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Green Cincinnati Plan – Energy Efficiency Recommendation Closed Loop Ground Source Heat Pumps for New Construction

What is it and why is it important to the City of Cincinnati?

According to the U.S. Environmental Protection Agency (EPA), closed loop ground source heat pumps (GSHP) are the most energy efficient, environmentally clean, and cost effective systems for temperature control. Although most homes and buildings still use traditional furnaces and air conditioners, GSHPs are becoming more popular. In recent years, the U.S. Department of Energy and the EPA have partnered with industry to promote the use of GSHPs.

A GSHP system uses the Earth's thermal properties in conjunction with electricity to provide unprecedented efficiency. For every unit of electricity the system uses, it provides up to five units of heating energy, giving a GSHP system a 500 percent efficiency rating. This recommendation focusing on incorporating these GSHPs into the new construction of both homes and buildings will help in energy and cost savings around Cincinnati.

Source: http://www.eia.gov/energyexplained/index.cfm?page=geothermal_heat_pumps
<http://www.willisonhour.com/geothermal.html?bc=1529557090&matchType=b&keyphrase=geothermal+heat+pump&creativeId=12165023541&c=1529557068&provider=google>

Even though the installation price of a GSHP system can be several times that of an air-source system of the same heating and cooling capacity, the additional costs are returned in energy savings in four to twelve years. System life is estimated at 25 years for the inside components and 50 plus years for the ground loop.

Below are the main types of GSHP systems:

- Closed-loop
 - Horizontal – most cost effective for residential
 - Vertical – often used for large commercial buildings or schools
 - Pond/Lake – must have adequate body of water

<http://energy.gov/energysaver/articles/geothermal-heat-pumps>

Even sewage is being studied as a possible heat sink that can be used like a pond or lake for system similar to GSHP - <http://www.pri.org/stories/science/environment/king-county-in-washington-trying-to-convert-sewage-to-energy-11325.html>

It is important to emphasize, GSHP systems are not a silver bullet and other energy efficiency measures like air sealing and insulation should be implemented to take full advantage of GSHPs. Proper sizing and installation are critical to achieving the high efficiencies that these units can offer

Who will be the targets for this recommendation?

- Commercial new construction or retrofits are recommended to be mandatory in appropriate circumstances. This could be accomplished through an ordinance adopted by City Council.

- Residential new construction or retrofits are recommended to be promoted through informational tools or could receive City incentives. This could be accomplished in cooperation with realtors, developers and other parties involved in the process of building or selling residential properties.

How does it affect GHG emissions?

Higher efficiency equals less need for fossil fuels like electricity for air conditioning or burning natural gas for heat.

Estimated annual GHG emission reduction?

According to the EPA, GSHP can reduce energy consumption and corresponding emissions up to 44 percent compared to air-source heat pumps and up to 72 percent compared to electric resistance heating with standard air-conditioning equipment (<http://www.nrel.gov/docs/legosti/fy98/24782.pdf>). Use of the ground rather than the outside air as a heat source reduced measured energy use for heating by 50 to 60 percent in two U.S. studies (Shonder et al., 2000; Johnson, 2002). Due to the large energy losses (typically 60–65 percent) in generating electricity from fossil fuels, heat pumps are particularly advantageous for heating when they replace electric-resistance heating (approximately 30 percent of the households in the City of Cincinnati use electricity for heating– American Community Survey 2011).

Conservatively estimating that a 40 percent reduction in energy used for heating and cooling can be achieved through installation or retrofit with GSHPs, and using data from the EPA that estimates that the average energy usage related to heating (natural gas) and cooling (electricity) is 67 and 6 thousand British Thermal Units (MBTUs) respectively, 27 MBTUs of natural gas and 2.4 MBTUs of electricity could be saved for each household that installed a geothermal heat pump system. Although these energy savings translate into significant dollar savings, the conversion from a high efficiency gas system to a geothermal heat pump for heating has limited impact on greenhouse gas emissions.

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can implement a policy for required or incentivized use of GSHPs. Under this policy, all new facilities or major renovations where the building systems such as HVAC, windows, air sealing and insulation are to be upgraded will consider the use of GSHP in the initial planning stages. A system other than GSHP can be used if it can produce greater energy savings and has a life-cycle cost effectiveness using the Building Life-Cycle Cost (BLCC) program with a Savings to Investment Ratio greater than 1.25. Otherwise, the GSHP system must be used.

Some of the other options that could be evaluated include high efficiency furnaces and high Seasonal Energy Efficiency Ratio (SEER) rated air conditioners. High efficiency furnaces can achieve efficiencies as high as 97 percent, converting nearly all the fuel to useful heat for the home. The EPA estimates that ENERGY STAR labeled heating equipment, when properly sized and installed, can save consumers 10 percent to 40 percent on heating bills. ENERGY STAR furnaces are highly efficient, use less energy than conventional systems, and help reduce pollution associated with energy use. Substantial energy savings can be

obtained from more efficient systems. For example, by upgrading from SEER 9 to SEER 13, the power consumption is reduced by 30 percent. This can result in an energy savings valued at up to \$300 per year depending on the usage rate and the cost of electricity. Duke Energy is currently offering rebates for air conditioners and heat pumps rated at 14 SEER or better.

Source: http://en.wikipedia.org/wiki/Seasonal_energy_efficiency_ratio
<https://www.energyguide.com/library/EnergyLibraryTopic.asp?bid=tva&prd=10&TID=25705&SubjectID=10168>

Is it feasible?

Some obstacles to achieving this recommendation include:

- Funding
- Consumer resistance to a new heating method, people do not understand the benefits
- Finding the correct incentives to encourage people to use GSHPs
- Impact on landscaping in retrofit situations
- Not appropriate for some smaller yards
- Before drilling, the underground geology needs to be understood, and drillers need to be prepared to seal the borehole, including preventing penetration of water between strata.

How much would it cost?

Estimates for price, savings, and financing can be found for homes, businesses, schools, libraries, etc. through the following site: <http://www.geothermalgenius.org/>

The payback period for installing a ground source heat pump is estimated to be 12 years when replacing a typical natural gas system and 4 years when replacing electric heating.

Are there other positive impacts?

- Air Quality
- Jobs
- Additional value to structure: Home appraisers and real-estate agents are becoming educated on ground-source heat pump systems and therefore acknowledge such systems as a renewable energy source with greater value. Multiple Listing Service (MLS) is also currently updating their listing procedures to include renewable energies and green technologies.
- Elimination of the air conditioner compressor unit from the yard.
- Twice the lifetime span of traditional units

Source: http://www.aronco.com/geothermal_PPCCincinnati?gclid=CJjQitq40rICFQpgMgodBROAOw

Are there possible unintended impacts?

None.

Implementation Timeline

Short-term (One to Two Years): City leads to draft and pass the ordinance for required and incentivized GSHP systems. The City can support the promotion of GSHPs by Efficiency First Cincinnati and USGBC of Greater Cincinnati.

Long-Term (Five to Six Years): The City leads effort to include GSHP as option for meeting efficiency standards in update building code.

Green Cincinnati Plan – Energy Efficiency Recommendation Green Permitting

What is it and why is it important to the City of Cincinnati?

This recommendation describes why the City should implement a Green Permitting process to further incentivize green building. To assist with this process, each approving agency within the City should have a Green Building Professional designated to oversee approval of green projects.

Current approving agencies within the city have varying levels of familiarity with green building strategies. This often makes getting approvals for innovative sustainable strategies like grey-water harvesting, waterless urinals, and vegetated roofs harder than conventional design -sometimes slowing down the approval process. By designating at least one individual within each approving agency to be a green building professional (LEED Accredited Professional, Green Roof Accredited Professional, or other similar industry standard) and creating an expedited approval process for projects employing sustainable strategies, the City could incentivize green building strategies for new construction.

As part of a Department of Energy Grant, the Department of Planning and Buildings plan examiner and building inspection staff held a seminar on the 2009 International Energy Conservation Code (IECC) Fundamentals and a training course for LEED Certification. Three plan examiners and three inspectors plan on obtaining their LEED Green Associate certification. In addition, a full day LEED Workshop was provided to eight members of Planning and Buildings, and the City is now a member of the USGBC.

Examples of Green Permitting Programs

The City’s Green Permitting program could be modeled after similar programs in Hamilton, Ohio, and New Albany, Ohio, (described in the case examples) and could take the form of reduced/waived permitting fees, expedited review time, or both. The key to the success of such a program is to identify green building professionals within the permitting agency to assist in the review of projects attempting to use this process. Training sessions are available for the LEED Rating System, and Green Roofs for Healthy Cities also hosts training sessions. The local Chapter of the USGBC could be an additional resource for these training sessions.

New Albany, Ohio Case Example

Reduced Fee

Name: New Albany	Type of Entity: Village/Town	State: OH
USGBC Region: Heartland	Bill/Action Name: Ordinance O-34-2008	Date of Passage: OCT 21, 2008
Level of Government/Entity: Local	Policy Path: Legislative	Certification Requirement: Cert RI
Buildings Covered: P-C	Size/Cost Threshold:	LEED Rating System: LEED NC

Description: On October 21, 2008, the New Albany Village Council adopted Ordinance O-34-2008, enacting a green building incentive program for new commercial buildings. New buildings that achieve the minimum New Albany Village green building standard will receive a 20 percent reduction in commercial building permit application fees. Buildings with minor renovations that achieve the minimum New Albany Village green building standard will receive a 20 percent reduction in application fees for minor renovations. Buildings with major renovations that achieve the minimum New Albany Village green building standard will receive a 20 percent reduction in commercial building permit application fees. Buildings that achieve a level of LEED certification will receive an additional fee reduction incentive on a sliding scale: 1 percent for LEED Certified, 2 percent for LEED Silver certification, 3 percent for LEED Gold certification, and 5 percent for LEED Platinum certification.

New Albany (Continued)		
Size of Jurisdiction: 3,711	Census Year: 2000	Date Effective: NOV 21, 2008
Updated: 10/31/2008	Expiration Date:	Type of Policy: Statute/Ordinance
Incentive: Permit/Zone Fee Reduction	Minimum Performance Standard: LEED Cert	Target Performance Standard:
Incentive Description:		
Contact: Betty Bosko, Clerk of Council, bbosko@villageofnewalbany.org		
Link to Action: https://www.usgbc.org/ShowFile.aspx?DocumentID=5021		

Hamilton, Ohio Case Example

The City of Hamilton offers Green Building Development Incentives, granting projects pursuing LEED certification a reimbursement of the USGBC project registration fee. Developments seeking LEED Silver, Gold and Platinum certification may receive expedited permitting, a 50 percent reduction in the parking requirement and have Architectural Design Standards waived by the Planning Director. LEED Silver, Gold, and Platinum certification projects also receive a 20 percent, 25 percent, or 30 percent reimbursement of the building permit fee, respectively.

Who will be the targets for this recommendation?

Home builders and commercial contractors working with plan examiners and construction inspectors from the Department of Planning and Buildings.

Estimated annual GHG emission reduction?

Planning and Buildings oversees upwards of half a billion dollars worth of construction each year. By conservatively estimating cost of construction to be \$200/sf, that translates to 2.5 million square feet of space being created or repositioned for office, assembly, manufacturing, and other uses. Using a low estimate of 0.4 watts/hour/sf. of power consumption, 10 hours of use per day, and 250 working days per year equals 2500MWh/year. Through outreach and education of the design professionals, Planning and Buildings estimates that at least one percent of this power consumption will be reduced,

generating a savings of 25MWh/year for each year that the program exists. At 1 ton of CO₂ per megawatt hour this recommendation could save 175 tons of CO₂ per year by 2020.

How can the City of Cincinnati influence the initiation of this recommendation?

The City's Department of Buildings and Inspections can be trained in more green building techniques and use financial or time incentives to encourage more green construction.

