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Interstate 75 Focus Area Study Health Impact Assessment December, 2010



Cincinnati Museum Center, Queensgate Neighborhood, Dr. Mohammad Alam, 2010



Typical Scene, Avondale Neighborhood, Cincinnati Health Department, 2010 Mitchell Avenue Interchange, Spring Grove Village and Avondale Neighborhoods, Cincinnati Area Geographic Information System, 2010 (CAGIS does not assume any legal responsibilities for the information contained in this map.)



Mitchell Avenue Interchange, Spring Grove Village and Avondale Neighborhoods, Cincinnati Area Geographic Information System, 2010 (CAGIS does not assume any legal responsibilities for the information contained in this map.)

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Introduction

I-75 Focus Area Study Purpose

Interstate 75 (I-75) is a major north-south transportation corridor that bisects the City of Cincinnati. Infrastructure improvements to I-75 by the Ohio Department of Transportation (ODOT) have been planned and include adding one lane in both directions of the interstate and the replacement of the Brent Spence Bridge. The City of Cincinnati became more actively engaged in the future of this corridor by developing a comprehensive plan for selected neighborhoods adjacent to I-75. The study makes recommendations for economic development and redevelopment, neighborhood investment, green initiatives, transportation infrastructure and transportation modes and urban design. Urban Design Associates (UDA) of Pittsburgh, PA was chosen by the City of Cincinnati to produce the final plan recommendations. The plan became known as Revive Cincinnati: Neighborhoods of the Mill Creek Valley and the four focus areas are adjacent to the interstate and they are Mitchell Avenue Interchange, South Cumminsville / Northside Interchange, Hopple Street Interchange and Queensgate /Central Business District.

Purpose of an HIA and the HIA Process

The purpose of this assessment is to review the final recommendations of the Revive Cincinnati: Neighborhoods of the Mill Creek Valley for health impacts to adjacent neighborhood residents. According to the Centers for Disease Control (CDC) the Health Impact Assessment (HIA) is used “to evaluate objectively the potential health effects of a project or policy before it is built or implemented. HIA can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. The HIA framework is used to bring potential public health impacts and considerations to the decision-making process for plans, projects, and policies that fall outside of traditional public health arenas, such as transportation and land use.” (Center of Disease Control and Prevention)

Although similar to an Environmental Impact Assessment, according to the CDC the HIA differs in that it has a focus on health outcomes “such as obesity, physical inactivity, asthma, injuries, and social equity.” The HIA follows six steps: (1) screening - identify projects or policies for which an HIA would be useful, (2) scoping - identify which health effects to consider, (3) assessment of risks and benefits, (4) developing recommendations, (5) reporting -present the results to decision-makers, and (6) evaluation - determine the affect of the HIA on the decision.

Description of the 3 Neighborhoods: Avondale, Spring Grove Village, and Queensgate

During the screening process of the HIA it was determined that due to time constraints only two focus areas could be studied for the final consultant plan recommendations and adoption after 5/31/2010. The HIA Committee determined that the study priority should be given to empowerment zone neighborhoods because these neighborhoods represent the most vulnerable populations in the City and also have limited opportunities to impact public decision-making. The assessment boundaries would include the neighborhoods adjacent to the Mitchell Avenue Interchange including Avondale, Spring Grove Village and the Queensgate area. Avondale and Queensgate are Empowerment Zone neighborhoods. Spring Grove Village is not considered as an empowerment zone; however, it was included in this study due to earlier concerns expressed by neighborhood representatives about air quality impacts on asthma and other respiratory disease. Spring Grove Village is bounded by chemical producing corporations and the Gray Road and Elda landfills. Both landfills are now closed.

Neighborhood Profiles

Avondale

Located in the heart of Cincinnati, Avondale (Census Tract Numbers 34, 66, 67, 68, 69) was annexed to the City of Cincinnati in 1896. Avondale was originally populated in the mid 1800's by wealthy merchants and manufacturers who built spacious homes on large tracts of land. This explains the existence of large, historic homes in Avondale. Less affluent Greek Americans and Eastern Europeans also settled in Avondale in the early twentieth century. After World War II many residents left Avondale to buy modern homes in the suburbs which started the subdivision of the large homes into low-rent apartments. African-American residents relocated to the Avondale neighborhood to escape the poor living conditions of the city center. The African-Americans created a thriving community.

Avondale is remembered for the uprising on April 8, 1968, of neighborhood residents five days after the assassination of reverend Dr. Martin Luther King, Jr. This uprising was touched off by an accidental shooting that resulted in rumor that a white policeman had shot a Black woman.

