conditions.

The representative from this company stated that air quality regulations are currently not a critical location factor, but are becoming more important in the decision-making process.

Chemicals Manufacturing:

A representative from a Fortune 100 chemical manufacturing company described experience with facility location decisions resulting from acquisitions and merger activities. He stated that these decisions are driven by factors affecting the cost of production and efforts to restructure and consolidate operations.

When large company mergers occur, there is usually some realignment of operations and production based on efforts to increase efficiencies. Decisions are made to shut down some operating units and expand or continue operations at other units. This company representative stated that if a unit is in a nonattainment area, then adding or increasing production units becomes a more important factor because the additional air emissions changes the permit status. This company representative suggested that a site in a nonattainment area is a negative factor due to added time and cost for permitting, as well as an uncertain outcome.

Energy Services Industry:

This national company specializes in refurbishing existing fossil-fueled power production units with natural gas/co-generation units. The company representative provided insights from his

experience with 18 projects in 1999, all between 10-30MW.

One proposed modernization project in a New England state would have converted a #6 oil-burning power plant, currently emitting between 200-300 ppm of NO_x, into a natural gas fired co-generation facility emitting about 15 ppm of NO_x. The state had previously adopted its own version of LAER, which requires any facility over 2MW to limit NO_x emissions to 2-3 ppm. It was determined that the cost of NO_x pollution control for a small unit is prohibitive, and therefore the project was canceled.

This example suggests that replacing older, more polluting energy generation sources with smaller, less polluting natural gas-fired turbines may not be economical because of the additional technology and compliance costs. Companies with "grandfathered" facilities that are less environmentally efficient than modern state-of-the-art technology may continue to rely on their existing permits simply because it is cheaper and more convenient than seeking regulatory approval for modernization.

This company representative also stated that his firm is concerned about the time it takes to obtain an operating permit and that

this timing plays a role in location decisions. This company, because of its clients, must be certain about a project's start and completion time, especially when a large capital investment is involved. When the permit is subject to the LAER and NSR process, it is difficult, if not impossible, to guarantee firm time schedules, and this becomes a drawback for going forward with projects. Some states have taken measures to set limits for permit application review periods, and this may make a difference in those states.

The company representative did not say how big a facility (or production unit) must be in order to make a project viable. The company's experience suggests that projects below the 30 MW range are not feasible if LAER for NO_x is required. The company has a preference for locating new/replacement units in attainment areas in order to avoid the LAER requirements that make project economics more difficult.

Agricultural and Food Production:

A representative from a Fortune 100 agricultural and food production/processing company described his experience with location decisions involving three proposals for new or expanded production units, or relocation of units in the last two years. This representative is part of the review team that

looks at air quality compliance, and is responsible for obtaining operating permits for expansions and new product lines.

According to this representative, the review team handles proposals on a case-by-case basis. The proposals originate from internal groups within the company, or they are driven by a marketing joint venture with another party. When proposals to expand or locate are driven by opportunities to introduce new products to the market, there is usually a limited time window. He suggested that it is not feasible to wait 18 or more months to gain air permit modifications and approvals for process changes. Since the New Source Review (NSR) permit modification process is too costly and uncertain, the review team, in these cases, ordinarily advises these business units to seek production sites in Canada.

The significance of air quality rules in location decisions may be critical for some firms with existing plants that desire increased production units. In this situation, the current air quality designation around the existing plants plays an important role in the location decision. This representative pointed out that even small unit processing additions are subject to NSR and LAER in

nonattainment areas. For example, in a severe nonattainment area, a proposal to increase production is subject to NSR and LAER if it will emit 40 tons per year (tpy) or more. Thus, there is a reluctance to modify an existing facility permit in a severe nonattainment area because relatively minor emission increments may result in a lengthy permit process.

Combustion and Air Pollution Control Equipment Industry:

A representative from a large international combustion and pollution control equipment supplier expressed that there will likely be few, if any, expansion of utilities in the 22 states that are subject to further NO_x reductions under the ozone severe nonattainment status designation. He said that demand for his company's services and equipment has been impacted by this situation. He also stated an opinion based on his market experience that any new development will favor sites in attainment areas. Discussion with EPA participants indicated that in their experience, they have received numerous permit applications involving new NO_x sources in the 22 states in the SIP call.

Summary

This chapter set out to investigate whether or not there was/is a correlation between brownfields redevelopment and air quality requirements. The investigation included three efforts: 1) review the literature on traditional location factors and whether or not air quality goals are among them; 2) conduct a survey of business establishments in and around the Pilot Cities to see if air regulations influence actual business location decisions; and, 3) gather similar information through interviews with some national companies that make multiple location decisions for industrial activities that are regulated as major stationary sources. The activities employed to examine each of these concerns have been described above, and the discussion below offers a summary.

The literature is sparse on this subject, and offers only vague evidence that air regulations play a role in industrial location decisions. No information was found to suggest that mixed-use brownfields redevelopment projects were impeded by requirements to meet ambient air quality goals. An exception is described in Chapter three (Atlantic Steel case), but there is no indication that such exceptions are more than just exceptions. The literature focused on the

southern California experience suggests that air regulations impose additional cost for controls and permitting for some businesses in some places.

It is worth mentioning that definitive research in this area is difficult because significant legislative and regulatory developments unfold over time, and the substantial lag period between adoption and implementation of new air policy complicates the time-period of analysis. For example, the 1990 Clean Air Act Amendments have resulted in the development of EPA rules over the last decade, and the implementation of the full array of amendments is still not complete. During this period, new policies and rules governing stationary sources have been proposed and promulgated, at a staggered rate. Some of these rules are far-reaching, such as air quality attainment designation and implementation of new NO_x control requirements to relieve ozone problems.

Similarly, there is no easy way to examine the effect of one air quality goal or regulation when major sources are affected by multiple air pollution regulations for technology, compliance with performance standards, monitoring and record-keeping. Currently, the literature does not offer insights on how these converging policies might affect brownfields

redevelopment, with or without an industrial activity. Thus, the current state-of-the-literature is of little help in explaining how important air quality goals might be to mixed-use or industrial redevelopment on brownfield sites.

The second effort — an attempt to generate information from a survey of business establishments in and around the Pilot Cities of Baltimore and Dallas — yielded disappointing results. A very low response rate prevents drawing conclusions about business attitudes or experiences. The few respondents who had made business location decisions identified traditional location factors as important to their decisions. There was some mention, however, that environmental regulations were a consideration, and these included water, solid waste and air regulations. There was no mention that air regulations were a critical factor in the location decision.

The third effort to generate information involved interviews with national companies with considerable recent location decision experience. The industry interviews were designed to allow business managers (respondents/participants) to identify and comment on particular problems they might perceive in conjunction with their location efforts and air quality regulations.

The five industry interviews, involving heavily regulated businesses, indicated that air regulations do play an important role in the location decision process, but company representatives found it difficult to rank air regulations compared to other environmental regulations such as water quality or solid waste. One company, however, has a formal model to analyze and factor air requirements into the decision process.

When business managers were asked for specific examples of how air regulations affect location decisions, and how they are integrated as a decision factor, the answers were quite varied. One company representative stated the extreme position that ozone nonattainment status would preclude any new or expanded facilities that are NO_x emitting sources from obtaining an operating permit. Another company representative stated that siting smaller energy generation units in ozone nonattainment areas is not economical because of the cost of NO_x controls, even though the newer, more efficient technology yields a greater than 90 percent reduction in NO_x emissions compared to current facility emissions.

These efforts to better understand the correlation between air regulations and industry location factors have provided limited

confirmation that air quality goals and the policies and regulations intended to implement them are a currently a factor considered by some manufacturing businesses in their location decision-making. This link was the strongest among the national companies that are heavily regulated, and have considerable facility siting experience. The national company

representatives also indicated that air regulations vary in importance, based on both where a site is and what size the project is in terms of emissions volume.

At the present time, there is no strong evidence that Clean Air goals impede brownfields redevelopment. This examination, however, identified a number of areas of

uncertainty in methodological approach. For example, generating representative data from the business community was impossible due to project resource constraints. Secondly, any research in this area suffers from the time lag impact of the new regulations. Therefore, the full impact may not be measurable until some time in the future.