Is it feasible?

Potential obstacles to achieving this recommendation:

- Knowledge gaps in green development quantification
- Communication shortfall
- Ownership structure and operating cost responsibility
- Funding issues
- The lack of expertise and resources for green building

These obstacles, along with potential solutions are included in the link below:

<http://www.costar.com/josre/JournalPdfs/06-Barriers-Green-Development.pdf>

How much would it cost?

Training and accreditation of staff would be a onetime cost of approximately \$1,000 per person. The costs of implementing the green permitting program would need to be evaluated by each department, but should be modeled after successful programs in other cities.

Are there other positive impacts?

By further incentivizing green building within the city, the entire community will benefit, our image as a green city will increase, and retention/attraction of residents and businesses will be easier.

Are there possible unintended impacts?

Diversion of resources from other projects.

Timeline for Implementation

Green training is ongoing. Green incentives are short-term.

Short-Term, Mid-Term and Long-Term (One to Six Years): City takes lead to maintain green training for Planning and Buildings.

Green Cincinnati Plan – Energy Efficiency Recommendation

Building Performance Disclosures

What is it and why is it important to the City of Cincinnati?

This recommendation describes why the City of Cincinnati should support building performance disclosures as part of real estate transactions to appropriately value green buildings, encouraging developers and sellers to invest in building upgrades and to receive appropriate return on investment.

Currently, green buildings are not promoted to their full value. It is left to the real estate agent to properly represent the green features. Often times, the agent is not familiar with the value that green features bring to a building or how large of a cost energy is for a building. This also makes it possible that the seller will not receive their proper return on investment.

The average homeowner spends over \$2,000 each year on energy costs, more than on either property taxes or home insurance. Yet taxes and insurance are regularly accounted for in mortgage underwriting, while energy is ignored. Below is a chart demonstrating the significance of energy costs.



Information is required for buyers to understand the houses they buy. Realtors discuss the individual strategies (furnace age, newer windows, ENERGY STAR appliances) but do not discuss the overall performance of the house. A similar comparison would be trying to sell a car on its properly inflated tires and aerodynamic shape, but not discussing the overall performance rating of miles per gallon fuel efficiency. If a rating such as this were used to sell a house, it would describe in a simple manner, the overall performance of the house.

If an overall building performance disclosure was included on all real estate listings then not only would sellers receive their return on investment, but it would also encourage developers and sellers to invest in performance upgrades.

Approaches for achieving this program:

Team Building:

Team building at the local level would be necessary between the real estate, green design, construction, and rating communities to require the addition of a building performance disclosure on all building listings.

Realtor Education:

It would be imperative that the real estate community be educated about green building strategies and rating systems. They would need to understand not only the value of the individual strategies, but also whole-house performance ratings. Local real estate companies could have several of their realtors become LEED accredited professional or the industry could create a green certification for realtors. There is a current certification from the organization Ecobroker, which trains realtors in green strategies.

Source: www.ecobroker.com

New Homes:

New homes can be evaluated by their ResCheck score, which is submitted with each building permit. This system schematically measures the energy performance of the building. The system is in place but is not third party verified and is prone to inaccurate information. The intent should be to move toward third party verified rating systems such as the Home Energy Rating System (HERS) index developed by Residential Energy Services Network (RESNET). The HERS index is recognized by Energy Star and several financial institutions that provide green mortgages and is third party verified. However, the HERS index only scores energy performance. A more comprehensive scoring system is the LEED program. LEED is third party verified. It is a point system that rates the building in terms of energy use, site design, water conservation, indoor air quality, and material use. Each building would have a HERS score for the real estate listing if the Building Department required the more inclusive HERS rating over the simplified ResCheck.

Existing Homes:

A homeowner can pay to have a HERS rating completed on their house, with or without new construction. The U.S. Green Building Council (USGBC) does not have a system like LEED to rate existing residential buildings. Other cities have written their own systems for evaluating existing homes. A similar system could be adopted for Cincinnati. The USGBC has identified this gap in the LEED rating system and is developing a rating system to address this gap.

Additional Resources:

- RESNET information: <http://www.resnet.us/>
- HERS rating information: <http://resnet.us/professional/rater/what-is-a-hers>
- Building Energy Codes Program: <https://www.energycodes.gov/resource-center/ACE/enforcement/step2>

Build off Commercial Sector

Building performance disclosures are becoming commonplace in the commercial sector. Providing sustainability data and energy consumption data are just part of the typical due diligence of commercial real estate transactions. Tools like the EPA's Energy Star Portfolio Manager and COMNET show how third party verified rating systems can work for the residential market.

How will this recommendation be implemented?

Implementation efforts should be led by the Green Umbrella Energy Efficiency Action Team and should include:

- *Realtors* – must lobby their own industry to make it standard to have a building performance disclosure on the listing. At first, it may be blank on most listing, but eventually it will become standard as competition grows.
- *Third Party Verification* – more raters will be required to fill the need. Local colleges could offer classes for raters.
- *Local Green Building Organizations* – groups such as USGBC, AIA-COTE, and NAHB need to help with education and also to lobby the real estate industry to promote the valuation of green building practices.

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can partner with the identified groups in this recommendation to create policies and procedures for building performance disclosure within Cincinnati.

Is it feasible?

Potential obstacles to achieving this recommendation:

- Consistency of the building performance disclosure procedure and documentation
- Resistance by real estate professionals

How much would it cost?

There would be education costs for realtors who become certified in a green building program. Homeowners would have to pay for third party testing, approximately \$400-\$600/house for a typical HERS rating. If a HERS index was required for building permits, this would be a standard fee for all new projects.

Are there other positive impacts?

A competitive system such as this would help promote green building strategies. There would be an appropriate return on investment for developers and homeowners who have invested in environmental upgrades. Using an agreed upon rating system would also help with mortgage institutions that offer green financing and communities with available grants and tax incentives. Also, an agreed upon rating system would help structure tours and homefests, further promoting green design. Finally, additional jobs would be created for HERS raters.

Are there possible unintended impacts?

Possible backlash from private sector regarding additional requirement

Timeline for Implementation

Short-term (One to Two Years): The Green Umbrella Energy Efficiency Action Team has made this effort their focus project for 2013 and to develop a system for green MLS.

Green Cincinnati Plan – Energy Efficiency Recommendation

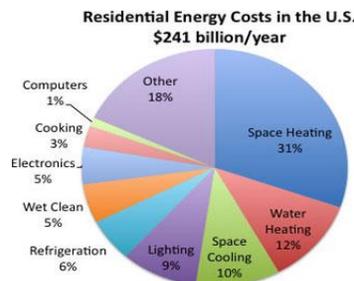
Marketing of Energy Efficiency to Residents and Businesses

What is it and why is it important to the City of Cincinnati?

Residential Market Overview

Residential Energy Costs in the U.S. are approximately \$241 billion per year, leaving room for significant cost savings and environmental benefits from improving residential energy efficiency. This recommendation describes strategies the City of Cincinnati can undertake to help promote residential energy efficiency in the areas included in the chart below. Energy efficiency upgrades can also improve indoor air quality and make homes safer and more comfortable.

Possible areas in the home for energy efficiency upgrade include:



Source: <http://homeenergysaver.lbl.gov/consumer/learn>

Saving energy at home should be a no-brainer where savings on utility bills can easily pay for the energy efficiency improvements themselves – particularly with the current low interest rates. Unfortunately, confusion in the market place has limited the number of homeowners making these investments. The Greater Cincinnati Energy Alliance (GCEA) is an example of the possibilities of aligning third party audits and contractor screening, with financing and incentives and trusted contractors. Even larger successes are possible if the marketing power of building systems and the energy efficiency industry (such as HVAC, windows, air sealing and insulation) can be coupled with third party measurement, verification and guidance, utility rebates and traditional financing.

Recommended strategies to help promote energy efficiency among residents:

Create a More Understandable Energy Efficiency Metric

The average resident may not be familiar with terms like metric tons of carbon dioxide or kilowatt hours (kWh). Using a metric like the equivalent number of cars you take off the road from making energy efficiency improvements could help residents better understand their potential impact.

More Education on Importance of Reducing Energy Usage/Greenhouse Gas

Recent events like Superstorm Sandy and the ongoing drought raised awareness about the importance of reducing greenhouse gases. Through educational programs, residents can understand the positive impacts they can have by reducing their energy usage. Some effective educational programs include:

- The Consumer Education Program for Residential Energy Efficiency: An educational effort conducted in partnership with Cornell Cooperative Extension and the New York State Energy Research and Development Authority
Source: <http://www.joe.org/joe/2009december/a6.php>
- SaveEnergyCincy – A local effort aimed to train groups like community groups, businesses, condominium associations, senior centers, and church groups to learn the available technologies and teach others about money and environment-saving energy efficiency techniques. Source: <http://www.saveenergycincy.com/>

Use Highly Visible Marketing Strategies

There is a sense the ideas and methods involving energy efficiency still have not entered the mainstream. Finding and exploiting new venues is important to reaching everyday households. Some strategies to increase visibility of energy efficiency to the public include:

- Use Fountain Square’s big screen to promote easy every day energy efficiency actions
- Create an Energy Efficiency Showcase retrofit home at Greenarama/Homearama
- Have a presence at the Home & Garden Show to showcase energy efficiency in buildings
- Special offers similar to Duke Energy’s rebate program can promote energy efficiency
- Work with trade groups such as Greater Cincinnati Chapter of the Air Conditioning Contractors of America and Efficiency First Cincinnati as well as industry leaders such as Owens Corning and Johns Manville to make energy efficiency more mainstream

Recommended strategies to help promote energy efficiency among residents and businesses:

Leverage Existing Green Community

Green Umbrella’s Energy Challenge is tapping the networks of Green Umbrella and the resources and technical expertise of Greater Cincinnati Energy Alliance (GCEA) to promote home energy assessments and improvements.

Take The Energy Challenge: <http://www.greenumbrella.org/energy-challenge>

Promotion of Energy Star

EPA’s ENERGY STAR campaign is a national marketing campaign inviting Americans to join in the fight against climate change with ENERGY STAR Home Performance. Through its partnerships with more than [20,000 private and public sector organizations](#), ENERGY STAR delivers the technical information and tools that organizations and consumers need to choose energy-efficient solutions and best management practices. ENERGY STAR has successfully delivered energy and cost savings across the country, saving businesses, organizations, and consumers about \$18 billion in 2010 alone. Over the past decade, ENERGY STAR has been a driving force behind the more widespread use of such technological innovations as efficient fluorescent lighting, power management systems for office equipment, and low standby energy use.

Specifics for a Residential Home

Energy efficient choices can save families about a third of the cost on their energy bill with similar savings of greenhouse gas emissions, without sacrificing features, style or comfort. ENERGY STAR helps residents and businesses make the energy efficient choice:

- If looking for new household products, look for ones that have earned the ENERGY STAR. They meet strict energy efficiency guidelines set by the EPA and US Department of Energy.
- If looking for a new home, look for one that has earned the ENERGY STAR.
- If looking to make larger improvements to your home, EPA offers tools and resources to help you plan and undertake projects to reduce your energy bills and improve home comfort.

Specifics for a Business

Because a strategic approach to energy management can produce twice the savings as typical approaches, EPA's ENERGY STAR partnership offers a proven energy management strategy that helps in measuring current energy performance, setting goals, tracking savings, and rewarding improvements for a business. EPA provides an innovative energy performance rating system which businesses have already used for more than 200,000 buildings across the country. EPA also recognizes top performing buildings with the ENERGY STAR.

One-stop Center for Energy Efficiency

The number of energy efficiency programs and resources continues to grow in the Cincinnati region. A method of collaboration and coordination for these programs and resources through a one-stop center for energy efficiency is essential to increasing accessibility of this information to businesses and the general public.