Avondale houses many notable institutions including the Cincinnati Zoo and Botanical Gardens, Children's Hospital, the Cincinnati Health Department, and the University of Cincinnati Medical Center. Avondale is conveniently located to Interstate 75 and the Central Business District. Currently Avondale is experiencing revitalization of the Burnet Avenue corridor that will result in institution expansion and building development that will be a mix of retail, offices and residences (\$100 million). Avondale also has two new elementary schools: Rockdale Academy (\$14 million) and South Avondale (\$15 million) (Cincinnati Public Schools).

Avondale is a relatively large neighborhood with a population of 17,393 and 7,175 households (Social Compact, Inc., 2007). The community is 91.7% African American. In spite of the recent investment in Avondale, 40.3 percent of the household population had income below the poverty level (2000) with a median household income of \$17,183 (Social Compact, Inc., 2007). In 1990, 45.9 of persons 25 and older had never graduated from high school. Avondale has low owner occupancy at 22.5%. Conversely 77.5% of the occupied units were rented (Social Compact, Inc., 2007).

Since the Aldi's grocery store closed in 2008, the neighborhood is left with no full service grocer. Avondale residents do not have close access to fresh food. In addition, Avondale does not have a farmers' market to supplement the grocery store loss. However, there remains easy access to fast food businesses e.g. Burger King, Kentucky Fried Chicken, and White Castle along the main north-south corridor of Reading Road.

According to the Social Compact's 2007 Cincinnati Market Neighborhood Drill Down Report opportunities exist to develop new businesses to serve underserved markets in Avondale. There are an estimated 8,828 employees in the neighborhood with the spending potential of \$26.1 million. The lack of a full service grocer results in a leakage of \$16.1 million from the neighborhood. Also, underserved retail, apparel, and restaurant demand results in a total estimated leakage of \$34.1 million.

20.7% of births to Avondale residents were preterm with 3.5% very preterm. The mean maternal age was 22-24.8 years and the percentage of births to single moms was 63.2%-95% (Children's Hospital Child Policy Research Center, 1996-2004).



Aerial View of Mitchell Avenue Interchange and Adjacent Neighborhoods
Cincinnati Area Geographic Information System, 5/2010 (CAGIS does not assume any legal responsibilities for the information contained in this map. Users noting errors or omissions are encouraged to contact the CAGIS 513-352-1656.)

Spring Grove Village

Spring Grove Village (Census Tract Number 73) was originally known as Winton Place but in 2007 the residents changed its name to Spring Grove Village to honor the history and character of the neighborhood. Historically known as both The Mill Creek Township Farm and Spring Grove, this canal and railroad town was incorporated in 1882 and annexed to the City of Cincinnati in 1903. Two elementary Schools (Winton Montessori and the Winton Hills Academy) are located in the neighborhood. Harmony Lodge, also in Spring Grove Village, is known for showcasing barbershop quartets. Spring Grove Village is perhaps best known today for the nationally recognized Spring Grove Cemetery and Arboretum.

Spring Grove Village has a population of 3,339 and 1,381 households in 2007. Also, in 2007 the median household income was \$34,204. Owner occupied buildings is 83% (Social Compact, Inc., 2007).

In 2007, there were 3,521 employees working in Spring Grove Village with a spending potential of \$10.4 million (Social Compact, Inc., 2007). There are three grocers in the neighborhood and one full service grocery store. In addition, Spring Grove Village is in close proximity to the farmers' market in the Northside community.

21.7% of births to Spring Grove Village residents were preterm and 2.2% were very preterm. The mean maternal age was 22-24.8 years and the percentage of births to single moms was 37.5-63.1% (Children's Hospital Child Policy Research Center, 1996-2004).

Queensgate

The Queensgate area (Census Tract Number 1) is located adjacent to Interstate 75 and the west of downtown Cincinnati. This area is a commercial hub and has been so since the 1800's. Queensgate has successfully attracted manufacturing and large scale slaughtering/meat packing businesses to the area due to an easy access to the Millcreek, railroads and the Ohio River. The CSX Rail Yard is a major hub and borders Queensgate on the West.



Rail Yard, Looking South into Queensgate, Cincinnati Health Department

The GO Cincinnati Plan has recommended that Queensgate be designated an eco-industrial research and industrial park with a restored Millcreek corridor. This recommendation is echoed by the

Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study with the additional recommendation of more commercial retail space around the Cincinnati Museum Center and then creating connections from Queensgate to Downtown Cincinnati by utilizing transportation and landscaped boulevards.

According to the Social Compact's 2007 Cincinnati Market Neighborhood Drill Down Report, Queensgate has a population of 758 with a total of 55 households. The median household income is \$27,857. Home ownership is 7.3%.

Queensgate has a total of 372 businesses and 7,045 employees. This area generates \$1.7B revenues (Social Compact, Inc., 2007). There is little to no retail leakage with the exception for full service grocers. There are no full service grocers in Queensgate and the leakage for grocers is \$.2 million (Social Compact, Inc., 2007). Findlay Market is the closest farmers' market and is open year round.