Chapter 3

Brownfields Redevelopment and Clean Air Quality Considerations

This chapter describes how each of our pilot cities is addressing brownfield redevelopment, and includes three sample brownfield redevelopment projects that we believe can serve as models for other communities.

All of our pilot cities are concerned with local air quality. But only recently have they started to incorporate air quality considerations into their brownfields redevelopment initiatives. This is because they are only just starting to understand how the two interact with one another—in both negative and positive ways. On the negative side, stringent air pollution controls could conceivably preclude businesses from considering brownfields sites in nonattainment areas. On the positive side, redeveloping a brownfield can be an opportunity to encourage new land use activities that are less polluting.

Our exploration of the relationship between air quality regulations and brownfields

redevelopment is aided by recent research completed by EPA's Office of Policy, Economics, and Innovation (OPEI), which compares the air quality impacts of undertaking development at brownfields sites versus greenfields sites. We have woven in material from this report where it applies to one of our case study sites to show the potential for air quality benefits from infill development.

BALTIMORE

The Baltimore Brownfield Initiative

Baltimore's first effort to clean up a brownfield site dates back to the 1960's when the historic Inner Harbor was redeveloped—before the term “brownfield” was even in use. However, this type of redevelopment did not become commonplace in Baltimore until 1995, when former Mayor Kurt Schmoke launched the Baltimore Brownfield Initiative. Since that time, more than 30 sites have been assessed for environmental contamination as a first step toward brownfields revitalization. The program's long-term goal is to redevelop the many brownfields properties in the city.

The Baltimore Brownfield Initiative was created to help pool as many public and private funding sources to address the city's substantial brownfields problem. For this reason, a brownfields council was formed, which includes local, state and federal stakeholders.

Baltimore has received significant federal assistance for its brownfields redevelopment efforts. Baltimore's designation by EPA as a “Brownfields Showcase Community” has helped the city garner attention and harness important resources, pushing projects to completion. With funding from HUD, for instance, Baltimore was able to produce an inventory of vacant and under-utilized brownfield sites in its empowerment zone, as well as initiate joint planning on the development of the Fairfield Ecological Industrial Park.

One of Baltimore's most active groups, the Historic East Baltimore Community Action Coalition, is conducting assessments of several former industrial sites on the city's east side, including an abandoned brewery and an abandoned press. Another four sites

in Baltimore have been brought into the state's voluntary cleanup program (VCP).

As a result of these efforts, the city is seeing private sector interest in places that previously had been left for dead. For example:

- The former site of Parker Metal Decorating, located in Baltimore's empowerment zone, has successfully gone through the state's VCP, and will be redeveloped as an office building employing more than 100 people.
- The former American Can factory in Canton is currently in the state's VCP. There are now plans for a mixed-use project, featuring modern retail and offices on the site. An adhesive manufacturer will be headquartered here.
- The 33-acre former ASARCO site, also in Canton, has attracted an \$11.5 million investment, including one million dollars for cleanup. The site is being transformed into a multi-use industrial center.
- The former Koppers Chemical site in west Baltimore will be redeveloped into 110 market-rate townhouses after cleanup. Once cleanup is complete, site redevelopment will be overseen by the state's environmental department.
- A local pharmaceutical manufacturer is expanding its operations onto a 4-acre

former US Army site in the Holabird Industrial Park.

A Case Study Example – Chesapeake Business Center

The site of this redevelopment project was once home to a working tank farm, an oil refinery, and an asphalt plant. The plan is to transform this 80-acre brownfield site into what will be called the Chesapeake Business Center (CBC). Exxon currently owns the site and is cleaning it up under an agreement with the state's oil control program.

The CBC will be the first industrial park developed by the city of Baltimore since 1979, when the city purchased Fort Holabird from the federal government. After the city acquires this site, Exxon will remain responsible for cleanup, but not for capping any site contaminants. When fully developed, the CBC will offer 1.3 million square feet of state-of-the-art industrial space within minutes of the Port of Baltimore and Interstate-95.

The city hopes the project will create as many as 1,500 jobs. The Baltimore Development Corporation is providing incentives to companies who locate in the CBC to hire a certain number of empowerment zone

residents and former welfare recipients. Establishing an image-conscious industrial park in this highly-visible location in southeast Baltimore is intended to promote the Canton industrial area as a location for new business investment. The cleanup and redevelopment of the former oil tank farm will also reinforce neighborhood revitalization efforts in nearby residential and commercial areas.

The City of Baltimore is drawing on many sources of funding for this project. Financing for Phase 1 includes: a \$975,000 EPA brownfields economic development initiative or BEDI grant; a \$1.5 million EDA public works grant; a \$5 million HUD Section 108 loan; \$3 million in loans and grants from the city and state; a \$550,000 customized training grant from the Empowerment Zone and the Office of Employment Development; a \$100,000 grant from the Baltimore Urban League for welfare-to-work training; and a \$3.5 million private loan for construction. The city has also committed \$3.6 million in road improvements.

Quantifying the Potential Air Benefits

The EPA OPEI report, "Transportation and Environmental Impacts of Infill versus

Greenfield Development,” attempts to estimate the improvements in air quality due to redevelopment of the CBC site versus comparable development on a greenfield site outside the city (although several methodologies are used in the OPEI report, the results of only one methodology are discussed here). Air benefits are expected to come about from avoided vehicle miles traveled.

For its air quality/brownfields model, EPA has assumed that in-fill development at the CBC brownfields site will create 800 new jobs and attract 400 new households to the area. EPA estimates that creating a development scenario that would locate the same number of houses and jobs on a greenfield outside of Baltimore in Carroll County would use up 270 acres (compared to the 80 acres at the CBC site).

Translated into soot and smog, EPA calculates that the CBC infill site would generate 0.05 tons of NOx and .11 tons of VOCs per day, compared to 0.07 tons of NOx and 0.15 tons VOCs per day at the comparative greenfield site. This means the greenfield development would create 35 percent more NOx and VOC emissions than the CBC infill development.

CHICAGO

The Chicago Brownfield Initiative

Chicago’s Brownfield Initiative began in 1993 with the twin goals of improving environmental quality and the city’s economic health. The City started its program with an allocation of \$2 million for environmental testing, cleanup, and redevelopment on five

properties. The selected properties were either abandoned or owned by the city. In each case, the city identified the extent of contamination, paid for the necessary cleanup, and developed a marketing plan in partnership with a prospective site owner. Only \$850,000 of the \$2 million allocated for the five sites was spent.

The City created a “brownfields forum” in 1995 to explore approaches to making brownfields economically viable. Initially funded by a grant from the MacArthur Foundation, the forum brought together representatives from government, environmental groups, the legal community, industry, banking, and developers for six months of dialogue and coalition building. By forging new working relationships among these public, private, and nonprofit sectors, the forum helped each stakeholder group define a role for itself with respect to brownfields redevelopment. It also made headway on crafting new tools that could be used to jump-start private development. The forum’s final report identified 60 barriers to redevelopment and laid out an action plan for addressing them. Chicago has continued the work of the forum with a grant from EPA. A 1997 progress report found that while there are continuing barriers to brownfield redevelopment, site-remediation has gotten easier.

Table 3-1: Estimated Total Emissions (tons/day)

Site Scenario	NOx	VOC
Infill Development	0.05	0.11
Greenfield Development	0.07	0.15
Difference	40% higher emissions for greenfield than infill	36% higher emissions for greenfield than infill

The initial success of the 1993 pilot, coupled with the work of the brownfields forum, has enabled the city to establish a more comprehensive remediation and redevelopment program. The city's current program brings together the municipal pieces that are critical for successful brownfields redevelopment – property acquisition/assemblage, remediation, and marketing. It is led by a multi-departmental team from the Mayor's Office, including the city's legal counsel and its departments of environment, planning and development.

The city enters into the state's voluntary cleanup program sites that have been designated within its borders as brownfields. This provides site owners the opportunity to obtain a letter of "no further remediation," if certain conditions are met. A "no further remediation" letter provides the current site owner a level of liability protection from further state action, providing assurance for potential purchasers that the site has been cleaned to end-use standards set by the state EPA. A Memorandum of Agreement between the State of Illinois and the U.S EPA provides a division of labor clarifying regulatory responsibility for brownfields sites. The City of Chicago actively encourages private owners of brownfield sites to perform voluntary cleanups under the program in order to expedite the redevelopment process.