The Greater Cincinnati Energy Alliance (GCEA) currently has a website that is well on the way to becoming the one-stop shop for making residential energy improvements. The website includes answers to frequently asked questions about energy efficiency upgrades, links to resources and a list of the three major incentive programs for making energy efficiency improvements: federal tax credits, Duke Energy rebates, and GCEA incentives from the Department of Energy. The website also has links to resources for low-income homeowners (People Working Cooperatively, Cincinnati-Hamilton County Community Action Agency, Northern Kentucky Community Action Commission) and financing options including GCEA's own GC-HELP loan. GCEA's commercial energy efficiency website is not as robust as its residential one, an area which can be improved under this recommendation.

Although the GCEA has a solid start to creating a one-stop shop for residential energy improvements, there are some enhancements needed to ensure this site will serve as an inclusive resource for the community. It is important for the site to include more resources for all types of homeowners. References to gain more information on topics such as HERS, LEED, Passive House, Enterprise Communities, etc. should also be included.

Current website: <http://www.greatercea.org/residential-energy-efficiency>

Who will be the targets for this recommendation?

The target of this program is greater Cincinnati homeowners and businesses.

How can the City of Cincinnati influence the initiation of this recommendation?

- Help in promotional campaigns of the strategies above to ensure the message is reaching the greatest number of residents and businesses possible
- Provide incentives to residents who do make their homes more energy efficient
- Help lead in organizing information, resources, and programs to be included in the one-stop center for energy efficiency
- Local governments can adopt a range of policies and programs to encourage energy efficiency in new construction, existing homes, and new products. To support the programs, local governments also can develop financing options to help lower the cost of making energy efficiency improvements in new or existing homes. For each of these mechanisms, local governments may be able to coordinate with electric and gas utilities, regional energy efficiency organizations, trade groups (e.g., home builders, home energy raters, contractors, energy services companies, etc.), product retailers, and others to share information and leverage existing efforts. These stakeholders can help design, develop, and market local energy efficiency programs and policies.
- The City can provide continued funding to GCEA to ensure the one-stop shop continues to keep a frequently updated all-encompassing list of resources.

Source: <http://www.epa.gov/statelocalclimate/local/topics/residential.html#two>

Is it feasible?

Potential obstacles to achieving this recommendation include:

- Confusing audit tools – Duke Energy, HVAC contractors, GCEA
- Competitive industry - there must be something in it for the industry to help drive the marketing effort
- Time and resources needed to collect all the data for one-stop shop
- Resources to back all the strategies in this recommendation

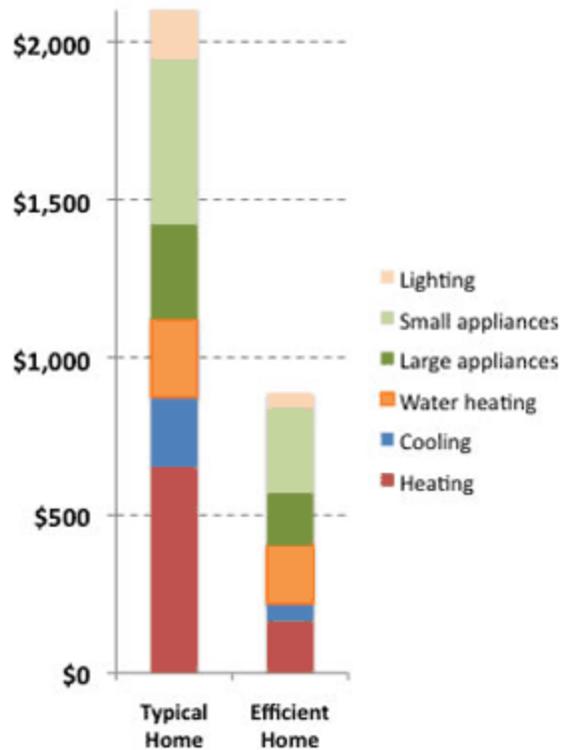
How much would it cost?

There is opportunity for this to be a low cost action for the City. The City can use existing resources like press releases, websites, Citicable, newsletters, and social media to help promote residential energy efficiency programs. More resources can always be used for more formal media campaigns that include advertising buys and associated production costs. A moderate cost approach may be to work with partners like Duke Energy, Greater Cincinnati Energy Alliance (GCEA), and the building systems and energy efficiency industries (such as HVAC, windows, air sealing and insulation) on a coordinated campaign with their existing resources.

Are there other positive impacts?

- Examples of non-energy benefits: <http://homeenergysaver.lbl.gov/consumer/nebs>
- Cost Savings (2009 Figures) <http://homeenergysaver.lbl.gov/consumer/learn-triple#money>

Annual Residential Energy Bills



Are there possible unintended impacts?

- Care must be taken when tightening a building's envelope to ensure some air circulation
- Previous homeowners and businesses may not want to disclose energy habits

Timeline for Implementation

Short-Term (One to Two Years): Update and enhance the GCEA website and use of existing City resources. Leverage industry marketing through partnership effort from City, Energy First, Dow, etc.

Mid-Term (Three to Four Years): Coordinated campaigns for each strategy with appropriate stakeholders. Leverage industry marketing through partnership effort from City, Energy First, Dow, etc.

Long-Term (Five to Six Years): Leverage industry marketing through partnership effort from City, Energy First, Dow, etc.

Green Cincinnati Plan – Energy Efficiency Recommendation

Renewed Focus on Commercial/Industrial Energy Efficiency Efforts

What is it and why is it important to the City of Cincinnati?

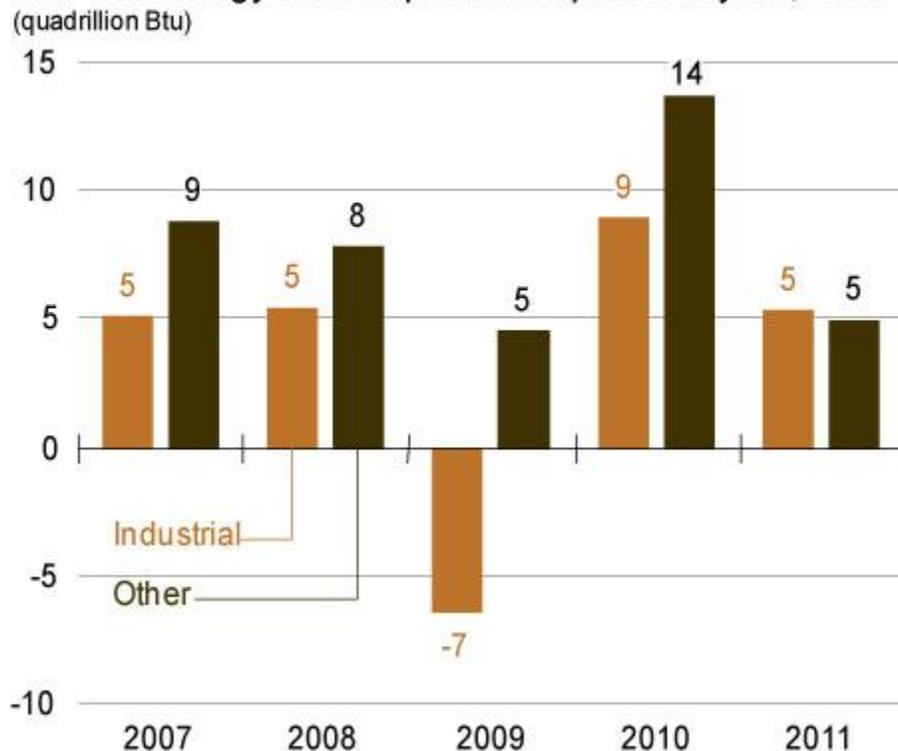
Commercial buildings account for approximately 19 percent of all energy consumption each year in the U.S. according to the Greater Cincinnati Energy Alliance.

Source: <http://www.greatercea.org/content/benefits-commercial-energy-efficiency>

Industrial consumption of energy decreased in 2009; however, there is still opportunity for improvement in the City of Cincinnati's industrial sector to further reduce its energy consumption and be a leader in efforts towards more energy efficient methods.

Source: <http://www.eia.gov/forecasts/ieo/industrial.cfm>

Figure 87. Annual changes in world industrial and all other end-use energy consumption from previous year, 2007-2011 (quadrillion Btu)



The data above shows the commercial and industrial sectors consume an enormous amount of energy each year. This recommendation focuses on the substantial opportunity to renew the City of Cincinnati's efforts on energy efficiency in these sectors. Below are several strategies and resources to help achieve this recommendation.

Recommended strategies and resources for commercial and industrial sectors: *Duke Energy Incentive*

With Duke Energy's Smart Saver Incentive program, businesses can receive cash for installing high-efficiency lighting, building systems such as HVAC, windows, air sealing and insulation, pumps, and other qualifying equipment. The use of energy efficient equipment enables businesses to improve their bottom lines by reducing energy consumption. Smart Saver incentives help lower the costs associated with upgrades.

By taking advantage of the Smart Saver program businesses can:

- Help buy down the incremental cost difference between standard and energy efficient equipment
- Invest in high-efficiency equipment without exceeding annual budgets
- Contribute to a greener environment by reducing the amount of natural resources needed to keep your business running
- Defer the need to construct additional electric-generating facilities, thereby keeping regional energy rates low and reducing emissions

Sources: <http://www.duke-energy.com/ohio-business/smart-saver-incentive-program.asp>
http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=OH18F&re=0&ee=0

Greater Cincinnati Energy Alliance Loan

The Greater Cincinnati Energy Alliance's Building Performance Program offers several services to commercial facilities that join the program such as:

- *Project Management*: providing owner representative services, managing ENERGY STAR building ratings, determining phases for project work
- *Financial Investments*: incentives to reduce the cost of energy assessments and upgrades, loans for energy efficiency projects, discounts on selected energy projects
- *Unbiased Advice*: on energy audit companies, regarding the best energy efficient equipment, on the upgrades with the highest return on investment
- *Post-Project Energy Programs*: ongoing energy measurement and verification, continuous commissioning and maintenance plans, occupant education, like Green Team development, school-based curriculum and teacher training

Proven success using this program:

- 62 facilities joining the Building Performance Program, worth \$27.6 million in energy improvement projects
- 47 sites undergoing energy audits or under construction
- 24 projects complete, investing over \$272,000 in incentives

Source: <http://www.greatercea.org/content/building-performance-program-services>

Greater Cincinnati Green Business Council's Energy Star Portfolio Manager Project

Launched in 2009, the Cincinnati Kilowatt Crackdown is a project where participating Cincinnati office buildings compete to save the most energy. The competition is done by benchmarking their energy performance in the ENERGY STAR Portfolio Manager tool, developing action plans, and implementing energy efficiency strategies. Competitors are assigned a free "Energy Coach" and compete for prizes, gift certificates, and the Grand Prize trophy.

Project sponsors for this program include the Greater Cincinnati and Dayton Institute of Real Estate Management, Duke Energy, ENERGY STAR, and Greater Cincinnati Building Owners & Managers Association. The Greater Cincinnati Green Business Council is encouraging more businesses to participate in ENERGY STAR Portfolio Manager. Source: <http://kwcd-cincinnati.com/>

Ohio Business Energy Resource Center

This organization provides small businesses with tips, tools, and resources to manage energy for short-term savings and long-term energy solutions.

Source: <http://www.sba.gov/content/state-and-local-energy-efficiency-programs>

Ohio Small Business Energy Saver

This strategy is a free, customized tool that matches business type with improvements that can make a business become more energy efficient.