36.8% of births to Queensgate residents were preterm and 5.3% were very preterm. The mean maternal age was 22-24.8 years and the percentage of births to single moms was 63.2-95% (Children's Hospital Child Policy Research Center, 1996-2004).



Queensgate, Looking North at the Historic Longworth Hall and On Ramp to the Brent Spence Bridge, Cincinnati Health Department

Socio Economic Data (Source: 2000 U.S. Census, U.S. Census Updates, or Social Compact's 2007 Cincinnati Neighborhood Market Drill Down, Catalyzing Business Investment in Inner City Neighborhoods Report)

Local Farmer's Markets (Source: Nutrition Council of Greater Cincinnati, 6/09)



Map of Queensgate and Adjacent Neighborhoods
Cincinnati Area Geographic Information System, 5/2010 (CAGIS does not assume any legal responsibilities for the information contained in this map. Users noting errors or omissions are encouraged to contact the CAGIS 513-352-1656.)

Description of Impacts Studied: Air Quality, Traffic/Crashes/Air Quality, Displacement and Recommendations

Air Quality

One northbound and one southbound lane will be added to Interstate 75 increasing the capacity of the Interstate to eight lanes. After the construction is completed, I-75 will have eight uninterrupted lanes that will connect from Dayton, Ohio south to Cincinnati and the Ohio River. Construction of the Mitchell Avenue Interchange improvement and lane additions is scheduled to begin March, 2011 and completed in August 2014. The Mitchell Avenue Interchange is a focus area in the revitalization plan and a focus area of this HIA.



I-75 Mitchell Avenue Interchange Looking West 4/2010, Cincinnati Health Department

The demolition and construction activities related to the Interstate lanes addition may result in a disturbance of the air quality for the adjacent neighborhoods of Avondale and Spring Grove Village. Prevailing winds in Cincinnati move from the Southwest to Northeast. Since Avondale lies to the east of Interstate 75 the air quality disturbance from demolition and construction activities may have a greater significance for residents and employees in Avondale.

The Brent Spence Bridge, which spans the Ohio River, is also scheduled to be replaced by a new bridge. Its construction will start in 2015. Demolition and construction of the bridge may impact air quality in Queensgate and the Central Business District (CBD) of Cincinnati where a combined 72,000 employees work. Queensgate is also a focus area of this HIA. Due to the prevailing wind pattern in Cincinnati, Queensgate community which is located to the west of the construction area may experience lesser air quality disturbance than all other neighborhoods northeast of the Bridge.

The HIA Committee suggests that a baseline air quality level should be established prior to the commencement of construction, followed by the determination of air quality during the construction. It is not known how the addition of north and southbound lanes will impact long term air quality of the neighborhood after the construction is completed. The HIA Committee recommends the collection of data on post-construction air quality due to the impact of increased traffic capacity and improved efficiency in the system. This information will be useful to future interstate highway improvement projects and HIA studies.

The U.S. EPA has listed six “criteria pollutants” that have potential impact on human health. The six pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide and particulate matter. This HIA Committee recommends narrowing the study focus on Particulate Matter 2.5 (PM 2.5) and Volatile Organic Compounds (VOC’s) because of the nature of the demolition, crushing, and transportation of materials that will be required for the lane additions and bridge replacement. Demolition and crushing activities will create large and small particulate matter, however, the small particulate matter, PM 2.5, is of concern because the easily inhaled particles have an adverse effect on cardio-pulmonary diseases and trigger asthma. The addition of vehicles to transport workers, debris, and construction materials will likely increase VOC emissions. VOC’s also have an adverse effect on cardio pulmonary diseases and some of the compounds are suspected to cause cancer. According to the United States Environmental Protection Agency, in 2005 on road vehicles are the second largest source of VOC’s in Ohio. (EPA, 2005)

Faculty and students at the Center for Health Related Aerosol Studies and Industrial Hygiene at the University of Cincinnati will take the lead and collaborate with the Cincinnati Health Department staff to design a methodology for measuring the air quality pre-, during, and post-construction phases. They will also take into account seasonal and spatial variations in their studies. The establishment of baseline air quality levels began in July, 2010. It is anticipated that the pre-, during and post-study data will be a part of the joint CHD and UC faculty publication. It will also serve as a basis for evaluation of the following HIA recommendations. It is hoped that HIA evaluation, to be conducted in 2014, when the Mitchell Interchange is complete, will be included in the National Association of County and City Health Officials, and Center for Disease Control HIA archives for future reference. (Source: Discussions with the University of Cincinnati’s Center for Health Related Aerosol Studies; City of Cincinnati’s Department of Transportation Engineering; and Hamilton County Department of Environmental Services’ Air Quality Management Division)