Chicago works to achieve environmental improvements beyond cleanup by incorporating environmental-friendly elements into the redevelopment part of its projects. For example, one city redevelopment project – the remediation of an illegal dump – will house a solar panel manufacturer in a "green" building when finished. Another will include conservation buffers of native plantings and innovative stormwater management techniques.

The remediation of the illegal dump-site is worth further mention because it illustrates how air quality considerations can be successfully taken into account in a brownfield redevelopment. The 17-acre site was occupied by Sacramento Crushing, a construction and demolition debris recycling operation. The city closed the operation in 1996 and sued the operator for violating the city's environmental laws. Shortly afterwards, the city became the property receiver and obtained ownership of the site. The city spent approximately \$9.5 million to clean the site, with assistance from a number of financial sources: a HUD Section 108 Loan (that will be repaid through Tax Increment Financing), "brownfields bonds", the city's corporate funds, and the sale of aggregate from the site to other city agencies and the private sector.

The city has found a solar photovoltaic equipment manufacturer, Chicago Solar, to locate at the site. Chicago Solar is a new business venture of Spire Corporation, one of the world's largest manufacturers of solar equipment. The redevelopment project is expected to bring more than 100 jobs to the area.

The solar panels produced by Chicago Solar will be used at this site and at other redevelopment sites throughout the city. One site, a former landfill, will utilize the solar panels to cap environmental contamination and produce energy. The idea of turning brownfields into energy-producing sites is a concept known as "brightfields" and is currently being explored by the U.S. Department of Energy. At its own site, Chicago Solar's panels will supply part of the electricity needs and serve as a place for solar demonstrations and education.

The city and Commonwealth Edison are purchasing a total of \$8 million of photovoltaic equipment from Chicago Solar. The solar systems purchased will be installed at schools, colleges, government buildings, and the City's museums. This type of alternative power generation will have an immediate impact on local/regional air emissions by increasing power generation without the

normal air emissions derived from standard fossil fuels.

In addition, the site will house Greenhorns Chicago, the city's community greening and job training program. This program trains low-income residents to work in landscaping and horticultural professions.

A Case Study Example – West Pullman Industrial Development Redevelopment Project

West Pullman was once a thriving industrial area, home to Pullman Car Works, various metal works and foundries, auto salvage yards, lumber yards, and a paint manufacturer. The area—located on the south side of Chicago—was first developed in the 1850s after the opening of the Illinois/Michigan Central rail station and the arrival of the Pullman Palace Car Works. Growth in the 1940s, spurred by World War II, led to additional business activity in the area, including International Harvester and Dutch Boy Paints. But after the war, urban decentralization led to the decline of the area, and businesses began to relocate outside of the city. The remnants of the former industrial operations are still present, with decaying and structurally unstable buildings, as well as soil contamination.

The site was recently renamed the West Pullman Industrial Redevelopment Area (WIRA), and was targeted by the city as a brownfield site slated for infill redevelopment. It consists of 160 acres and is divided into 17 sub-sites. Aside from the challenge of remediating this former industrial site, the city must buy up 160 acres of land owned by at least two-dozen different entities, and reassemble it so it will be attractive to potential purchasers. Thus far, the City has acquired approximately 80 of the total 160 acres.

Another challenge is that the city does not know who the end users are by the property. In most redevelopment projects to date, the city has cleaned and prepared sites for use for a particular buyer. In this case, without knowing the end use of the property, it has been difficult to determine the appropriate degree and kind of remediation.

The city has employed several methods in obtaining the property for redevelopment. Approximately half of the property (45 acres) has been acquired by paying off delinquent taxes. The city also is looking at other approaches to obtaining properties: where liens have been placed; through settlements of environmental enforcement cases; by negotiating a sale with the owner; or through condemnation of the property (deducting the

amount of any environmental liability in the latter two cases).

Environmental assessment of a property will begin as soon as the city secures the necessary access agreements. The city will use the findings of the environmental assessment to strategize cleanup options.

Once it has control of the property, the city will enroll it in the state's site remediation program. The city's goal is to obtain environmental closure on the property in the form of a comprehensive "No Further Remediation Letter" from the State. The city has set aside \$8 million of HUD Section 108 money and \$950,000 in supplemental environmental program money to pay for environmental assessments and cleanup.

Quantifying the Potential Air Benefits of the Pilot Project

The study consultants, in consultation with Chicago Department of the Environment (DOE), the Chicago Area Transportation Study (CATS, the regional transportation modeling agency), and other pilot project staff, selected the West Pullman brownfield site as the infill site, and a site in suburban Aurora for the comparative greenfield

development. As was the case for the other test cities, here too the sites are typical of their respective types of redevelopment and development. Participation by Chicago DOE and CATS help assure that the two locations were fair examples of each site type.

The West Pullman brownfield site contains 140 acres. The City proposes to redevelop it with 3200 jobs: 1700 industrial, 400 warehouse/distribution, and 1100 research and development and general office jobs.

A 210-acre suburban greenfield was selected in Aurora, at the intersection of I-88 and Orchard Road, in part to typify the kind of highly accessible site sought in suburban development. Employment was assumed to be the same as at the infill site.

Results Discussion

Results table 3-2 presents slightly more detail than the other results tables because the results are counterintuitive and the additional detail sheds light on the reasons behind this result.

The fact that the region with the infill site would produce 50,000 fewer vehicle trips per day than the region with the greenfield site suggests that the infill site ought to have the

potential to reduce emissions. However, given that the scenario in question was simply the addition of 3,200 jobs in each case, common sense calls this result into question. Past research on the impacts of additional jobs on trip generation rates as they relate to locational differences, even with significant trip substitution occurring, suggests these results cannot be supported. In other words, it is not credible to suggest that changing the location of 3,200 jobs should lead to such a large change in vehicle trips.

On the other hand, the infill location showed a slight increase in regional VMT and emissions. In cases where the infill development contributes to a jobs/housing imbalance, where infill is not well served by transit, or where long trips are required to access the infill location, this might be viewed as a reasonable outcome. However, it is not evident that any of these phenomenon are at play here. To the contrary, the model is reflecting a reduction of 50,000 trips, yet simultaneously predicts a slight increase in VMT and emissions. Like the Baltimore case study, these results suggest another approach is needed if one is to accurately gauge the impact of infill development on transportation and air quality outcomes.

CATS believes that the regional model

operates at too large a scale to effectively analyze the impact of a single development consisting of 3200 jobs. In the transmission memo for the results, the CATS project head reiterated this point:

- *The difference in the measures between these two scenarios is generally not significant enough to draw any real conclusions. The measured changes are as likely to be due to differences in how the model ran (e.g. how close to the stopping criterion) as they are to any real differences between the scenarios. The scale of your test and the state of regional travel level simulation are not properly matched.*

Memo "Measures from infill/greenfield modeling" from Dean Englund, CATS, to Alex Holt, Chicago Department of the Environment, April 14, 2000.

In short, the project was not large enough in a regional context to rise above the noise in the model, an explanation that is consistent with the irreconcilable results obtained.

The Chicago experience, then, is consistent with the Baltimore findings in that a project must be a certain size before the regional model is a useful tool with which to directly predict the project's impact.

Unfortunately, we were not able to work with Chicago to establish what a minimum necessary project size would be to register in the regional model. Further, because Chicago and Baltimore do not run the same model, we

cannot say whether a Chicago-sized project in Baltimore would have been large enough to obtain robust results in Baltimore. However the Chicago results join with the Baltimore results in suggesting that scale is an

important consideration in choosing among methodologies.

It appears that the current modeling runs will not be enough to help EPA create clear guidance on how to establish a minimum development size necessary to achieve robust modeling results. This is not entirely surprising. The original study design asked whether development size matter matters, and the answer is an obvious yes. The minimum size will differ from metropolitan area to metropolitan area, depending on the quality of the area's data, the structure and sophistication of the model, and, of course, the absolute (population) size of the area.