Source: <http://www.sba.gov/content/state-and-local-energy-efficiency-programs>

COMNET – Commercial Energy Services Network

COMNET is a quality assurance initiative to standardize building energy modeling for the commercial sector by creating consistent baselines relative to various energy codes and standards. COMNET enhances productivity and quality by developing consensus guidelines and quality standards for building energy modeling and providing detailed specifications for energy analysis software.

Source: <http://www.comnet.org/sites/default/files/COMNET%20overview%20fact%20sheet.pdf>

Property Assessed Clean Energy (PACE)

PACE financing is designed to allow property owners interested in installing energy improvement projects the ability to take advantage of the lower interest rates and longer financing terms associated with public bonds. In effect, PACE allows the bundling of individual private sector energy improvement projects to take advantage of the scale, public backing, and capital nature of traditional municipal bonds. PACE for commercial projects has moved forward while residential PACE has been bogged down in the mortgage crisis.

Who will be the targets for this recommendation?

The targets for this recommendation include all industrial and commercial businesses in the Cincinnati region.

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can continue to promote the energy efficiency incentives currently in place within the region and work with energy efficiency programs to help create more incentives and spread the word about energy efficiency opportunities in the industrial and commercial sectors.

The City of Cincinnati could pull together a commercial/industrial group to discuss Duke Energy commercial/industrial rebates and Demand Response opportunities. This group could also help develop ideas for what else is needed to support the industry.

Is it feasible?

Potential obstacles to achieving this recommendation:

- Companies unaware of incentives – how do you reach all companies in these industries?

How much would it cost?

- Implementation costs for companies
- Promotional/educational costs

Are there other positive impacts?

- Lower operating costs
- Release cash for deferred maintenance
- Increase property value
- Extend equipment life
- Qualify for tax incentives
- Attract quality tenants
- Demonstrate green leadership

Source: <http://www.greatercea.org/content/benefits-commercial-energy-efficiency>

Are there possible unintended impacts? No.

Timeline for Implementation

Short-term (One to Two Years): Promote commercial incentives through partnership effort from City and Duke Energy. Organize access to these resources, which promote and assist in the use of energy efficient efforts within the commercial and industrial sectors, into one location so they are easily accessible to businesses and industries looking to participate. Committee to come up with recommendations regarding moving forward with the tax abatement and come up with a more specific timeline of how to achieve this.

Mid-Term (Three to Four Years): Pass Property Assessed Clean Energy (PACE) legislation with energy efficiency improvements eligible. Promote commercial incentives through partnership effort from City and Duke Energy.

Long-Term (Five to Six Years): Promote commercial incentives through partnership effort from City and Duke Energy.

Green Cincinnati Plan – Energy Efficiency Recommendation Existing Construction Energy Efficiency Tax Abatement

What is it and why is it important to the City of Cincinnati?

The purpose of this recommendation is to design a Tax Abatement Program to complement the successful City of Cincinnati LEED (Leadership in Energy and Environmental Design) (www.usgbc.org) Tax Abatement Program by including an alternative rating system for residential renovation.

History of LEED Tax Abatement

Cincinnati's original green building tax abatement ordinance was passed in 2006 and has been amended three times since, culminating in the current abatement rules clarifications passed on December 12, 2007. This program called for tax incentives for the construction of new residential, commercial and industrial properties to the LEED standard. It also provided a property tax incentive for a LEED certified residential renovation. However, at the time of passage, no feasible residential renovation LEED rating system existed. Therefore, it is recommended that the City amend the LEED abatement ordinance to adopt a different rating system for residential renovation.

Summary of Existing LEED Tax Abatement

The City of Cincinnati offers property tax abatements for residential and commercial buildings constructed or renovated to meet LEED certification standards. The incentive is available for any building within city limits and does not require a demonstration of financial need. The residential designation applies to structures with up to three units, including condominiums. Residential structures with four or more units are classified as commercial buildings. Industrial structures are also eligible to receive incentives under the commercial program. An agreement must be executed with the Department of Community Development before construction begins. The LEED Tax abatement ordinance is currently scheduled to sunset in 2017.

The current tax abatement rules are as follows:

Residential Buildings

- 100 percent property tax abatement for 15 years (new construction) or 10 years (existing building retrofits) up to \$562,792
- Market value limit increases by 3 percent each year
- No value limitation for structures that achieve LEED Platinum certification

Commercial and Industrial

- 100 percent tax abatement for 15 years (new construction) or 12 years (existing building renovations)
- No cap on the value of improvements
- Requires an agreement signed prior to the start of construction that must be approved by the City Council
- Owner must enter into an agreement with the local Board of Education district to pay the board an amount equal to 25 percent of the avoided property taxes

- Application fee of \$750 to the State of Ohio, plus an annual fee amounting to 1 percent of the value of the tax abatement with a minimum of \$500 and a maximum of \$2,500

Recent Action on LEED Tax Abatement

City Council issued a motion on October 1, 2012 to amend the current LEED Tax Abatement to encourage commercial and residential developers to attain higher levels of LEED Certification. The reasoning for this is because technological advances and builder experience have made it easier to attain the basic LEED Certification on projects. These changes of the City's LEED Abatement Program were put in place to incentivize developers to seek the highest certification ratings for commercial and residential projects.

Recommendations for Improving LEED Tax Abatement

For commercial projects that are LEED Certified or Silver, the program should provide an abatement of 75 percent (less 25 percent to the Cincinnati Public Schools). For commercial projects that are LEED Gold or Platinum, the abatement should remain at 100 percent (less 25 percent to Cincinnati Public Schools).

For *new construction residential projects*, the program should adopt the following tiered abatement approach:

- Certified = 12 years (\$562,792)
- Silver = 13 years (562,792)
- Gold = 14 years (\$562,792)
- Platinum = 15 years (no limit)

These recommendations are essential to ensuring Cincinnati has the most beneficial LEED Tax Abatement possible. By implementing these recommendations and increasing the number of LEED Gold and Platinum buildings in Cincinnati, this will result in important environmental impacts through reducing greenhouse gas emissions in the region, as these buildings are the most energy efficient and cost-efficient to operate.

What are tax incentives for existing building renovations in other jurisdictions?

The City of Forest Park, Ohio

Over the last two years, the Greater Cincinnati Energy Alliance (GCEA) and the Forest Park Environmental Program have combined their resources to make available generous subsidies that can be used by Forest Park residents to help defray the cost of needed home energy efficiency improvements. The Forest Park Environmental Awareness Program provides an additional subsidy to Forest Park residents. Forest Park subsidized air sealing and insulation improvements by 35 percent (max. subsidy \$4,000). When combined with GCEA's 50 percent (max subsidy \$1,500) subsidy at the time, 85 percent of a \$3,000 investment would be covered through this program.

Enterprise Green Communities

Enterprise, an affordable housing advocate organization has developed the 2011 Enterprise Green Communities Criteria to provide a clear, cost-effective framework for all affordable housing development types in any location in the country, including new

construction and rehabilitation in multifamily as well as single-family buildings. By becoming certified, developers can deliver significant health, economic and environmental benefits to low-income families. Enterprise has created the Enterprise Green Communities Offset Fund to make additional carbon emission reductions to the affordable housing they are already designing.

Multiple Counties in the State of Maryland

The state of Maryland permits local governments (Maryland Code: Property Tax § 9-242) to offer property tax credits for high performance buildings if they choose to do so. Baltimore County exercised this option in 2006 by creating property tax credits for new and existing multi-family residential (50+ units) and commercial buildings that meet certain high performance building standards. In 2008, the county also adopted a similar provision creating property tax credits for newly constructed high performance homes, and in 2010 added provisions for energy efficiency improvements in existing homes. For existing homes the baseline is determined by the existing energy efficiency of the structure prior to the improvements.

Who will be the targets for this program?

- Homeowners in the City of Cincinnati
- Commercial and residential developers and property owners

How does it affect GHG emissions?

Reducing the amount of electricity and natural gas usage has a direct impact on greenhouse gas emissions.

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati Department of Community Development, the City of Cincinnati Planning Department, and various community constituencies such as the USGBC can work together to ensure the City has the best rating system and verification method. Cincinnati City Council must then adopt an existing building energy efficiency ordinance that complements the LEED ordinance. Future additions or modifications to LEED may make it easier for more retrofits of existing buildings to qualify for the current abatement.

Is it feasible?

The primary obstacle to achieving this goal is funding.

How much would it cost?

If the City replicated a program similar to Forest Park's program and had participation of 250 residences per year, the program could cost as much as \$1,000,000 per year. It may be required to add a position at the city initially, with resources reassessed annually based on volume of applications.

Are there other positive impacts?

- Net savings would be projected directly toward citizens who live in these renovated residences. Most studies on green building estimate savings of between 20 percent and 30 percent in utility costs. If these costs are projected over the total number of buildings

that take advantage of this program, as well as over the lifetime of the project, these cost savings are significant.

- These renovated structures will be more efficient. With a reduction in utility usage, bills will be lower for the residents of these buildings. Green buildings also possess higher indoor air quality, which has the potential to lower healthcare costs.
- Renovated housing stock raises property values. It also gives Cincinnati a marketing edge as a progressive, green city. The Cincinnati building and development market will be able to utilize economies of scale, which have been proven to reduce green building premiums.
- Green renovation of existing housing stock has the ability to project the benefits of green building into low to moderate-income communities.
- Energy retrofit work cannot be outsourced, so this program would support the creation of local jobs.

Are there possible unintended impacts? No.

Timeline for Implementation

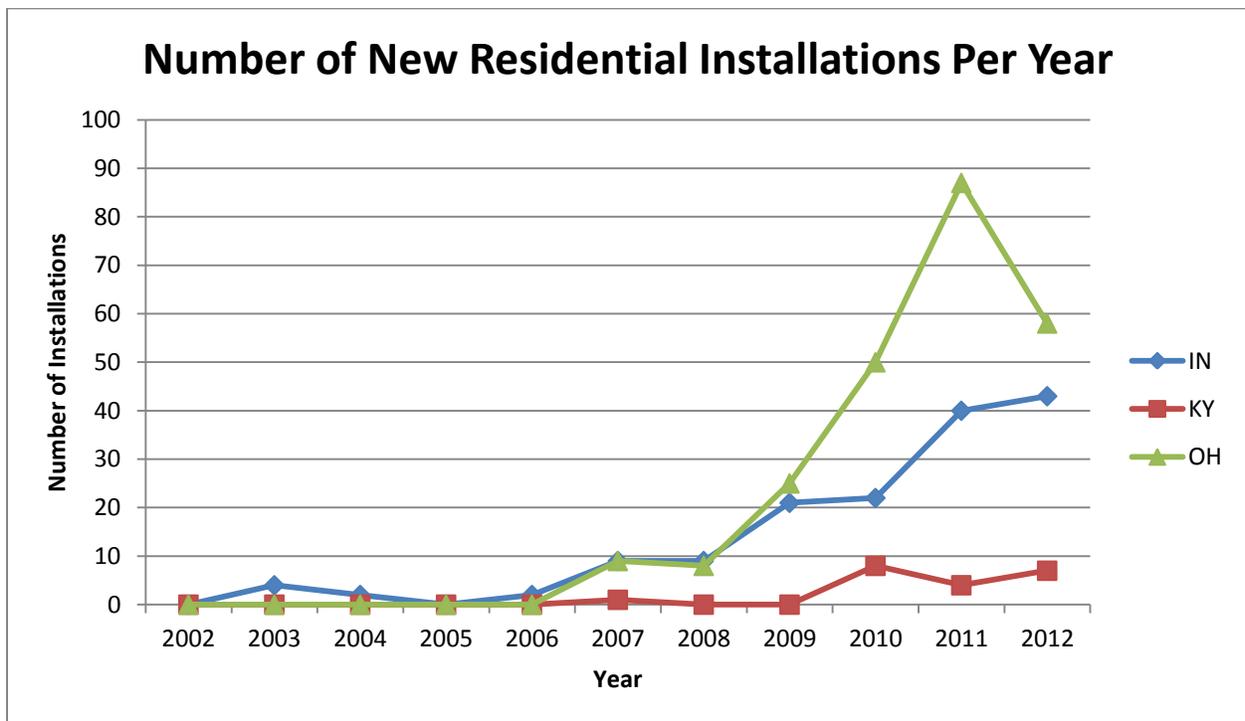
Short-term: This could be included in the overall energy work of the City – including electric and natural gas aggregation.