Air Quality Recommendations

- a. Promote Landscaping and Greenspace in the plan. This will help both directly and indirectly in lowering the risk factors associated with inactivity, including cardiovascular disease, diabetes, obesity and osteoporosis and also the mental well-being of the residents (Public Health Seattle & King County, 2008). Landscaping and Greenspace also helps in lowering the urban heat levels and provide filters for air contaminants. Therefore, the I-75 Focus Area HIA recognizes and supports the Revive I-75 Plan recommendations to restore the Millcreek to its natural state and install bicycle and walking paths along with the creation of green spaces.
- b. Support the efforts of the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study to restore the Millcreek to its natural state etc. by forming a partnership with the Millcreek Restoration Project by working with the Planning Department and Transportation Divisions and through support letters to City Council when roadway changes are made in the neighborhood.
- c. Support the features of the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study which provide alternatives to vehicle transportation by working with the Planning and Transportation Divisions and through support letters to City Council when roadway changes are made in the neighborhood.
- d. Maximize green space in the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study final document.

- e. Utilize plants and trees that produce a low level of allergens. Some landscaping plants may cause allergic reactions and asthma in sensitive individuals (e.g. Dogwood, goldenrod, ragweed) while others may be beautiful but poisonous (e.g. nightshade). See the Appendix for a reference list of Ohio native hypoallergenic plant species.
- f. Monitor air quality at schools, day care centers and senior housing during and after construction. If harmful levels of air pollution are found, alert the Hamilton County Department of Environmental Services, Air Quality Division to work with the construction company to mitigate air quality.

Traffic/Crashes/Air Quality

Traffic patterns, crashes, and air quality related to stopping and starting may change during Interstate 75 lane construction and bridge replacement. At this time the Ohio Department of Transportation does not anticipate closing the interstate for construction. There may be recommended detours, however, those will be confined to arterial streets and away from residential neighborhood streets. Avondale and Spring Grove Village are primarily residential neighborhoods. At this time, there is no modeling to base ideas for detours that individual drivers may take to avoid construction. Daily commuters may seek alternative routes to avoid construction and the impact of these individual decisions is not known. There is also concern that travelers on I-75 that are planning to drive through the city, and are not familiar with Cincinnati, may need additional signage with clear messages directing them to detour routes when necessary to avoid crashes and traffic congestion.

(Source: Discussions with Traffic Engineering, City of Cincinnati)

Traffic/Crashes/ Air Quality Recommendations

- a. The I-75 Focus Area HIA supports Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study recommendations to create connectivity across the barriers such as I-75, large arterial streets, and the Mill Creek.
- b. Create safe, efficient ways to connect neighborhoods to businesses and public services.
- c. Create walkable streets. Walkable streets include the following factors:
 - sidewalks have room for two people to walk side by side and should be at least 5 feet wide and 8-12 feet in commercial areas. Sidewalks should not be immediately adjacent to the street.
 - City sidewalks should be available everywhere and are kept in good condition.
 - Intersections should have clearly marked crosswalks and walk/don't walk signals.
 - Install traffic calming devices so that pedestrians feel safe.



Spring Grove Avenue at Mitchell Avenue Looking North, Cincinnati Health Department

d. Promote safe neighborhood streets. Safe street characteristics include:

- Bright street lights.
- Litter free environment.
- Streets with well maintained yards and clean sidewalks.
- Kids playing outside.

(Source: Columbus Public Health)

Displacement

Some residents will be displaced as a result of the Interstate Highway improvements. The Ohio Department of Transportation is already involved with acquiring properties. Although the City of Cincinnati has seen a turn-around in population loss in the last 10 years (Social Compact, Inc., 2007) it is important to retain current residents and encourage families that will be displaced to relocate inside of their neighborhood and if that is not possible, to relocate within the City of Cincinnati. Suggested incentives for the displaced families to stay in the city are recommended below.

Displacement Recommendations

- a. Assist displaced residents to find Leadership in Energy and Environmental Design (LEED) certified housing and lead abated housing options for purchase or rent within the City of Cincinnati. (Sources: City Planning, Economic Development, City Relocation Office)
- b. Provide low-interest; no down payment loans to purchase LEED certified housing in the City of Cincinnati to those displaced families who are interested.
- c. Minimize business loss due to relocation and minimize obstacles to business access during construction.
- d. Minimize the mental health impact of loss of community and relocation through mental health services.
- e. Utilize programs that can keep those families that are interested in being connected as a group through meetings, recreation, etc. because moving is particularly difficult for children.
- f. Minimize the loss of revenue in Spring Grove Village, Avondale, and the City of Cincinnati.
- g. Minimize the loss of jobs to the residents of Spring Grove Village, Avondale, and the City of Cincinnati.
- h. Assure access to local food, transportation and health care services to the displaced families.