The lack of a defined minimum development size should not be problematic. If regions seek to recognize emissions reductions for small developments that may lie below the noise level of their particular model, the resulting reduction will be very small, and the risk of accepting that reduction as a genuine improvement is correspondingly low. As the size of the development increases, the robustness of the result will also increase. Thus, developments that are large, relative to the region's population and emissions budget, such as Atlantic Steel—the next case study, are almost certainly above the model's noise threshold. The more

Table 3-2: Estimated Total Emissions (tons/day)

Total regional weekday vehicle emissions (tons/day)	Greenfield site	Infill site	Infill as a % of greenfield
Hydrocarbons (VOC)	215.3	215.75	100.21%
NOx	360.86	361.07	100.06%
CO	1556.05	1559.4	100.22%
Total weekday VMT for the metropolitan area	195,441,199	195,594,851	100.08%
Total weekday VHT for the metropolitan area	8,155,809	8,191,981	100.44%
Total weekday vehicle trips (including intrazonals):			
HBW	5,125,810	5,125,333	
HNW	6,395,117	6,395,119	
NHB	5,163,577	5,163,573	
Other	2,292,943	2,242,782	
Total (Infill – greenfield)	18,977,447	18,926,807 -50,640	99.73%
Total weekday person trips (including intrazonals):			
By vehicle	20,081,534	20,081,016	100.00%
By transit	1,514,127	1,514,473	100.02%

important line of defense against false benefits, however, is simply a requirement that analyses demonstrate internal consistency. The Baltimore Methodology One region-wide analysis showed benefits from infill, but the analysis was inconsistent with other regional runs. Additional study, such as site level analysis, would be required in order to properly recognize any reductions in the rate of emissions growth.

West Pullman analysis:

In summary, with respect to model results and the size of development:

1. Many regional travel models will give unreliable results if used to analyze likely travel changes from changes in development patterns below a certain threshold size. That size varies from metro area to metro area, and can best be determined by local modeling officials.
2. As with all modeling results, outcomes should be analyzed for internal consistency and compared to basic interactions among land use, transportation, and air quality articulated in the literature.

DALLAS

The Dallas Brownfield Initiative

The City of Dallas established its brownfields initiative in the mid-1990s. Its approach has been to avoid creating a government “blacklist” of abandoned and environmentally dirty sites. Rather, the City has supported a “brownfields success stories” list, examples of sites where cleanup activity is underway. Their thinking is that stigmatizing sites with negative publicity does little to encourage their redevelopment and cleanup.

Dallas’s brownfields “success stories” list contains at least 21 sites. Some notable successes include relatively large parcels of land that were contaminated with a combination of organic and inorganic chemicals and were remediated through soil excavation processes. One site involved a 26.4-acre former concrete pipe manufacturing plant that was unused for approximately nine years, and is now the home for a pallet recycling business that employs residents from the surrounding low income, minority neighborhood. Another site involved a 22.5-acre area that housed a gas station, a metal finishing business, a battery manufacturer, an automotive repair shop, and a paint and varnish manufacturing facility, and was vacant for 20 years. The site is now

home to a 540-unit apartment complex, which includes 108 units dedicated to affordable housing. Yet another Dallas brownfields success story is a 27-acre site that included a mobile home park, a lodge, an oil company laboratory, a lumberyard, and an apartment building. This site is in the process of being redeveloped into a 650-unit multi-family residential complex that will include 128 units of affordable housing.

Pilot Project Case Example – South Side on Lamar

This site, referred to as the “South Side on Lamar” development, has the potential to be Dallas’s greatest “brownfield success story” because of its prime location and potential for productive land use.

Once home to the Sears and Roebuck Catalog Merchandise Center, this site has not been in operation since the mid-1980s. It was originally built in phases, beginning in 1912. The site complex consists of five buildings, including a nine-story office/warehouse that has a rail line through its center; a three-story warehouse; a five-story warehouse; a one-story training center; a two-story cafeteria; a former auto service center; and a surface parking lot. The facility has over 1.4 million

square feet of building with parking capacity of 1,500 spaces. The environmental issues at the site have ranged from underground storage tanks, asbestos-containing materials, lead-based paint—all of which have required extensive remediation.

The 17.5-acre South Side on Lamar site is being redeveloped as a mixed-use property, with a rehabilitated historical landmark, residential lofts, business-commercial space, and retail/hospitality space. This development is just south of the Dallas Central Business District, borders the Cedars Tax Increment Financing (TIF) District, and overlooks the Trinity River Corridor. The development is expected to create 1,500 jobs and have 455 residential units.

Using its historic preservation incentives program, the City of Dallas authorized a total of \$9.2 million worth of exemptions from city real property taxes for 10 to 15 years (depending on parcel). HUD also provided a \$65 million mortgage loan guarantee to help underwrite this redevelopment project. A Phase One environmental site assessment was conducted through EPA's brownfields program. One parcel has been donated to the City of Dallas and will be the site of a new Dallas Police Headquarters building, a \$58 million project.

Quantifying the Potential Air Benefits of the Pilot Project

The South Side on Lamar project is also considered in EPA's new report on transportation and environmental impacts of infill versus greenfield development. The EPA study compares the Dallas infill site to a greenfield site in the Highway 121 corridor in McKinney, Texas, approximately 31 miles north of the Dallas central business district. Both the infill development and greenfield development were modeled in the study using a mixed-use development scenario that involved placing 400 households and 1,500 jobs on each site.

According to the results of the EPA analysis, the South Side on Lamar site would

generate 0.103 tons of NOx per day compared to 0.118 tons per day at the greenfield site. Therefore, the South Side on Lamar development represents avoided emissions equivalent to 0.015 tons per day of NOx. Similar potential benefits are expected for VOC emissions: 0.064 tons per day at the Lamar site, versus 0.088 tons per day at the greenfield site.

Summary

This chapter presented information in three relevant areas examining whether clean air goals play a role in brownfields redevelopment efforts. The three areas included a description of the pilot cities' brownfields initiatives; case study descriptions of brownfields projects; and,

Table 3-3: Estimated Total Emissions (tons/day)

Site Scenario	NOx	VOC
Infill	0.103	0.064
Greenfield	0.118	0.088
Difference	87% higher emissions for greenfield than infill	73% higher emissions greenfield than infill

quantified estimates of the clean air benefits that are potentially achievable from infill development.

The pilot cities' brownfields initiatives described in this chapter illustrate the level of proactive local government efforts necessary to successfully return brownfield properties to productive use for the local economy. These stakeholder negotiation/decision-making processes highlight the timelines and arrangements required to identify and execute a site remediation solution, and to secure the financing necessary to redevelop the sites. Together, the cost of conducting the redevelopment process, and the cost of the remediation plan to achieve regulatory compliance become part of the "negative land value" associated with urban brownfield sites. State and Federal government subsidies to local governments continue to play an important role in the brownfields redevelopment process. The importance of the decisions made are further heightened by the potential long-term influence over the land use activity for that site.

The brownfields redevelopment case studies offered mixed information on the role that air quality concerns (such as nonattainment status) play in the brownfields initiatives and the individual remediation

projects. The Baltimore participants pointed out that the state of Maryland implements its authority for issuing stationary source permits to industry. Dallas also does not exercise primary authority for stationary source permitting. The relationship between air quality concerns and brownfields initiatives is a recent consideration and has not been traditionally addressed in an explicit form.

Recent experience in Chicago indicated that air quality considerations can play an important role in economic redevelopment efforts. In one brownfield redevelopment project situated in a nonattainment area, the need for emissions offsets became a critical factor in project success. Another project – the Sacramento Crushing redevelopment – illustrates how the city achieved multiple goals in a single solution: solar caps on a closed landfill, coupled with a solar equipment manufacturer, increased employment, ancillary commitments to install solar panels on city administration buildings, and an employment training center. The City of Chicago believes that industrial activity can be a part of the brownfields redevelopment mix, but restrictions on new development in nonattainment areas may impose additional development costs related to compliance with the Clean Air Act's LAER provisions and NSR permitting process. While Chicago has

demonstrated the ability to succeed with innovative brownfields redevelopment projects with recognized air quality benefits, the LAER and NSR provisions applicable in nonattainment areas present another impediment to redevelopment.

The EPA has provided us with estimates of the avoided vehicular emissions from infill and greenfield development based on the three pilot city case studies. This was intended to illustrate how choosing urban redevelopment over fringe and suburban site locations can influence local air quality. The potential for avoiding or reducing emissions from vehicular miles traveled through mixed-use design is important because mobile sources are beginning to play a greater role than stationary sources in the urban emissions inventory. While infill development is more of a convenient than a precise surrogate for urban economic and brownfields redevelopment, it suggests a similar potential for achieving air benefits from avoided emissions.