Green Cincinnati Plan – Renewable Energy Recommendation Lobby State of Ohio to Strengthen the Market for Solar Projects

What is it and why is it important to the City of Cincinnati?

As the fourth largest contributor of greenhouse gases in the U.S., Ohio is one of the largest energy users in the country. Clean, homegrown technologies, such as energy efficiency and renewable energy, can transform Ohio's economic and energy future. For every dollar invested in energy efficiency, at least three dollars are saved on energy costs, while also creating Ohio jobs in manufacturing, construction, research, and design. Ohio's universities, utilities, training centers, and businesses are also helping propel the state forward through investments in wind, solar, and other renewable technologies.

The State of Ohio has initiated programs to help switch to more renewable energy sources. Recent policy steps have weakened the impact of two of these programs. Strengthening the Renewable Energy Portfolio Standard, switching the Advanced Energy Fund back to a grant program and incorporating renewable energy requirements into building codes could jump start more solar projects in Cincinnati.



Renewable Energy Portfolio Standard

To promote the production of more renewable energy, Ohio initiated a Renewable Energy Portfolio Standard (RPS) which is administered by the Public Utilities Commission of Ohio (PUCO). The RPS is part of the alternative energy portfolio standard that requires 25 percent of electricity sold by Ohio's electric distribution utilities or electric services companies must be generated from alternative energy sources by 2025. At least half of this

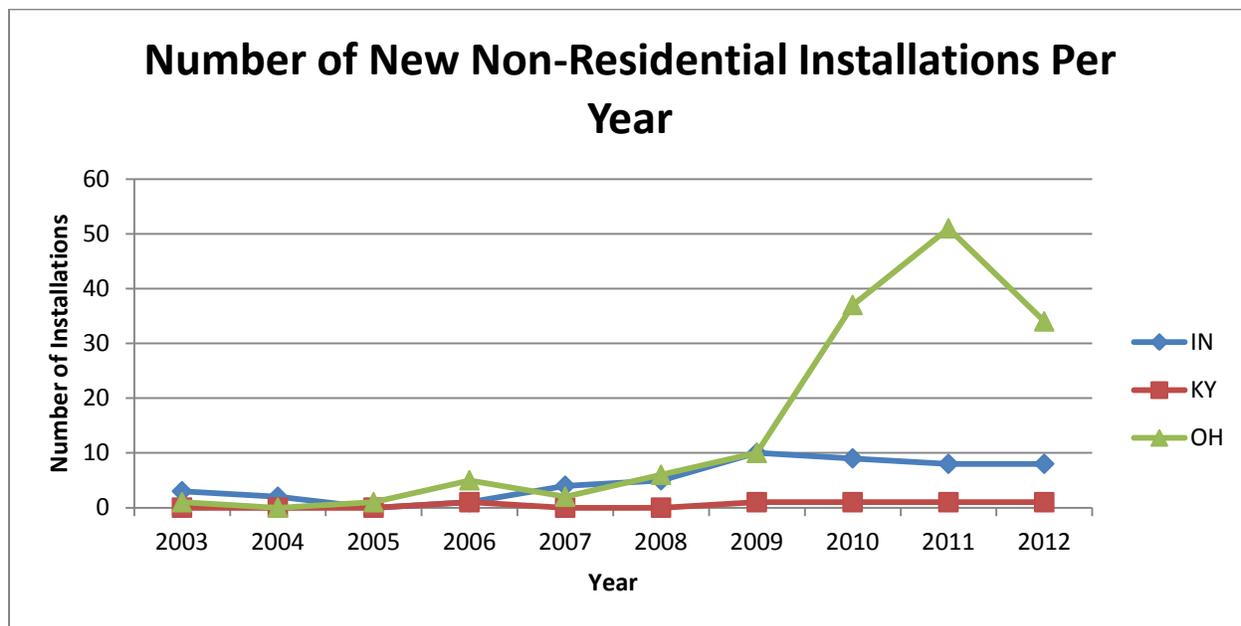
energy must come from renewable sources, such as solar, wind, biomass, and hydro with a minimum of one-half percent coming from solar resources. Half of the renewable energy facilities must be located in Ohio.

If the City of Cincinnati wants to strengthen the current market for solar projects, it is essential to lobby the State of Ohio for an increased renewable portfolio standard (RPS). By increasing the RPS, utilities would be incentivized to increase the amount of energy produced from renewable energy sources. Not only would lobbying the state of Ohio for increasing RPS make solar projects more financially feasible, but it also would allow for an increase in new jobs and investment in the region and decrease the CO₂ emissions in our air. Lobbying for increased RPS would also allow Ohio to grow into a regional leader in renewables since there are only 6 other states with higher standards than Ohio's 25 percent standard.

PUCO's RPS is set to expire in 2016. With volatility in the Ohio Solar Renewable Energy Certificate (SREC) market and general decline in SREC prices, increasing the RPS would make solar projects more financially feasible. The SREC price decrease can be seen here: http://www.srectrade.com/ohio_srec.php

One recommendation for stabilizing the SREC price is to close Ohio's SREC market. By closing Ohio's market, other states would not be allowed to sell SRECs in Ohio, which would increase prices and help stabilize the market.

Source: http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=OH14R



Solar Grant Program

Established under Ohio Revised Code (ORC) section 4928.63, the Advanced Energy Fund was funded under ORC 4928.61 that provided for a rider, calculated at \$0.09/month per utility bill on retail electric service rates until December 31, 2010. The rider has not been

renewed. As a result, the Advanced Energy Fund grant program transitioned to the Energy Loan Fund, which is designed to sustain the remaining funds as a revolving loan fund. Cincinnati should support efforts to reauthorize the Advanced Energy Fund.

Source: <http://www.development.ohio.gov/Energy/Incentives/AdvancedEnergyFundGrants.htm>

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standards in New Buildings

ASHRAE has developed standards for energy efficiency with a goal toward net-zero buildings. These standards should be incorporated into all eligible building codes within the City of Cincinnati.

The City of Cincinnati could partner with the (ASHRAE) to develop these energy efficient standards for building codes. The City of Cincinnati would need to discuss with experts in this field to determine what standard should be used. The ASHRAE website describes ASHRAE more in detail: <http://www.ashrae.org/>

Who will be the targets for this recommendation?

The targets for this recommendation are the State of Ohio government and, in particular, the Public Utilities Commission of Ohio (PUCO), City of Cincinnati Planning and Buildings and the LEED Tax Abatement Program.

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati has a state lobbyist, and the City could join with other local governments to create a coalition to lobby for these changes. Green Energy Ohio (GEO) should also be part of the coalition.

Is it feasible?

Working with utility providers would also be necessary to overcome possible opposition. The current state administration may not be inclined to make these changes.

How much would it cost?

Changes to the renewable portfolio standard and the reinstatement of a state grant program would have no direct cost to the City but may slightly impact utility bills. The City lobbyist may need to spend time on this issue.

Are there other positive impacts?

- Air Quality - public health benefits, such as reducing the harmful air pollution from coal that can lead to asthma attacks and other health impacts
- Opportunities for new business projects surrounding renewable energy
- Drive down cost of specific technologies as we gain more experience with them (solar panels, etc.)
- Ensure resource diversity – reducing risk for customers by making sure they are not wholly dependent on one source of energy
- Opportunity for Ohio to continue its leadership with solar power

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): Work with Green Umbrella, Ohio Urban Sustainability Directors Network (USDN) to protect RPS from legislative action

Mid-Term (Three to Four Years): Work with Green Umbrella, Ohio USDN to strengthen RPS when it expires in 2016 or with more sympathetic State government

Long-Term (Five to Six Years): Work with Green Umbrella, Ohio USDN push for more solar in building code

Green Cincinnati Plan – Renewable Energy Recommendation
Virtual Net Metering for Shared Solar

What is it and why is it important to the City of Cincinnati?

Virtual net metering and shared solar can offer efficient and easy opportunities to solve some common issues often faced by solar generators. For example, in Ohio, if a facility builds a solar installation that produces more electricity than the facility can use, the facility can only sell it back into the grid at the wholesale price rather than the retail price a customer pays. Shared solar would allow a generator to sell electricity to others who could reduce their retail consumption of energy. Virtual net metering would allow a renewable energy producer to assign the net production to other metered accounts that are not physically connected to that generator.

Municipal Electric Utility Option

Berea, KY: Berea Solar Farm has experienced success since its inception. In only four days, Berea Municipal Utilities (BMU), Kentucky, sold all 60 available solar leases for the first-phase of the Berea Solar Farm. The first-phase of the Berea Solar Farm enabled customers to lease up to two 235-watt solar panels over a 25-year period, for one-time fee of \$750 per panel. Through economies of scale, customers get these shares at close to \$3.19 per watt installed. The success of the first-phase of the Berea Solar Farm led BMU to offer a second-phase solar farm. The City of Cincinnati does not have a municipal electric utility; however, if they wanted to develop a solar farm, Berea could be used as a model for setup and pricing. Source: http://apps3.eere.energy.gov/greenpower/news/news_template.shtml?id=1691

As can be seen from the chart below, several states have adopted Virtual Net Metering policies that allow both residents and municipalities to participate. Cincinnati should work for regulatory approvals to allow similar programs in Ohio.

Source: <http://blog.syndicatedsolar.com/bid/69675/Virtual-Net-Metering-Credit-Sharing-for-Solar-Gardens>

State	Policy	System Size Requirements	Eligible to Apply
California	Net Metering and Multifamily Affordable Solar Housing (MASH) Program	Up to 1 MW for residential and local government systems	Local government and residents of affordable housing
Colorado	Net Metering and the Community Solar Garden Act	1) Up to 2 MW for community solar gardens 2) Up to 25 KW for municipal utility customers 3) From 2 MW up to 120 percent of the customer’s annual average electrical consumption for investor-owned systems	Community Solar Gardens, municipal, investor-owned systems
Massachusetts	Net Metering and Neighborhood Net Metering Program	1) 1-2 MW for residential systems 2) Up to 10 MW for municipalities/government entities	Residential and municipal

Who will be the targets for this program?

Primarily local government and residents

How does it affect GHG emissions?

More renewable energy equals less need for fossil fuels.

How can the City of Cincinnati influence the initiation of this program?

Brownfields are located in the region, some of which are owned by the city. The City of Cincinnati could take a leading role in this recommendation by proposing to put solar panels on a Brownfield site and sell the energy produced. Such a proposal could be the focal point for a push for state authorization.

Is it feasible?

Obstacles to achieving this plan include:

- Regulatory approvals
- Billing and consumer management
- Pricing

How much would it cost?

- Marketing and communication

Are there other positive impacts?

- Air Quality
- Jobs
- Reduced installation costs
- Energy is shared between tenants
- Allows for a larger system using less space
- Overcomes building positioning and shading issues

Source: <http://www.everydayenergy.us/virtual-net-metering/>

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): Create agreements with city electric providers and regulators to allow virtual net metering inside city government

Mid-Term (Three to Four Years): Work with Green Umbrella, Ohio USDN to lobby PUCO to include provisions for virtual net metering

Green Cincinnati Plan – Renewable Energy Recommendation Identify and Promote Other Renewable Energy Financing Tools

What is it and why is it important to the City of Cincinnati?