Construction Recommendations

Pre-Construction Period Recommendations

Particulate matter 2.5 (PM_{2.5}), and Volatile Organic Compounds (VOC's) have adverse effects on cardio pulmonary patients. The upcoming Interstate-75 construction and proposed Focus Area Development may cause a disturbance to the air quality due to demolition and construction activities from crushers, transportation of debris, muddy tires, and dust on the roadway. Traffic delays and traffic rerouting may also factor into air quality changes. Hence the I-75 Focus Area HIA recommends that a baseline air quality study be conducted where the Center for Health Related Aerosol Studies at the University of Cincinnati will work in partnership to design a method of data collection, methodology for analysis to determine a base line level of PM_{2.5} and VOC's.

The Cincinnati Health Department will collaborate with the University of Cincinnati faculty and staff on the final methodology that will include details of the location of air monitoring equipment. This baseline will be used as a seasonal comparison of PM_{2.5} and VOC's for the duration of the I-75 improvements as a monitor, and after the project is completed. For the future, knowledge about the

effects of interstate roadway improvements, e.g., lane additions, bridge construction, and interchange reconfiguration. The post construction air quality measurements would be sent to the Centers for Disease Control (CDC) and the National Association of County and City Health Officials (NACCHO) media libraries. This information will be available for other local jurisdictions that may decide to write major highway construction HIA's.

Construction Contracts – HIA recommendations should be written into the construction contracts, such as the air quality data the contractor will pay to collect, how to collect the data and how the contractor will make the data available to the public, should be written into the contract. The contract should list how dirt tire tracks, crushers, noise, debris disposal and recycling, dust control, lead control and asbestos will be handled and controlled to minimize environmental and health impacts. The contract should strictly prohibit open burning at the construction site or within the City of Cincinnati. Construction contracts should include sections that all Occupation, Safety and Health Administration (OSHA), Environmental Protection Agency, and National Ambient Air Quality standards will be followed during construction and clean up. If the contractor is required to obtain air permits then they should strictly adhere to the permit conditions.

Community Education Program – This program will inform residents about rights to lodge a complaint about noise, air quality, bad odors, and dirt on the road, etc. This program should inform residents of the City of Cincinnati complaints hotline (513-591-6000) and Hamilton County complaint hotline (513-946-7777) numbers to voice concerns. Public service announcements, press releases, and pamphlets included in water or electrical bills should be included in the outreach. The contractor should set aside funds for the administration of this program by the City of Cincinnati and Hamilton County.

Housing Program - Moving is the 4th major source of stress for American families. The effects of forced relocation can have considerable negative impact on mental health and well being. According to Dr. Mindy Fullilove, people who have been displaced experience "root shock." Root shock is the traumatic stress reaction to the loss of some of one's entire emotional ecosystem. Root shock can follow development forced displacement.

Hence, the I-75 Focus Area HIA recommends the relocation of displaced residents should be to affordable, LEED certified housing in the City of Cincinnati, preferably in their present neighborhood. The HIA recommends to relocate displaced families as close to their present neighborhoods as possible through the development of infill housing or by rehabbing buildings in the neighborhood to LEED standards.

Studies have found that when people move out of their neighborhoods they tend to use cars more and walk less which impacts cardiovascular health and obesity. The City of Cincinnati should provide low interest; no down payment loans to purchase LEED certified housing in the City of Cincinnati to those families who are interested.

Construction Period Recommendations

Detour and alternate routes are a safety issue and, when appropriate, directions due to construction needs need to be provided to the public by providing real time traffic and road construction information in an easily accessible way to help area residents, transit, freight, Emergency Medical Services, and other users can change routes and travel times as needed (Public Health Seattle & King County, 2008).

The Cincinnati Museum Center has requested that they are provided with construction schedules and route detours well in advance so that the Museum Center can prepare signs and mailings with the re-routing information for Museum Center patrons.

During construction, appropriate directions should be given to the public in the event there is a detour. AM radio broadcasts should include detour information to assist residents. ARTEMIS notification of detour information will assist travelers on I-75.

In Spring Grove Village, the lighting in should be maintained and bright during construction. Maintain pedestrian access to business east and west of Interstate 75, at the Mitchell Avenue Interchange, during construction. For many residents there is no other alternative to access grocery stores and other commercial establishments and services. Clifton Avenue should be monitored during construction for traffic congestion. Police should direct traffic when traffic is congested at Clifton and Kenard Avenues and Clifton and Spring Grove Avenues.