In seeking to quantify avoided emissions, EPA issued the guidance document, "Improving Air Quality Through Land Use Activities," in January 2001. The guidance outlines how the air quality benefits of land use activities may be included in a SIP or

conformity determination, and provides guidelines for quantifying the emissions reductions and meeting EPA reporting criteria.

Further guidance on the quantification of air quality benefits from specific land use measures is under development.

Chapter 4

Characterizing the Relationship Between Clean Air Policy and Urban Redevelopment

The Clean Air/Brownfields Partnership Pilot was designed to bring together local, state and federal government representatives to examine what effects clean air policy might have on efforts by local governments to achieve brownfields redevelopment goals. The purpose of this chapter is to discuss some of the results of the examination, drawn primarily from information shared by representatives from the Pilot cities, from state and federal environmental agencies, as well as from information related to location decisions gathered from the industrial sector. It should be noted that this paper serves not as a scientific research paper but as a compilation of comments, discussion, and interviews with a variety of interested stakeholders. Our conclusions are based in part on the research conducted, as well as on the discussion sessions that were held throughout the course of the two-year project. Where appropriate, a distinction is made between how these conclusions were developed.

One key result from considering the discussion and the limited information from the business community is that air quality policies are considered as a location factor by the businesses within the manufacturing industry that are regulated as stationary sources. There is some indication from the business community that air quality requirements are of growing importance as a location factor, especially when potential sites are situated in nonattainment areas. One of the Pilot city participants also described how a brownfields site in Chicago faced difficulty in achieving success when air quality requirements became the critical factor in proceeding with the project. Local governments have expressed concern that if their brownfields redevelopment plans coincide with nonattainment areas, then it is important to understand what impact this distinction has on redevelopment. Local government must balance air quality and economic redevelopment goals, especially cities that seek to attract new industry in their redevelopment mix.

Characterizing the Potential Correlation

Earlier chapters of this report sought to examine the potential correlation between air quality goals and brownfields redevelopment goals by discussing the situation in the three Pilot cities. It is clear that the Pilot cities have all developed “aggressive” brownfields redevelopment efforts as part of their urban economic redevelopment strategies. In addition, they all have been designated as nonattainment areas under clean air policy for some National Ambient Air Quality Standards (NAAQS). The Pilot cities, however, did not have identical redevelopment plans for replacing brownfields sites with new land use activities. One Pilot city actively seeks to attract new manufacturing industry in the redevelopment mix, while the other two Pilot cities seek non-polluting industry in their redevelopment plans.

Attempts to research the potential correlation between air quality goals and actual industry location choices involved a brief review of the literature and outreach to

the business community for information on location decision processes. The literature revealed that environmental policies (e.g., air quality, water quality, solid waste goals), are sometimes considered by the manufacturing industry, but the connection was vague. The scant evidence indicated that environmental requirements are not as important as traditional location factors. Efforts to survey the business community in two of the three Pilot city areas did not yield sufficient useful information to characterize the potential connection in question.

A series of five industry interviews, however, indicated that manufacturing businesses that are regulated as stationary sources and require emissions permits for new or modified physical plants routinely consider the extent of air regulation requirements when considering location choices. The requirements affect key concerns, such as plant design and cost, and permit approval times. The group of companies interviewed indicated that these considerations grow in importance when potential sites are located in nonattainment areas.

Each of the business representatives interviewed indicated that they factor in air quality requirements differently. Some companies devise normative analyses procedures; some find nonattainment status

as a threshold for acceptable size of plant based on pollution control economics; and some find that the nonattainment status for sites is an impediment that precludes expansion or siting of physical plants.

The Pilot city participant's discussion of brownfields redevelopment programs offered some insights concerning the role of air quality policies. Generally speaking, local governments do not specifically consider air quality regulations when developing and implementing brownfields redevelopment strategies. The local government participants generally agreed, though, that brownfields projects cost more to redevelop than a greenfield site because of clean-up requirements. When brownfields targeted for redevelopment coincide with air quality nonattainment areas, the added costs associated with industrial pollution control technology places an additional layer of cost to this class of land use redevelopment at a brownfield site. Yet, the exact nature of the interplay between brownfields redevelopment and air quality requirements remains elusive and not well understood.

Chapter Three identified a brownfield redevelopment case study where the site incorporated cleaner, energy-producing technology. This case provides some

indication that brownfields can be redeveloped and air quality can be improved simultaneously. Indeed, some of the approaches taken by the Pilot city are unique and innovative, and may serve as "best practices" for use by other cities. Yet, the conditions necessary for success may not be practical for many other cities.

Another brownfields redevelopment effort demonstrated how air quality requirements can become critical to a successful outcome. Failure was avoided in this case, due to the city's ability to obtain one-time off-sets through the donation of air credits from another company.

The potential for air quality policies to impact economic and brownfield redevelopment goals presents a challenge for local governments. It is generally agreed by the Pilot city participants that more information and dialogue concerning the potential impact of air quality policies on economic and brownfields redevelopment is desirable. The outcome of urban economic redevelopment efforts plays an important role in the quest to improve the human condition in urban centers. If air quality policy potentially acts as a deterrent to new or expanded business activity, then local governments face greater difficulty in improving the quality of life in the urban centers. There is concern among

local governments that unless cities designated as nonattainment can attract modern technology (i.e., energy efficient, lower emission technology), the urban population may suffer public health impacts from the continuation of poor air quality.

Pilot city participants mentioned concern about the potential for a downturn in the economy, and the consequential impediment stringent air quality requirements will pose to redevelopment. For example, if businesses choose the suburban and fringe development in attainment areas rather than urban centers that are nonattainment areas, then the local tax base may suffer, along with potential declines in employment and local/metropolitan multiplier effects. At the same time, local economic decline makes it more difficult for urban centers to generate a tax base and system of user charges that is sufficient to provide the capital necessary to improve infrastructure and usher in modern, less-polluting, technology that can significantly improve urban air quality. Overall, this process becomes cyclical.

Local governments have a legitimate interest in further clarifying the potential for air quality and redevelopment goals to yield conflicting results that are not in the best interest of their residents, businesses and institutions. There are two compelling

reasons for this interest. The first is that stringent air quality regulations that require costly pollution controls often results in a “gridlock” outcome where the business community relies on “grandfathered” permits in order to avoid the re-opening of their permits. Thus, the lack of progress in technology modernization leads to a continuation of the potential for poor air quality to adversely impact public health.

The second reason is that cities must attract a mix of land use activities to achieve the kind of redevelopment that incorporates an adequate tax base, employment growth and local multiplier effect and to further provide services and to finance the redevelopment and modernization of decaying urban infrastructure. Local governments need to take advantage of the dual benefits that derive from locating less polluting new technology in urban centers and consequentially generating a tax base that furthers their efforts to improve air quality and the general quality of life.

The remaining portions of this chapter identify and discuss areas where EPA, EDA, and other federal agencies can help local governments achieve clean air and redevelopment goals. These recommendations are based upon both the research conducted

as well as the discussion that has occurred over the past two years. The recommendations are distinguished from each other in this manner. These recommendations include action items that EPA and other federal agencies, states and local governments can pursue. Many of these areas warrant further research and intergovernmental dialogue to determine how to balance the simultaneous goals of clean air and economic development.

Clean Air Policy Issues Warranting Further Consideration

The Pilot city participants reached general agreement that further discussion is desirable concerning some aspects of clean air policy. The policy areas of most interest were the New Source Review (NSR) permit process, and issues related to air quality designation status, including requirements for stationary sources in nonattainment areas.

New Source Review:

A concern expressed by one of the Pilot cities was that the NSR permit process burdens industry with additional costs and uncertain project approval timelines. It therefore may have an effect on business decisions concerning expansion or location in

urban areas that are designated nonattainment. This situation, in conjunction with the costs involved in cleaning up brownfield sites, makes it potentially difficult to attract manufacturing industries to cities seeking to incorporate them in the redevelopment mix.

The effort to gauge the importance of air quality regulations as a location factor, and specifically with regard to brownfields, did not produce a strong case supporting the hypothesis that air policy impedes brownfields redevelopment.