Becoming a leader and innovator in renewable energy is one of the most important steps for Cincinnati to achieve the goal of being a top sustainable city in the U.S. This recommendation identifies possible funding tools, which will help alleviate some of the barriers to renewable energy and help get the resources needed to better promote renewable energy programs.

Some pieces of renewable energy financing were important enough to be called out as individual recommendations, including stabilizing the SREC market, reinstating the Advanced Energy Fund grant program through lobbying the State of Ohio, and virtual net metering.

A complex array of possible financing tools is available for renewable energy projects. These financing tools include:

- Renewable energy property tax exemptions - permits cities and towns to offer exemptions from local property taxes for certain renewable energy installations
- Renewable energy generation incentive program - a rebate program for residential renewable electric generating systems rated less than 5kw generating capacity
- Federal tax credits - a variety of tax credits for residential energy efficiency and renewable energy improvements. The tax credit is a dollar-for-dollar reduction against the income tax due.

The programs and incentives listed below are often part of the package solar installers bring to potential clients.

Renewable energy financing programs

- Moderated accelerated cost-recovery system (MACRS) and bonus depreciation
- Business energy investment tax credit (ITC)
- Renewable electricity production tax credit (PTC)
- U.S. Dept. of Treasury – Renewable Energy Grants
- Clean renewable energy bonds (CREBs)
- Energy efficient mortgages
- Qualified energy conservation bonds (QECBs)
- U.S. Dept. of Energy – Loan guarantee program
- Residential energy conservation subsidy exclusion (personal)
- Commercial solar systems - EPAct incentives provide a credit equal to 30 percent of qualifying expenditures for the purchase and use of commercial solar installations, with no cap on the total credit allowed.
- Home photovoltaic systems - Photovoltaic systems must provide electricity for the residence, and must meet applicable fire and electrical code requirement. The tax credit is for 30 percent of the cost of the system, up to \$2,000. A home owner can take both a 30% credit up to the \$2,000 cap for a photovoltaics system and a 30% credit up to a separate \$2,000 cap for a solar water heating system.

Sources:

<http://www.nh.gov/oep/programs/energy/RenewableEnergyIncentives.htm#local>

<http://www.nh.gov/oep/recovery/index.htm>

<http://www.dsireusa.org/incentives/index.cfm?state=us>

Incentives specific to Ohio:

- Annual State Energy Program – Ohio Dept. of Development
- Energy Loan Fund – Ohio Dept. of Development
- Ohio Advanced Energy Fund – Ohio Dept. of Development
- Clean Air Development & Project Financing
- Ohio Third Frontier Program – Ohio Dept. of Development
- Ohio Volume Cap Program

Source: <http://www.development.ohio.gov/Energy/Incentives/GrantsLoans.htm>

Other financing tools to help turn capital intensive solar projects from a large one-time expenditure to a series of monthly payments more similar to a mortgage or home improvement loan also exist.

- *Hamilton County Home Improvement Program (HIP Loan)*: Loans at 3 percent below market rate, 5 year term
- *ECO-Link State Treasurer of Ohio*: ECO-Link is a partnership between the State Treasurer of Ohio and participating state banks that provides a 3 percent interest rate reduction for five or seven years on bank loans when completing energy-efficient upgrades in your home. Through this program, ECO-Link invests in Ohio's environment and communities while fostering economic growth. The maximum loan amount the interest rate reduction can be applied to is \$50,000. A homeowner can opt for a seven-year rate reduction if the loan is for more than \$25,000.
- *Property Assessed Clean Energy (PACE)*: PACE financing is designed to allow property owners interested in installing energy improvement projects the ability to take advantage of the lower interest rates and longer financing terms associated with public bonds. In effect, PACE allows the bundling of individual private sector energy improvement projects to take advantage of the scale, public backing and capital nature of traditional municipal bonds. PACE for commercial projects has moved forward while residential PACE has been bogged down in the mortgage crisis.
- *On-Bill Financing*: On-bill financing loans are designed to be repaid through regular utility bill payments and typically target residential customers, although certain utilities will allow commercial participation. Each utility has specific energy efficiency products that qualify for these loans, as both gas and electric utilities are program participants. Savings on utility bills help customers make installment payments as part of their monthly utility bills, gradually paying for renewable energy improvements

Who will be the targets for this program?

- Residents and businesses
- Local universities – help identify

How does it affect GHG emissions?

More renewable energy equals less need for fossil fuels.

How can the City of Cincinnati influence the initiation of this program?

The City of Cincinnati can help promote these funding options to current residents and corporations throughout the City. These funding opportunities can also be used as a strategy to attract new corporations or residents to the City. The City can pass commercial PACE legislation.

Is it feasible?

Some obstacles to achieving this plan include:

- Limited funding for number of applicants
- People not aware of funding options

How much would it cost?

- Education and communication of these funding opportunities
- Cost of companies or residents in application process

Are there other positive impacts?

- Air Quality
- Jobs

Are there possible unintended impacts?

Money diverted from other investments

Timeline for Implementation

Short-Term (One to Two Years): Pass Commercial Property Assessed Clean Energy (PACE) ordinance. Develop Solar Rooftops program. Include new tool in 2nd round of aggregation and/or city electric contract. Promote financing tools through Green Umbrella.

Green Cincinnati Plan – Renewable Energy Recommendation

Educate the Public about how the Region’s Electricity has Historically Been Generated and the Transition from Fossil Fuel toward Renewable Energy Generation

What is it and why is it important to the City of Cincinnati?

There is a sense that the general community does not know how the electricity for Greater Cincinnati is generated. With the current major generating sites located at the edge of the region, many citizens do not know that most of our electricity is generated from burning coal.

Duke Energy is required to include environmental disclosure statements in their bills: http://www.duke-energy.com/pdfs/09_12G-EnvrnmtDisclosure.OH-Final.pdf Although this disclosure does identify where Cincinnati’s power comes from, it may not fully convey how Cincinnati’s major generating sites impact the environment and the people living in the surrounding areas. The public should be made aware that a majority of the electricity generated in this region comes from burning coal.

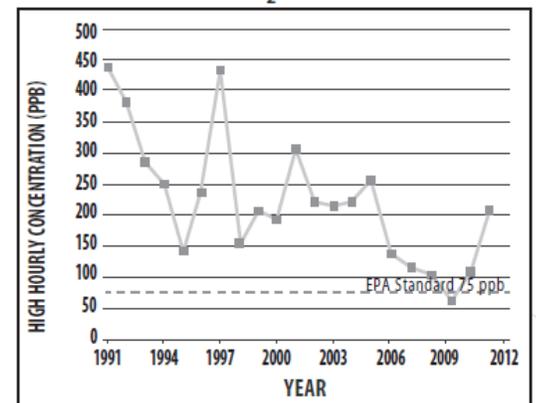
Accounting for where the City’s electricity is generated and making this information more easily understandable for the public is essential. This will help raise awareness around the region about the benefits of investing in renewable energy sources and thus becoming less reliant on burning coal, which has air quality and health impacts. Using renewable energy sources will help create jobs to generate and disperse the energy to local consumers.

Relationship of Ohio’s Air Quality and Energy Generation:

Coal fuels more than half of electricity Americans use in this country, and according to recent environmental disclosure information in 2013, approximately 73% of the region’s electricity will be generated from coal. Many of the ways of generating electricity have environmental impacts. Burning coal generates air emissions and solid waste. Since the formation of the EPA in the 1970s, these emissions have been regulated and significant gains have been made in reducing their impacts. “Scrubbers” and other best available control technologies have lessened the impacts of air emissions like sulfur dioxide and nitrogen oxide (NO_x), a contributor to smog.

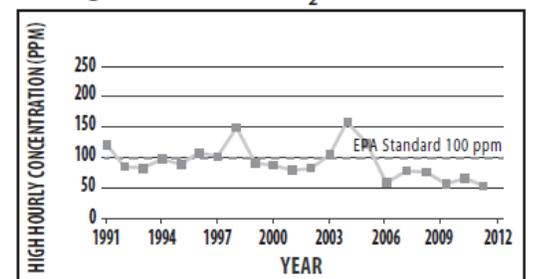
The EPA continues to look at ways to lessen the impact of other parts of the air emissions from burning coal. Regulations to reduce mercury and carbon dioxide emissions have recently been proposed and finalized— notably in 2012 the Mercury & Air Toxics Standards (MATS) and the New Source Performance Standards for greenhouse gas emissions from new coal fired units

Sulfur Dioxide (SO₂)



1 Southwest Ohio Air Quality Agency

Nitrogen Dioxide (NO₂)



2 Southwest Ohio Air Quality Agency

which should be finalized in early 2013. In response to these new regulations and to some extent lower natural gas prices, local utilities have been switching from burning coal to burning natural gas to generate electricity. In many cases, utilities have decided to close older coal fired plants such as Duke Energy’s Beckjord Generating Station.

Below is data listing the coal generating sites in the Cincinnati region, in addition to each site’s plant capacity and tons of CO₂ emissions.

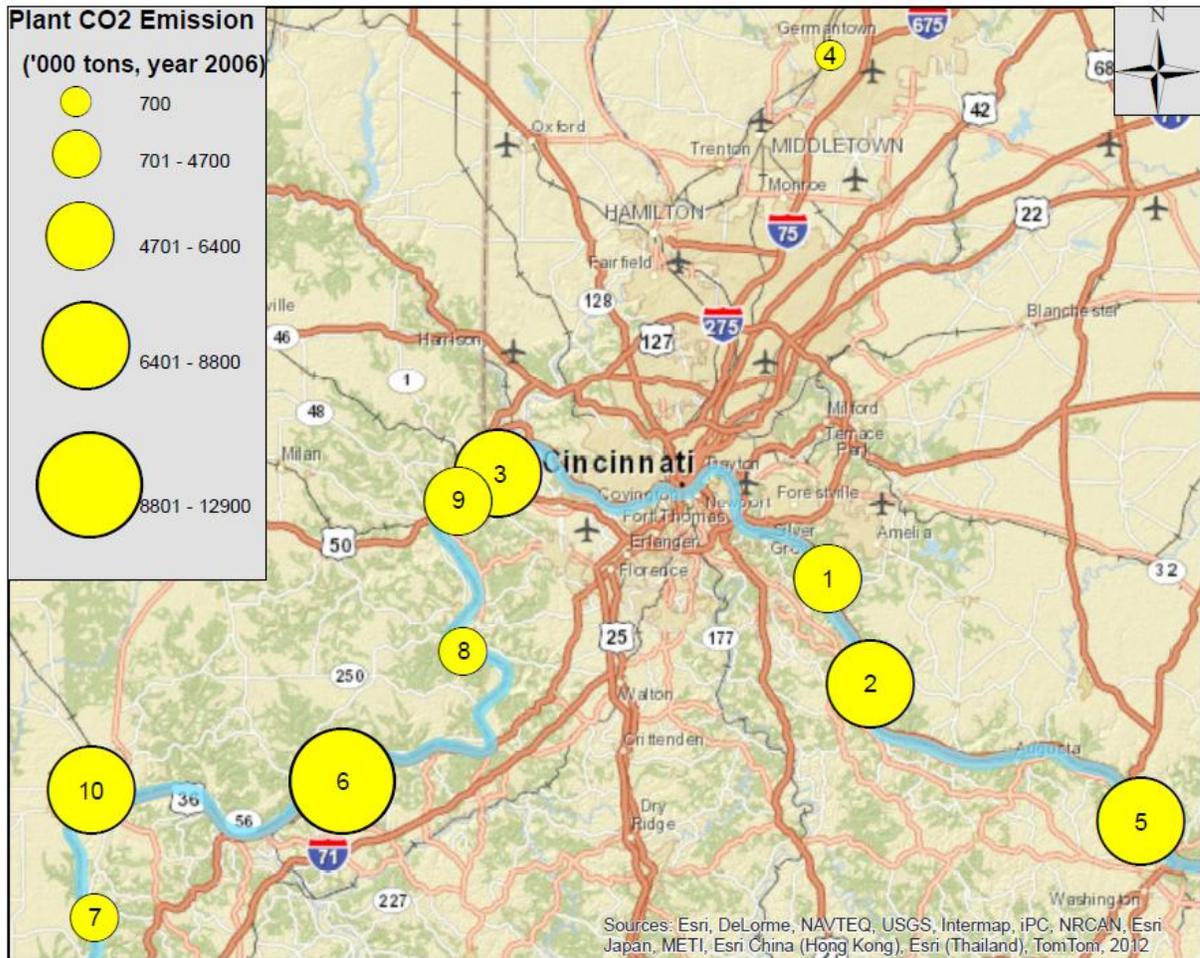
Power Plant	Owner	Plant Nameplate Capacity (MW)	Location	2006 CO ₂ Emissions ('000 tons)	Retirements planned
Beckjord Generating Station	Duke Energy	1,221	New Richmond, Ohio	6400	2015
Zimmer Generating Station	Duke Energy	1,426	Moscow, Ohio	8500	NA
Miami Fort Station	Duke Energy	1,378	North Bend, Ohio	7700	1 of 3 in 2015
Hutchins	Dayton Power & Light	414	Miamisburg Ohio	700	2015 (or switch to natural gas)
Spurlock Power Station	East Kentucky Power Coop	1,279	Maysville, Kentucky	8100	NA
Ghent Generating Station	E.ON AG	2,226	Ghent, Kentucky	12900	NA
Trimble County Generating Station	E.ON AG	566	Bedford, Kentucky	4100	NA
East Bend Generating Station	Duke Energy	669	Rabbit Hash, Kentucky	4700	NA
Tanners Creek Plant	AEP	1,100	Lawrenceburg, Indiana	5600	3 of 4 in 2015
Clifty Creek Station	AEP/First Energy	1,303	Madison, Indiana	8800	NA