- a. Develop safe and clearly marked alternative routes for pedestrians and bicyclists during the construction period (Public Health Seattle & King County, 2008).
- b. Direct alternate or detour routes away from high pedestrian areas and schools and churches to decrease likelihood of vehicle-related pedestrian injury.
- c. Provide clearly identified temporary lane configuration to maintain traffic flow in the corridor (Public Health Seattle & King County, 2008).
- d. Provide access to construction schedules so Emergency Medical Services can provide uninterrupted service in the corridor, especially where access is limited (Public Health Seattle & King County, 2008).
- e. Schedule construction activities that can delay traffic during the lowest traffic periods to minimize congestion (Public Health Seattle & King County, 2008).
- f. Construction related noise health effects include annoyance, stress and stress related health effects, sleep disturbances, and mental fatigue (Public Health Seattle & King County, 2008). Therefore, maintain construction equipment in good working condition so that it does not create additional noise. Use approved noise control devices for generators, compressors, and similar equipment. Limit the operating periods for equipment that produces loud noise, such as pile drivers and concrete cutters, particularly during nighttime periods.
- g. Maintain access to key neighborhood services such as grocery stores, hospitals, gas stations, Laundromats, post offices and schools.
- h. Construction contracts should require minute by minute construction and traffic forecasts sent to Channels 5, 9, 12, and 19 to tweet construction updates.

Post Construction Period Recommendations

- a. Install traffic calming devices, such as traffic circles, curb bulbs, and speed humps, and limit construction traffic routes in the affected neighborhoods (Public Health Seattle & King County, 2008).
- b. Monitor and finalize the air quality study and report on the air quality impact of the construction of interstate highway lanes.

Conclusion

The Urban Design Associates (UDA) recommendations for the I-75 Focus Area Study (also known as Revive Cincinnati: Neighborhoods of the Mill Creek Valley) have a number of recommendations that will have positive impacts for air quality and population health and are also recommended as part of this

HIA. It is believed that these recommendations will improve air quality by encouraging walking, biking, and the use of public transit.

Improving traffic flow and reducing vehicle congestion will also have positive outcome on air quality. Additionally, networking existing green space and designing new green spaces and the use of landscaping will make the area more attractive: thus creating a destination for walkers and bikers. A summary of the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study recommendations in the area of the Mitchell Interchange which includes the neighborhoods of Spring Grove Village and Avondale include:

1. Link existing cemeteries, parks and trails to create a connected green space.
2. Naturalize the Mill Creek through the removal of channel walls and the creation of natural flood planes to enhance water quality issues and advance Metropolitan Sewer District storm water drainage solutions.
3. Create a multi-use trail and park space along the Mill Creek and link it to existing trail and park network from the Mill Creek to Lower Price Hill, the Banks, and points east and west along the Ohio River.
4. Preserve potential alignments for future passenger rail.
5. Study traffic and street design for Mitchell Avenue and Vine Street to determine the best solution for traffic flow.
6. Enhance connectivity across the Mill Creek with the addition of pedestrian bridges.

For the Queensgate focus area, the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study recommends enhanced intermodal transportation transfer points to make bus, transit, and rail a better transportation option. The plan recommends naturalizing the Mill Creek in this area, and along with the other four focus areas, the plan envisions a connected trail and park network along the Mill Creek to Lower Price Hill, the Banks, and points east and west along the Ohio River.

Improving the connectivity of the street network east and west of I-75 will promote walking and biking and reduce the sense of isolation in Queensgate. The Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study also recommends reconnecting the street grid to engage West End residents to utilize recreation and retail opportunities west of I-75. This goes along with the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study visioning an enhanced Museum Center district where new shops and additional cultural amenities will line the Museum Center plaza.

A heat island is an urban area having higher average temperature than its surroundings due to greater absorption, retention, and generation of heat by its buildings, and pavements. The Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study also shows boulevards on Linn Street, Ezzard Charles, Sixth Street and other major streets which will create a pleasant roadway system that has street trees and will reduce the heat island effect of the pavement.

It is critical that the recommendations of this HIA become an integral part of the I-75 Focus Area revitalization. The recommendations of this study, to study air quality pre, during and post construction, will provide valuable information that can be utilized to reduce adverse air quality impacts for this and future projects. Modifying construction contracts with air quality in mind will make a better environment during construction for residents, employees, and construction workers. We feel that maximizing and linking green space and making the street network more inviting to walkers and cyclists will create more opportunities for citizens and visitors to do just that. Walking and biking more frequently will improve their personal health and well being. These recommendations are critical for a healthy community.

For the future it is recommended that additional geographical areas and further built environment/health impacts of the Revive I-75 Plan should be assessed. For the future, consider to include the two Focus Areas that were not included in this study: Northside/ South Cumminsville and

Camp Washington. A number of the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study recommendations carry forward to these two neighborhoods such as recommendations for the Mill Creek naturalization, and connectivity across I-75. The four focus areas are similar, and face many of the same issues. Therefore many of the recommendations made in this HIA would also apply to Northside/South Cumminsville and Camp Washington.

In the revitalization plan, the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study made a number of recommendations in the area of Public Transportation, Urban Design, Water Quality, Jobs and Economic Development. These aspects of the plan were not assessed in this HIA and should be the subject of a future study.