Pilot city participants, however, have suggested through discussion that if the NSR process presents even a “surmountable impediment,” it still adds to the cost and uncertainty of urban economic development and perhaps brownfields redevelopment. The pilot participants generally agreed that if EPA could make some improvements to the NSR process, it could be helpful to urban economic development and brownfields redevelopment. To this extent, the most positive actions that EPA could take would be to: 1) streamline the NSR permitting process; 2) if appropriate, create a “one-stop” permit process that coordinates all air permit approvals into a single process or provides a single point of contact who is responsible within the agency;

3) conduct a pre-application meeting in which all relevant regulators and the applicant meet to go over the responsibilities of the applicant and identify any potential problems in advance; and 4) conduct some form of ongoing contact and follow up after permits are filed. It should be noted that EPA has been reviewing the NSR program since May 2001 to determine its impact on investment in new electricity generation and refinery capacity, energy efficiency, and environmental protection. EPA has conducted this review through an extensive series of meetings and written public comments. EPA anticipates completing its proposal for reforming the NSR program during 2002.

Emissions Trading Flexibility:

Like Chicago, other cities may seek new industry for infill projects. One of the attractions to new or expanded manufacturing businesses is availability of emissions off-sets that can be obtained and applied to new stationary source permits. The participating Pilot cities generally agreed that it would be helpful to be able to offer off-sets to modern, efficient technology as an inducement to locate on brownfields and other infill sites. Both emissions trading and regional emissions off-set banks were mentioned as desirable from the local government perspective.

Some of the participants suggested that emissions trading and banking programs would provide valuable redevelopment assistance if the cities had a greater ability to direct and target the trading process. For example, the cities could buy or take possession of off-sets from businesses that close down or curtail production units substantially below allowable emission levels. As another example, if cities were to take voluntary measures to reduce emissions, then some portion of the avoided emissions could be placed into a bank for trading purposes. Cities could avoid emissions by: infill versus greenfield development, investment in transit-oriented development, and imposition of local ordinances such as eliminating overnight engine running, clean-fuel fleet programs, etc.

The flexibility necessary to develop trading and banking programs requires an intergovernmental agreement. Currently, States usually control these programs, and State governments rely on emissions reductions to demonstrate improved air quality. The pilot cities recommended that local governments should be able to use all or a portion of the avoided emissions as off-sets for new and expanded redevelopment in brownfields areas.

An example of this type of flexibility is being demonstrated with a new pilot program, Project XL, in the Chicago metropolitan region. According to EPA, the Clean Air Act requires a new major source of emissions (such as a factory) which locates in a nonattainment area to purchase offsetting emissions. Offsetting emissions are credits created by another business that reduces its emissions. Currently, in the Chicago nonattainment area, a business must purchase 1.3 tons of offsets for each ton of emissions it will generate. Under Project XL, businesses which locate in specifically designated development zones will be given an alternative method of complying with the offset requirement. Chicago will create a “bank” of emission reduction credits through a variety of activities. Emission reductions will be quantified under a structure approved by the U.S. EPA and Illinois EPA. In addition to providing economic benefits for businesses, this project will help rejuvenate city neighborhoods and reduce sprawl, with its associated traffic and air pollution.

Additionally, Chicago will permanently retire 40% of the emission reductions produced for the project. The remaining 60% will be available for businesses that locate in specified development zones. This project is designed to deliver superior environmental

performance while allowing flexibility in satisfying regulatory “offset” requirements.

This particular project is integrating clean air and economic goals and is intended to encourage infill development, brownfield reuse, transit-oriented development, and other measures to advance economic development in existing communities. It is an ideal example.

Favor Energy Efficiency Set-Asides:

Some of the Pilot city participants identified as important the development of State Implementation Plans (SIPs) for the emerging NOx emissions budget —plans that are intended to provide relief from ozone nonattainment. Since the budget serves as a cornerstone in the effort to cap, trade and make progress toward reduced NOx emissions, it would be advantageous for local air quality and public health reasons to favor energy efficient sources over older technology that is more polluting. It was suggested that if the NOx budget could set aside some portion of the allowable NOx emissions for the modern, efficient combustion units, it would create some flexibility for business development in urban nonattainment areas.

A somewhat similar case was made for

combined heat and power (CHP) project proposals. Some participants indicated that “netting” for co-generation projects should be allowed. The advantage cited is the energy efficiency gains that off-set or avoid emissions related to heat, electricity and steam production.

Allow Emission Reduction Credits in SIPs when Local Government Adopts and Implements Sustainable Land Use Policies:

EPA is currently exploring regional air quality and its relationship with land use and transportation patterns in the context of sustainable cities. It is hypothesized that urban sprawl is a contributing factor to deteriorating air quality. As new development pushes out from urban centers to the fringe and suburban areas, it brings with it additional land use activities and traffic volume that increase pollutant emissions. These emissions may deteriorate the air quality in attainment areas, and can potentially crossover to nonattainment areas and hinder efforts to improve air quality.

The EPA has conducted a considerable amount of investigation into this phenomenon and has recently developed a model that is useful in assessing the air quality benefits of infill versus greenfield development. Infill

development, in the context of this report, is a proxy for urban redevelopment. In an EPA report entitled "Comparing Methodologies to Assess Transportation and Air Quality Impacts of Brownfields and Infill Development," EPA demonstrates a method to quantify the avoided air emissions from vehicular activity. The Agency recently issued national guidance on how states can adapt SIPs to allow credits toward attainment status if cities voluntarily adopt and implement sustainable land use policies, and if they quantify avoided emissions from infill development compared to greenfield development.

It was suggested by some Pilot city participants that the avoided emissions quantified according to the EPA method could be used to demonstrate further progress toward air improvement in nonattainment areas. Some of the Pilot city representatives suggested that if a city adopts and implements sustainable land use policies, and then quantifies avoided emissions from real projects, then the city should also be entitled to use the credits as off-sets to induce redevelopment. State air policy programs, however, may not want to, or may not be able to accommodate this situation. The participants generally agreed that it is an area where EPA can take the lead in an intergovernmental dialogue to create flexibility.

Progress in Achieving Air Quality Attainment Status:

Some of the Pilot city participants suggested that local government have a difficult task when they try to simultaneously improve air quality, achieve economic and brownfields redevelopment, and maintain the current industrial economic base. One of the difficulties stems from the rigidity of applying stringent emission standards on new technology when individual project economics are negative due to the cost of pollution controls. In this situation, as was discussed in Chapter Two, project proposals that would improve current plant emissions by 80 to 90 percent are still not enough to satisfy LAER and NSR permit requirements in some nonattainment areas.

This situation essentially rules out certain improvements that could have immediate and permanent emission reductions in a nonattainment area. It was suggested that this concern be raised at the state and federal level as an area for serious discussion. The pilot communities questioned the rational of imposing mandates to achieve "reasonable further progress," while demanding technology performance standards that are economically infeasible and rejecting a modern technology approach that would achieve an 80-90% reduction in current

emissions. There is some doubt that the implementation of the air quality policy creates the economic conditions necessary to allow for reasonable improvement. It was suggested that imposing "reasonable" emission reduction progress approaches could be beneficial and create a technology transition period. The current policy, it was suggested, has the effect of leading older, less efficient technology to maintain their "grandfathered" permit status, instead of opening up permits when minor modifications, or unit replacements are considered. There are good reasons not to change the current policy scheme, but they should be balanced with the fact that the current situation results in longer human exposure to and longer life of older, more polluting, industrial emitters. A discussion is needed to determine how this situation can be resolved.

EPA has issued new Ozone Flex Guidelines, which support state and local government efforts to make early, voluntary reductions in air emissions. These guidelines will help areas continue to attain the one-hour ozone standard and avoid nonattainment designation, while local controls are in effect to address air quality conditions. It is anticipated that the Ozone Flex Guidelines will encourage innovative efforts to reduce air

pollution that are cost-effective, flexible, and make sense for local areas.