Aside from Pittsburgh, Cincinnati is one of the largest metropolitan areas that is proximate to multiple large scale coal fired power plants. When mapped, it is easy to trace the path of the Ohio River where many of these powerplants are located.

According to the EPA, toxic air pollutants from fossil fuel-fired power plants cause serious health impacts. The air pollutants include metals such as mercury, arsenic, chromium and nickel. Other pollutants from fossil fuel fired power plants include precursors to ground

level ozone and fine particulates. New regulations proposed under MATS are estimated to avert up to 11,000 premature deaths, 4,700 heart attacks and 130,000 asthma attacks every year.

Greater Cincinnati Area Power Plants



Map composed by El'ad Mokadi for Cincinnati Office of Environmental Quality February 2013



ID	Station Name	Owner	Location	CO2 Emission ('000 tons)	Nameplate Capacity (MW)
1	Beckjord Generating Station	Duke Energy	New Richmond, OH	6400	1221
2	Zimmer Generating Station	Duke Energy	Moscow, OH	8500	1426
3	Miami Fort Station	Duke Energy	North Bend, OH	7700	1378
4	Hutchins	Dayton Power & Light	Miamisburg, OH	700	414
5	Spurlock Power Station	East Kentucky Power Coop	Maysville, KY	8100	1279
6	Ghent Generating Station	EON AG	Ghent, KY	12900	2226
7	Trimble County Generating Station	EON AG	Bedford, KY	4100	566
8	East Bend Generating Station	Duke Energy	Rabbit Hash, KY	4700	669
9	Tanners Creek Plant	AEP	Lafayette, IN	5600	1100
10	Clifty Creek Station	AEP/First Energy	Madison, IN	8800	1303

Who will be the targets for this recommendation?

The citizens of Cincinnati are the targets for this recommendation.

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati has many lines of communication with residents and businesses. The City can use direct lines of communication through media like the Office of Environmental Quality newsletter and Citicable as well as incorporate messages about the region's coal fired electricity generation in press releases and events around the city's energy programs such as utility aggregation, energy retrofits of city buildings and city solar installations.

The City can work with partners like Green Umbrella and Southwest Ohio Air Quality Agency as well as media outlets like the Enquirer, Business Courier, and Soapbox to help create a better understanding of the nature of electricity generation in our region and the related sustainability impacts.

The City of Cincinnati works with many organizations like Cincinnati Public Schools (CPS), Keep Cincinnati Beautiful (KCB) and the Alliance for Leadership and Interconnection (ALI) to help educate children about environmental issues. Where our power comes from should be an important piece of these education efforts.

Finally, Cincinnati can work with advocacy organizations like the Sierra Club and Ohio Citizen Action. Some of these organizations are already conducting campaigns focused on coal fired power plants.

Is it feasible?

Yes, this recommendation has few impediments. Care should be taken not to politicize this issue and only report facts.

How much would it cost?

There are many no-cost or low cost options to implement this recommendation.

Timeline for Implementation

Short-Term (One to Two Years), Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): Work with partners including Green Umbrella and Greater Cincinnati Environmental Educators to promote awareness about the region's electricity generation.

Green Cincinnati Plan – Renewable Energy Recommendation

Expand Solar Power Purchase Agreement

What is it and why is it important to the City of Cincinnati?

A Solar Power Purchase Agreement (SPPA) is a financial arrangement in which a third-party developer owns, operates, and maintains the photovoltaic (PV) system, and a host customer agrees to site the system on its roof or elsewhere on its property and purchases the system's electric output from the solar services provider for a predetermined period. The City of Cincinnati is using this financial arrangement to receive stable and lower cost electricity. The solar services provider or another party is also acquiring valuable financial benefits such as tax credits and income generated from the sale of electricity. Currently, the City of Cincinnati has 22 buildings with solar panels, leaving the opportunity to expand this great progress in the use of solar energy. This recommendation calls for the City of Cincinnati to expand its solar power purchase agreement. This expanded agreement could include other government entities, such as libraries, transit providers, and affordable housing authorities.

Source: <http://www.epa.gov/greenpower/buygp/solarpower.htm>

In order to expand the solar power purchase agreement and work towards a solar community, the City of Cincinnati can use the following organizational strategy to put a plan in place:

- Create a solar advisory committee or task force
- Hire or designate a local solar coordinator
- Survey residents and businesses to identify barriers
- Conduct an installation survey
- Establish solar installation targets
- Include solar in broader city, county and regional planning efforts

By using these outlined steps as a model, the City of Cincinnati will be able to efficiently identify where to get the additional solar power and what other government entities and facilities can use this additional solar power.

Strategies to Utilizing the Expanded Solar Power Purchase Agreement:

One trend in the solar market, which may be useful to the City of Cincinnati, is hosting wholesale power generators on local government land or facilities. As solar markets grow, many utilities are increasing their investments in solar energy, either by constructing their own solar generation facilities or purchasing wholesale solar energy from power plants constructed by third parties.

Marginal land or rooftop space on low-load buildings (such as brownfields, road right-of-ways, barriers around wastewater treatment plants, or roofs of low-load buildings such as warehouses or transit centers) can make excellent sites for solar energy installations. Local governments can partner with solar developers or utilities to use municipal land or

rooftops for solar power generation. The benefit of this strategy is that local governments own land and facilities in close proximity to electricity load centers, making these locations good hosts for urban power plants. By having the wholesale power generators on local government land or facilities, the City has flexibility to choose how to use the solar energy produced by the generators.

Using marginal land or rooftop space has several additional advantages:

- Source of revenue stream for local governments
- Power is generated close to usage, minimizing losses over transmission lines and strengthening the grid
- Help minimize the impacts associated with locating new power plants.

Source: http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf

Another trend is in the increasingly hot market segment of mid-sized solar plants (under 25 megawatts), because these modular systems have enough scale to produce power at attractive prices. These systems are also small enough to interconnect to the existing distribution network and can come on-line quickly.

Case Study: College Hill Recreation Center

The College Hill Recreation Center is now complete with its new system, which includes 672 solar panels installed on the roof of the gym. The 158 kilowatt (kW) system is expected to produce 180,000 kilowatt hours (kWh) per year, which is enough energy to power 16 average homes for a year.

The solar power system on the College Hill Recreation Center is the first project resulting from the City's solar power purchase agreement with the Sun Team. Under the agreement, the Sun Team installs a solar power system at no cost to the City, and the City agrees to buy the energy produced at a price that starts slightly below the current market rate, and stays low for the entire 20-year term of the contract, eliminating the volatility of the traditional utility market.

The partnership with the Sun Team builds on the City's previous successful solar power projects, including the Duke Energy Convention Center, Findlay Market, the Metropolitan Sewer District building, and the City's largest solar panel system at Water Works. The Parks Department's renewable energy program has also installed solar panels at 13 different facilities. Source: <http://www.cincinnati-oh.gov/mayor/news/solar-panels-on-college-hill-rec-center/>

Who will be the targets for this program?

The City is evaluating many of its facilities and properties for installation of solar panels through the SPPA. The implementation of this chapter's virtual net metering recommendation would increase the number of sites where the application of solar would be economically feasible.

The City can also pass along the success of SPPA to other government and quasigovernment entities in Cincinnati that have buildings or property that are well suited for an SPPA arrangement. Some of these larger entities include: Metro, Hamilton County, Cincinnati Metropolitan Housing Authority, and the Public Library of Cincinnati and Hamilton County.

How does it affect GHG emissions?

In the Green Cincinnati Plan (2008) the City set a goal to reduce 50 tons of CO₂/year through solar photovoltaic installations by 2012 and 10,000 tons/year by 2028. By the end of 2012, the City had 1.12 MW of solar installed which equates to 1,274 MWh/year or approximately 1,274 tons of CO₂/year.

How can the City of Cincinnati influence the initiation of this program?

The City of Cincinnati can develop a strategic plan based on the model specified in this recommendation to identify where to get the additional solar power and what facilities can use this additional solar power.

Who are the potential partners to achieving this recommendation?

- Metro
- Cincinnati Public Schools
- Local Businesses
- Municipal/Government Buildings
- Local Universities (Emerging Technologies and Trends)

Is it feasible?

Yes, but there are some obstacles to achieving this plan:

- More complex negotiations and potentially higher transaction costs than buying PV system outright
- Negotiating price
- Matching demand with amount purchased
- Determining locations of solar power
- Virtual Net Metering

How much would it cost?

Limited cost except for staff time to craft legal language in tailored SPPAs.

City needs to hire someone who can explain the program/initiative to people and spearhead the effort to expand SPPA usage.

Are there other positive impacts and what are the challenges?

Benefits for host customer:

- No upfront capital cost
- Predictable energy pricing
- No system performance or operating risk
- Projects can be cash flow positive from day one
- Visibly demonstrable environmental commitment

- Potential to make claims about being solar powered (if associated RECs are retained)
- Potential reduction in carbon footprint (if associated RECs are retained)
- Potential increase in property value
- Support for local economy and job creation

Challenges for host customer:

- More complex negotiations and potentially higher transaction costs than buying PV system outright.
- Administrative cost of paying two separate electricity bills if system does not meet 100 percent of site's electric load.
- Potential increase in property taxes if property value is reassessed.
- Site lease may limit ability to make changes to property that would affect PV system performance or access to the system.
- Understand trade-offs related to REC ownership/sale.

Source: <http://www.lesusacanada.org/docs/chapter-presentations/svc2-24-10.pdf>

Are there possible unintended impacts?

Installations may uncover additional construction issues.