The HIA Committee will follow up with the Planning Department as the implementation of the Revive Cincinnati: Neighborhoods of the Mill Creek Valley Study moves forward. This I-75 Focus Area HIA allows the Committee to advocate from the health perspective for a healthier community for our residents.

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I-75 Focus Area Study HIA

Maps:

Mitchell Avenue Interchange and Adjacent Neighborhoods
Queensgate and Adjacent Neighborhoods

Selected Ohio Native Plants for Landscape and Restoration Use that are Hypoallergenic

The following Ohio native plant species included for reference purposes. The following plant species have been rated by Thomas Ogren, the author of Allergy-Free Gardening: the Revolutionary Guide to Healthy Landscaping. Thomas Ogren rates these plants on a scale of 1 to 10 in terms of allergy potential with 1 being best and 10 being worst.

Upland Woods Species

Plant Type

Deciduous-Shrub

- Scientific Name: *Hydrangea arborescens*
Common Name: Wild hydrangea

Hydrangea (Rate 3): Its leaves contain a natural sweetness. However, these leaves should not be eaten because they also contain toxic compounds.

- Scientific Name: *Viburnum acerifolium*
Common Name: Maple-leaf viburnum

Viburnums (Rate 4): These are relatives of the honeysuckles. Most allergy, though uncommon, occurs from close, direct inhaling of the small, white, lightly fragrant flowers. Viburnum is eaten by caterpillars (primarily the foliage). Viburnum berries are eaten by white-footed mouse, eastern chipmunk, and various tree squirrels.

Plant Type

Deciduous-Tree

- Scientific Name: *Acer rubrum*
Common Name: Red maple

Acer rubrum (Rate 1): They vary in allergenic potential. During winter, red maple is an important source of food for elk and white-tailed deer.

- Scientific Name: *Cornus florida*
Common Name: Flowering dogwood

Cornus (Rate 5): In rare occasions, these are implicated in allergy. Avoid direct contact with flowers.

- Scientific Name: *Prunus pensylvanica*
Common Name: Fire cherry
- Scientific Name: *Prunus serotina*
Common Name: Black cherry

Prunus (Rate 7): These are popular and useful landscape shrubs and trees. Its cherries are eaten by songbirds and its seedlings and saplings are eaten by deer and rabbits.

Plant Type

Forb-Perennial

- Scientific Name: *Aster cordifolius*
Common Name: Blue heart-leaved aster
- Scientific Name: *Aster divaricatus*
Common Name: White wood aster
- Scientific Name: *Aster sagittifolius*
Common Name: Arrow-leaved aster

Aster (Rate; doubles 6, singles 8): Not all asters produce the same amounts of pollen. However, a few of these plants in a large garden should not cause many problems.

- Scientific Name: *Erythronium albidum*
Common Name: White trout-lily
- Scientific Name: *Erythronium americanum*
Common Name: Yellow trout lily

Erythronium (Rate 2): These are perennials native to the west.

- Scientific Name: *Geranium maculatum*
Common Name: Wild geranium

Geranium (Rate 3): These plants produce many small flowers and their leaves lack the strong scent of the pelargonium.

- Scientific Name: *Iris cristata*
Common Name: Dwarf crested iris

Iris (Rate 4): Iris roots may cause allergies and skin rash. Also, odor-sensitive individuals may be allergic to iris fragrance.

- Scientific Name: *Lilium canadense*
Common Name: Canada lily

Lilium (Rate 4): Many lilies if eaten are poisonous and those who handle large numbers of lily bulbs frequently develop contact rashes.

- Scientific Name: *Solidago caesia*
Common Name: Blue-stemmed goldenrod

Scientific Name: *Solidago erecta*
Common Name: Slender goldenrod

- Scientific Name: *Solidago flexicaulis*
Common Name: Zigzag goldenrod
- Scientific Name: *Solidago hispida*
Common Name: Hairy goldenrod
- Scientific Name: *Solidago ulmifolia*
Common Name: Elm-leaved goldenrod

Solidago (rate 8): These are related to ragweed and therefore can cause allergies though less potent than ragweed. Thirty percent of those who suffer from ragweed, are also allergic to goldenrod pollen. The caterpillars of many moths, greater prairie chicken and ruffed grouse feed on goldenrod foliage. The seeds are eaten by goldfinch and prairie chicken.

Field and Prairie Species

Plant Type

Deciduous-Tree

- Scientific Name: *Malus coronaria*
Common Name: Wild crabapple

Malus (Rate 4): These do not cause many allergies but those who live next to orchards may be hypersensitive to apple trees. Apple blossom pollen are in the rose family and therefore, people allergic to roses are more likely to develop allergies to these.

The caterpillars of many moths feed on its leaves and its fruit tastes sour. Other feeders include beetles and weevils, songbirds, black bear, and deer mouse.