Multi-jurisdictional Approaches and the Need for Continued Intergovernmental Dialogue

Cities have a long history of cooperating with national efforts to achieve improved air quality. Indeed, since stationary sources are local by definition, the city can and should play a critical role in achieving air quality goals. Local government, however, cannot single-handedly reverse the degradation of air quality for many reasons. For one, many cities suffer from trans-boundary air pollution generated from sources outside the city jurisdiction. The Pilot city participants generally agreed that EPA should continue its efforts to help local governments coordinate air quality planning with regional and state authorities. Some areas where multi-jurisdictional efforts could prove fruitful are discussed below.

Encouraging Regional Approaches to Economic Development and Improvement in Air Quality:

Since air pollution crosses established city, county and even state boundaries, regional

approaches are necessary to adequately address the issue of improving air quality. An example of regional cooperation can be found in the Chicago Metropolitan region. Chicago Mayor Richard M. Daley invited representatives from the 270 local governments that make up the greater Chicago Metropolitan area to form the Metropolitan Mayors Caucus. The purpose of the Caucus was to identify key issue areas that were of interest to the region and formulate potential solutions that could be worked on together. The group identified economic development and improving air quality as issue areas that deserved further dialogue and action.

The Metropolitan Mayors Caucus created a “Regional Dialogue on Clean Air and Redevelopment” report [?] with the Illinois Environmental Protection Agency and the U.S. Environmental Protection Agency. The purpose of the dialogue was to generate recommendations that would “reduce smog, strengthen the local economy, and enhance the region’s quality of life.” Over 300 individuals, representing industry, environmental and civic organizations, labor, government and academia, participated in the process. The Regional Dialogue classified their recommendations under seven categories including: Transportation;

Operations and Maintenance; Energy; Physical Development; Pollution Prevention; Trading Programs; and Government Action. The Caucus made a series of recommendations including: considering air quality impacts in siting decisions, promoting mass transit use, reducing energy consumption, reducing diesel emissions, designing developments to reduce emissions, and promoting pollution prevention techniques.

These recommendations and strategies were included in a “Clean Air Counts” Campaign that was launched in the Spring of 2000. The Campaign encompasses five separate campaigns to target businesses, institutions, households, and all levels of government. It is the hope of the Metropolitan Mayors Caucus that through this multifaceted and cooperative approach, air quality as well as economic development opportunities can be enhanced and improved.

The work of the Metropolitan Mayors Caucus and the Regional Dialogue can serve as a model for other communities throughout the nation. It should be noted that this model required resources to assist in its success. Resources may be needed to replicate this effort in other metropolitan regions.

Regional Growth and Transportation Planning:

The pilot cities also considered how potential air quality improvements and economic development opportunities could be enhanced through regionally-based comprehensive transportation plans. Despite progress made in reducing per-vehicle emissions through vehicle emission standards which in turn promoted the use of innovative technologies, mobile sources are increasingly becoming a dominant source of air pollution. The Pilot cities, as well as many other communities, estimate that one-third to one-half of their air pollution can now be attributed to mobile sources. The reasons for growth in the relative contribution of mobile emissions is explained by a number of factors, including: increased number of vehicles; increased number of vehicular trips; longer driving distances; and, longer commute times caused by road congestion, and relative decreases in stationary sources over the last two decades. Recently promulgated passenger vehicle and fuel standards and heavy duty vehicle and fuel standards will greatly reduce future per vehicle emissions. However, increases in vehicle miles traveled remain a concern.

Alternative transportation methods such as rail development, mass transit, bicycle lanes,

and pedestrian walkways were identified by the pilot cities as potentially producing air benefits. The Pilot cities agreed that further examination was needed to quantify the net air benefits of these types of alternative transportation methods. The results of these studies could provide important new information for regional transportation plans.

The pilot cities also discussed the importance of further examining other types of programs, policies and regional planning that may have clean air benefits. These include: requiring consistency between local land use plans and local and regional transportation plans; requiring adequate public facilities concurrent with development; establishing regional tax and expenditure policies that promote infill development; and encouraging city, county and regional balancing of job growth with housing development, priced and located to match the needs and incomes of the work force.

Although assistance and cooperation is needed by the State and Federal transportation agencies, EPA can play a continuing role in quantifying the avoided air emissions that result from implementing these programs and policies.

Brownfields Redevelopment Issues

Chapter Three outlined the reduced vehicular emissions that could be realized by redeveloping infill/brownfield sites as opposed to comparable greenfield sites. Redeveloping brownfields and other infill sites should be encouraged and supported. Although many programs and policies are in place to encourage brownfields redevelopment, there are many impediments to progress. According to the Conference of Mayors' report, entitled *Recycling America's Land: A National Report on Brownfields Redevelopment*, Volume III 2000, the redevelopment of brownfields is impeded by the lack of cleanup and assessment funds, as well as the need for changes in liability laws to protect innocent developers. The solutions that have been recommended include providing the necessary sums to cover cleanup costs, providing additional resources to conduct environmental assessments, and reforming liability provisions to protect innocent parties. Cities also identified the need for additional resources to encourage private sector investment through tax incentives and infrastructure improvements.

Although air quality concerns are very rarely incorporated into brownfield

redevelopment strategies, as indicated in Chapter Three, brownfields and other infill development projects may provide air quality benefits. In addition to the reduction in emissions from vehicles, it may be possible to redevelop brownfields with dual air quality benefits such as those discussed in the Chicago case study. The agencies that were responsible for brownfields and air quality, in each of the pilot cities, were brought together to discuss their individual goals and plans. By sharing this type of information, each realized the potential benefit of stronger collaboration between their agencies. The pilot cities suggested this type of dialogue and education is needed in more communities to better integrate brownfields redevelopment and air quality improvement plans.

Encouraging the Use of Alternative Fuel Vehicles and Cleaner Burning Diesels

In an effort to improve clean air quality, cities are also exploring their options in using cleaner-burning diesel and alternative fuels to power their municipal fleets. City officials realize that to encourage their citizens to explore cleaner fuel alternatives, fueling stations need to be convenient and readily available. Since former gas stations are

brownfield sites that are usually located near major roadways and are sometimes difficult to redevelop due to their small lot size, they may be ideally suited for future clean-fuel stations. The pilot cities would like to see this potential reuse further examined by EPA, DOE, as well as state governments.

The Pilot communities also discussed the benefits of enhancing the Department of Energy's Clean City Program. The Clean City Program is a voluntary, locally-based, government and industry partnership designed to expand the use of alternatives to gasoline and diesel fuel, accelerate the use of alternative fuel vehicles (AFVs), and build AFV refueling infrastructure. While the program has done a good job in providing assistance to over 70 local governments, there is a growing demand to enhance the program in participating communities as well as to expand the program to include other cities.

Options Available to Local Government for Improving Air Quality

Encouraging Mixed Use Zones:

Many local governments have long-established zoning policies based on segregating land use to mitigate public

nuisance issues. Sections of the city are classified as residential, commercial, industrial, institutional, or open space. By establishing these zones, cities can direct development to the appropriate areas. Typically, city planners designated these land uses so as not to conflict with one another and ultimately to protect the public's health, safety and welfare.

While these goals remain important, it may not be necessary to rigidly divide land use activities to achieve such goals. Much discussion by the Pilot cities focused on the potential air quality benefits that might be realized if mixed-use development was encouraged. Pilot city participants suggested that with mixed-use development, people would have more options to live closer to work or services, thereby potentially decreasing commuting times and providing an alternative to reliance on vehicles. Table 4-1 outlines some local mixed-use zoning initiatives that were discussed by the Pilot cities.

Creating Focused High Density/Transit-Oriented Development:

Many cities and counties have been examining the potential benefits of creating

higher density requirements in centrally-located or transit areas, as well as promoting cluster developments. By concentrating development in a particular area or around transit, a community may be able to encourage people to use alternative means to travel to their destinations. Table 4-2 outlines initiatives identified by the Pilot cities that local government should consider to encourage high density or transit-oriented development.

Creating Design Elements to Encourage Pedestrian, Bicycle, Transit and Ride-sharing

Activity:

The Pilot cities also discussed changing the design elements of neighborhoods to require inclusion of items such as pleasant and safe walkways, more extensive bike lanes, and providing incentives to encourage

carpooling. These changes would encourage people to choose non-polluting transportation options, as well as aesthetically improve brownfields and infill redevelopment projects. Some design elements, identified by the Pilot communities, are listed in Table 4-3.

Siting Clean Utilities on Brownfields

The Center for Clean Air Policy, in conjunction with this Pilot project, examined the benefits of siting clean utilities on brownfield sites. Many cities face, in addition to the challenge of improving air quality, the challenge of ensuring their residents and businesses a dependable power supply. Encouraging the siting of clean utilities on brownfield sites, the Pilot cities felt, may be one of the ways to help meet a city's energy needs as well as providing a productive use for an underutilized site. The Center for Clean Air Policy determined that siting clean utilities on brownfield sites does have clean air benefits since the new utilities are more efficient and less polluting than many current plants.

The Pilot cities would like to see the siting of gas-fired boilers on brownfields encouraged if grid emissions are off-set. The Pilot cities also support the building of Combined Heat and Power (CHP) plants on brownfield sites.

Table 4-1: Mixed-Use Zoning Approaches

- 1) Avoid prohibitive zoning and allowing more flexible mixed-use development.
- 2) Requiring mixed uses, with specified percentages of residential, public and commercial uses in target areas.
- 3) Using fine-grained zoning to achieve mixed use while insuring residential zones are buffered from heavy industrial zones with light industrial and commercial zones.
- 4) Using mixed use overlay zoning to add a second use to an area that is primarily in another use, (e.g., commercial corridors along major arterials in a primarily residential areas).
- 5) Granting incentives (e.g., reduced parking requirements, accelerated permit processing, infrastructure upgrades) for development that locates transit- or pedestrian-oriented amenities, like housing or child care, near commercial uses.
- 6) Adjusting development impact fee structures or giving tax breaks to encourage mixed use.

Suggested Areas for Further Research

While one of the major recommendations of this study is to urge EPA to continue with an intergovernmental dialogue on balancing clean air and economic redevelopment goals,

Table 4-2: High Density or Transit-Oriented Development Approaches

- 1) Increasing density or establishing minimum densities in central areas and around transit.
- 2) Measuring densities in square feet of land use per dwelling unit rather than minimum lot size to encourage cluster development.
- 3) Granting incentives (e.g., reduced parking requirements, accelerated permit processing, infrastructure upgrades) for development that focuses on existing urban areas and infill
- 4) Adjusting development impact fee structures or giving tax breaks to encourage infill and brownfields development.

there are other areas where continued research could prove valuable to local governments. These areas are briefly described below.

Review Major Stationary Source Permit Applications in Nonattainment and Attainment Areas:

One of the areas in this research that was lacking due to resource constraints was the examination of the relative importance of air quality goals in manufacturing location decisions, as compared to traditional location factors. A review of the literature and attempts to survey area business establishments did not yield robust results that provide findings that can be generalized. While the industry interviews were of some help in articulating the linkage between location decisions and air quality goals, there were far too few of them to serve as a basis for generalizing about location decisions.

One of the information items discussed by the Pilot city participants and EPA was that EPA estimates that they receive between two to three hundred major NSR applications, while states receive thousands of other applications that are considered minor sources. It may be useful to examine where these minor and major source applicants are

located. It would also be useful to see whether there is any data indicating that certain minor sources were located just beyond the boundaries of a non-attainment area that would have been major sources if located within the non-attainment area. This may possibly lead to further follow-up to

Table 4-3: Alternative Design Elements

- 1) Requiring bicycle lanes and transit stops on larger streets in new developments.
- 2) Requiring traffic calming devices in new developments.
- 3) Requiring lighting, signs, landscaping, etc. that is oriented towards pedestrians in target areas.
- 4) Reducing minimum parking requirements near transit hubs and for projects providing features that encourage pedestrian, bicycle, and transit activity.
- 5) Setting parking maximums in transit- and pedestrian-oriented areas.
- 6) Requiring preferential parking for carpools.

determine if those businesses took into account an area's attainment status prior to making a location decision. It may be helpful to local governments if an "audit" of these applications over the last five years in terms of their current (or final) disposition is done. Rather than merely speculating about the potential for a nonattainment designation to divert new or expanded plant capacity to attainment areas, EPA can review the applications and their ultimate disposition.

This type of review can be coupled with a similar audit conducted on the applications submitted each year for major stationary sources in attainment areas. By looking at source permit applications in both areas, it

should be relatively more productive in generating useful information compared to the process employed by this study.

Quantifying Clean Air Benefits from Local Government Policies:

EPA's effort to develop a method to quantify the clean air benefits from infill versus greenfield development was briefly discussed in Chapter Four. This method has the potential to provide a critical tool for local governments in assessing the effectiveness of their local land use policies in achieving economic redevelopment goals and avoiding unnecessary emissions increments to the local air shed.

The Conference of Mayors supports continued work in this area by EPA. It should be noted that local governments should be made aware that this method exists. EPA also should make an effort to demonstrate to local governments how this tool can be applied in practice. Lastly, EPA should help local governments not only take credit for avoided emissions in nonattainment areas, but also define how the avoided emissions (or some portion of them) can be used by cities to provide offsets for industrial sources seeking to locate in brownfields or other urban redevelopment areas.

Appendix

Survey Instrument

If you have recently expanded, opened or relocated a facility, please describe that process by answering the questions in this survey. Otherwise, use your last site selection process as the basis for answering these questions.

1. Whom can we call with specific clarifying questions?

Contact Name: _____

Company Name: _____

Position: _____

Phone number: _____

Type of industry: _____

2. Original facility was in:

Baltimore _____

Chicago _____

Dallas _____

Other _____

No original facility _____

3. New facility is in:

Baltimore _____

Chicago _____

Dallas _____

Other _____

Not new but an expansion _____

4. Year of site selection: _____

5. Did you consider?

a) inner city locations: Yes: _____ No: _____

b) suburban locations: Yes: _____ No: _____

c) rural locations: Yes: _____ No: _____

6. How important were the following factors in choosing among alternative sites? Rank each factor as of H (high), M (medium), or L (low) importance in your decision. If a factor was not relevant, please leave it blank.

___ access to markets/customers

___ access to or the skill level of labor

___ cost of labor

___ land prices or previous ownership of the land

___ state and local tax rates (base rates before any incentives)

___ tax breaks, enterprise zones, or other economic development incentives

___ utility costs

___ availability of public transportation

___ access to inter-city transportation (rail, airport, shipping, highways, etc)

___ proximity to suppliers or other parts of your own company

___ infrastructure on site

___ local or regional amenities (climate, schools, cultural attractions)

___ quality of local environment (e.g., clean air, water, etc.)

___ stringency or complexity of environmental regulations or concerns

___ stringency or complexity of other governmental regulations

___ other (please specify): _____

7. If, in the previous question, you ranked environmental regulations or concerns of High or Medium importance in your decision of where to locate or whether to expand at your existing site, please rank the specific regulations or concerns below. Please rank them as being of H (high), M (medium), or L (low) importance to your decision.

- air quality
 - water quality
 - solid waste disposal
 - hazardous waste treatment and disposal
 - occupational safety/health
 - concern expressed by local citizens
 - other (please specify):
-

8. Have you considered or are you now considering locating or expanding on a Abrownfield@ site, a site where there is perceived or real environmental contamination?

Yes: No:

9. If Ayes,@ please rank the importance of the factors listed below in determining whether to locate or expand on a Abrownfield@ site. Again, H (high), M (medium), or L (low) importance. Please rank every factor.

- Low cost of land
- Economic incentives
- Extent of site contamination
- Likelihood of future cleanup liability
- Urban location
- Quality of existing infrastructure

Designation status of air as healthful (Aattainment@) or unhealthy (Anonattainment@)

Other (please specify):

10. If an area's air quality designation status (Aattainment@ or Anonattainment@) was important in your decision on where to locate or whether to expand at your current location, is your expansion project or new facility considered a major source?

Yes: No: Do not know:

11. How did the factors listed below affect your decision to relocate? Please rank using the same H (high), M (medium), L (low) scale.

- Permitting time
 - Permitting cost
 - Complexity of regulations
 - Costs of control
 - Availability of offsets (check here: , if you are unfamiliar with the term Aoffsets@)
 - Costs of offsets
 - Other (please specify):
-

12. Please fax or mail your completed survey to the following address:

The U.S. Conference of Mayors
Attn: Judy Sheahan
1620 Eye Street, NW
Washington, DC 20006
202-293-7330 phone/ 202-429-0422



The United States Conference of Mayors

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