Plant Type

Forb-Perennial

- Scientific Name: *Aster ericoides*
Common Name: Health aster, White wreath aster
- Scientific Name: *Aster laevis*
Common Name: Smooth aster
- Scientific Name: *Aster novae-angliae*
Common Name: New England aster

- Scientific Name: *Aster oolentangensis*
Common Name: Sky blue aster

Aster (Rate; doubles 6, singles 8): Not all asters produce the same amounts of pollen. However, a few of these plants do not cause many problems.

The juice from aster ericoides is sucked by aphids, lace bugs and plant bugs. The flowers, foliage and stems of aster laevis are eaten by deer, rabbits and groundhogs. The caterpillars of the butterfly chlosyne nycteis feed on its foliage.

Aster oolentangensis has low food quality but is however occasionally eaten by rabbits, deer, groundhogs and livestock. The caterpillars of the butterfly chlosyne nycteis also feed on this plant.

- Scientific Name: *Ruellia humilis*
Common Name: Wild petunia

Rue (Rate 4): Contact skin rash is common. Also, rue odor may bother sensitive individuals.

- Scientific Name: *Solidago juncea*
Common Name: Early goldenrod
- Scientific Name: *Solidago nemoralis*
Common Name: Gray goldenrod
- Scientific Name: *Solidago riddellii*
Common Name: Riddell's goldenrod
- Scientific Name: *Solidago rigida*
Common Name: Stiff goldenrod
- Scientific Name: *Solidago speciosa*
Common Name: Showy goldenrod

Solidago (Rate 8): These are related to ragweed and therefore can cause allergies though less potent than ragweed. Thirty percent of those who suffer from ragweed are also allergic to goldenrod pollen.

The caterpillars of many moths, greater prairie chicken feed on the foliage of solidago juncea. Also, insects such as lace bugs, leafhoppers, and seed beetles feed on this plant.

The caterpillars of many moths, and insects such as lopidea media, calopteron reticulatum feed on the foliage of solidago nemoralis. Its seeds are fed on by prairie chicken and eastern goldfinch.

Small birds feed on the seeds of *solidago rigida*.

The various parts of *solidago speciosa* are fed on by the caterpillars of many moths. Other insect feeders include leafhoppers, lace bugs, plant bugs and beetles. Its seeds are eaten by eastern goldfinch and greater prairie chicken to a limited extent.

Small Trees/Large Shrubs (15-14') that are hypoallergenic

- Scientific Name: *Cornus drummondii*
Common Name: Roughleaf dogwood

Cornus (Rate 5): In rare occasions, these are implicated in allergy. Avoid direct contact with flowers.

The clusters of the tiny flowers of *Cornus drummondii* provide nectar for many butterflies species and many birds eat its white fruit clusters.

- Scientific Name: *Viburnum dentatum*
Common Name: Arrowwood viburnum
- Scientific Name: *Viburnum lentago*
Common Name: Nannyberry viburnum
- Common Name: *Viburnum prunifolium*
Common Name: Blackhaw viburnum
- Scientific Name: *Viburnum trilobum*
Common Name: American cranberry-bush viburnum

Viburnums (Rate 4): These are relatives of the honeysuckles. Most allergy, though uncommon, occurs from close, direct inhaling of the small, white, lightly fragrant flowers. *Viburnum* is eaten by caterpillars (primarily the foliage). *Viburnum* berries are eaten by white-footed mouse, eastern chipmunk, and various tree squirrels.

During fall season, the berries of *Viburnum prunifolium* are a great source of food for birds and other wildlife

During mid winter season, the berries of *Viburnum trilobum* make an excellent source of food for birds.

Methodology and References for Selected Ohio Native Plants for Landscape and Restoration Use that are Hypoallergenic

Literature-review and cross-referencing was done by the utilization the following articles and websites

Allergy Friendly Gardening

www.associatedcontent.com/article/29218/allergy_friendly_gardening.html

American Beauties

www.abnativeplants.com/index.cfm/fuseaction/plants.plandetail/pant_ID/20

Cofrin Center for Biodiversity

www.uwgb.edu/BIODIVERSITY/herbarium/trees/prupen01.htm

Easy Wild Flowers

www.easywildflowers.com/quality/sol.rigid.htm

Floridata

www.floridata.com/ref/c/cornus_f.cfm

Gardening with Allergies

www.achooallergy.com/gardeningwithallergies.asp

Henriette's Herbal Homepage

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Missouri Plants

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NDSU Agriculture

www.ag.ndsu.edu/trees/handbook

Ogren, Thomas Leo. Allergy-Free Gardening: The Revolutionary Guide to Healthy Landscaping
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Selected Ohio Native Plants for Landscaping and Restoration Use

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www.planetbotanic.ca/fact_sheets/wild_hydrangea_fs.htm

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