Timeline for Implementation

Short-Term (One to Two Years): Share SPPA with City related institutions like Metro, CMHA, CPS, Libraries

Mid-Term (Three to Four Years): Share SPPA with other institutions like Hamilton County and OKI

Long-Term (Five to Six Years): Work with Green Umbrella, Ohio USDN push for more solar in building code

Green Cincinnati Plan – Renewable Energy Recommendation

Anaerobic Digestion

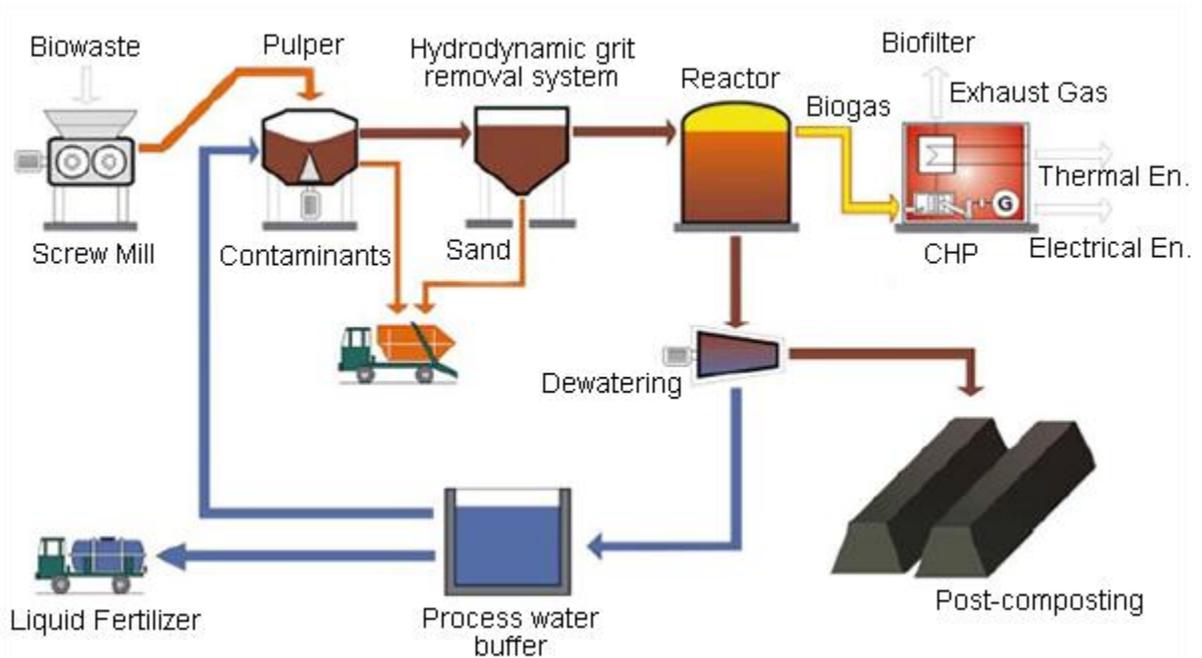
What is it and why is it important to the City of Cincinnati?

Anaerobic digestion facilities offer the City an opportunity to divert waste from landfills, reduce methane emissions, and tap into a renewable energy source. Biogas (methane – aka natural gas) can replace the natural gas from subsurface deposits and be used to generate electricity and heat buildings. In recent years, anaerobic digesters have increasingly been used nationwide to convert local organic wastes into energy. This recommendation focuses on creating access and support for anaerobic digestion facilities which help increase energy and cost savings around Cincinnati, and reduce the City's waste.

Anaerobic digestion is a biological process in which organic materials such as grease, food waste, manure, municipal wastewater, and personal care products are converted into biogas (methane). The waste is locked into an oxygen-free facility; allowing bacteria to break down materials and the energy plant to capture the gases emitted.

Below is a chart which depicts how anaerobic digestion produces energy. Cincinnati should work to support programs that would attract anaerobic digestion facilities to the City.

Source: <http://www.epa.gov/region9/organics/ad/benefits.html>



Food waste today accounts for 18% of the waste in landfills and has three times the methane production potential of biosolids. Through anaerobic digestion this methane is diverted from landfills and the heat and energy generated from the organic materials becomes a renewable energy source. Anaerobic digestion also produces a solid residual which can be used for compost, fertilizer, and bedding materials. This will help the City become less reliant on fossil fuels and also bring green jobs to the City. If the City of

Cincinnati wants to create a sustainable market for renewable energy, green jobs, and local resources it needs to support financing options that attract this type of business.

Case Study: Quasar Energy Group

Cleveland, OH: The Cleveland-based Quasar Energy Group has experienced success in energy production through their anaerobic digestion facilities. Their facility in Cleveland's Collinwood neighborhood produces enough energy to power 582 homes or compressed natural gas to fuel 838 cars per year. Demand coming from partnerships with regional businesses and universities, like Pierre's Ice Cream, local hog farms, and the Ohio State University has prompted Quasar to expand its number of facilities from 10 to 23, with plans for two dozen more in the pipeline. The City of Cincinnati does not have an anaerobic digestion facility; however, support for initiatives such as PACE financing and a fleet vehicles which run on compressed natural gas makes Cincinnati attractive to companies such as Quasar.

Who will be the targets for this recommendation?

CompostCincy is a partner that could benefit from the soil residuals and food waste collection that comes from the installment of an anaerobic digestion facility. The City's fleet would also benefit from the compressed natural gas generated by a facility, expanding the number of vehicles in the City that run on alternative fuel.

How does it affect GHG emissions?

More renewable energy equals less need for fossil fuels.

How can the City of Cincinnati influence the initiation of this program?

The City of Cincinnati can provide financing options that incentivize programs which decrease GHG emissions and supply renewable energy. The City can also supply a market for anaerobic digestion facilities by using the renewable energy on City owned vehicles and properties.

Is it feasible?

Obstacles to achieving this plan include:

- The City needs to providing an attractive market
- City should needs to support alternative financing options such as PACE that allows commercial projects to take advantage of public bonds.
- Possible resistance from Rumpke stemming from a decrease in waste

How much would it cost?

- ????

Are there other positive impacts?

- Reduces methane emissions
- Jobs
-

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years):

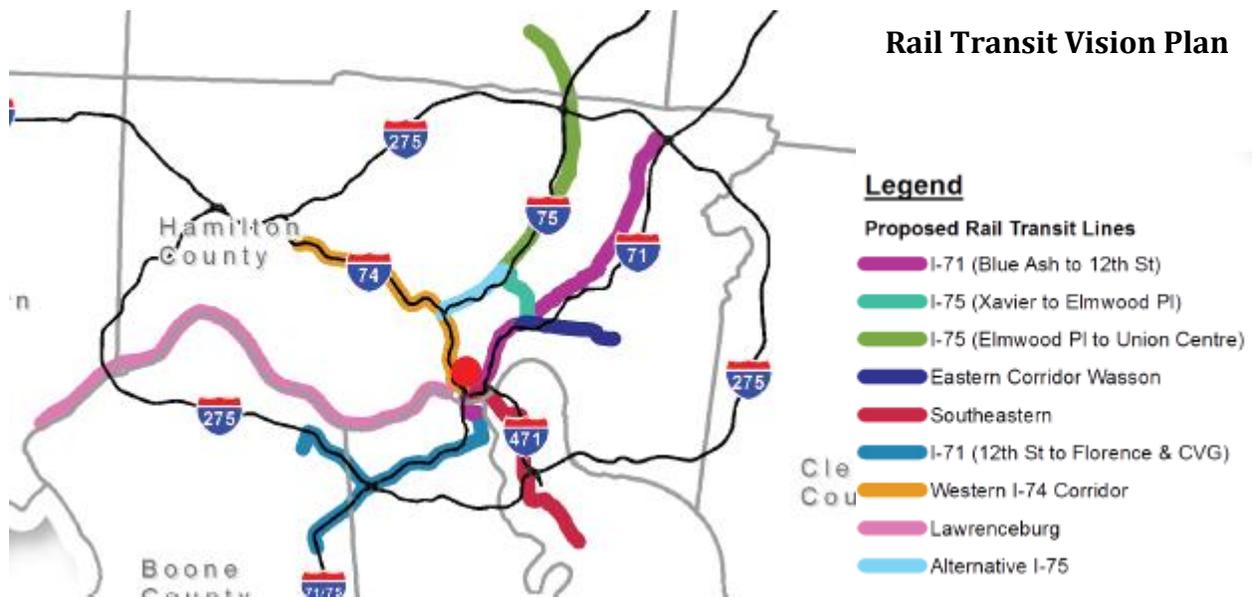
Mid-Term (Three to Four Years):

Green Cincinnati Plan – Transportation Recommendation Develop and Implement Regional Transit Plan

What is it and why is it important to the City of Cincinnati?

Most of the City of Cincinnati was built on a framework of transit. Dense mixed use centers surrounded by single family neighborhoods are the bones of our City. The dense development downtown would not be possible without a transit system that can help minimize the need for oceans of parking lots and expensive parking structures. Areas, such as Uptown, struggle with congestion and parking issues that limit the ability of institutions like Children’s Hospital and University of Cincinnati to expand. A more robust transit system could help these areas flourish.

With a three- state region and transit system funding in Ohio based on a county basis, developing a regional transit plan - both for short term operations and long term capital improvements - has been difficult. A series of planning efforts from the individual systems have met with varied levels of success. The Ohio, Kentucky, Indiana Council of Governments (OKI); the Metropolitan Planning Organization for the region; has incorporated some of these individual system plans into their federally mandated Long Range Transportation Plan (LRTP). The OKI 2040 Regional Transportation Plan includes the Cincinnati Streetcar, a handful of Bus Rapid Transit Lines, the Eastern Corridor Oasis Rail Alignment, and an Ohio Hub Passenger Rail/Midwest Regional Rail Cincinnati Terminal. The plan also includes a Rail Transit Vision Plan and calls for associated rail right-of-way preservation projects but actual implementation is not recommended in the 2040 timeframe. To meet the greenhouse gas reduction and other sustainability goals in this plan, a comprehensive regional transit plan must be implemented by 2040.



A variety of entities are accountable for implementing the capital improvements of the region’s transit system and the path for implementing the other aspects of the Rail Transit Vision Plan remains unclear. The Green Cincinnati Plan recommends that a “Super

Committee” like the committee created for the implementation of the Brent Spence Bridge Replacement Project, be created to develop a regional transportation plan and implementation strategy that can be incorporated into the OKI LRTP and appropriate transit agency plans.

In June 2002, Metro released a Regional Transit Plan entitled MetroMoves that proposed expanding the bus system to serve all of Hamilton County and implementing a regional rail plan. Transit Authority of Northern Kentucky (TANK) initiated a transit network study in 2006 to assess the effectiveness of its current operations and establish short and long-term plans. In 2007, Clermont Transportation Connection (CTC) created a strategic development plan with goals to improve transportation options to county residents, maximize existing resources through more efficient operations, reduce peak hour demand for roads and highways, and to increase transportation options for zero car households and persons with disabilities. All three transit plans call for significant improvements to the existing transit network. Identified needs and recommendations for bus transit include new service routes, application of enhanced technology or ITS, development of Bus Rapid Transit on appropriate routes, and the introduction of new bus transit related facilities. Source: http://www.oki.org/departments/transportation/pdf/2040plan/finalchapters/ch10_publictransportation.pdf

The Regional Transit Plan should include all modes of transit, should enable people to move smoothly throughout the region without a car, and should include a regional funding mechanism that is on a par with the need.

Who will take leading roles in implementing this recommendation?

- The City of Cincinnati
- Metro
- OKI
- Other transit agencies - CTC, TANK, etc.
- Agenda 360/Vision 2015
- Green Umbrella
- Chamber of Commerce
- Departments of Transportation - ODOT, IDOT, KYTC
- Hamilton County TID
- Cincinnati Business Committee (CBC)
- V Ride

How does it affect GHG emissions?

Transit means more people per vehicle and less GHG emissions and it provides significant secondary impacts such as impacts on land use. It also supports dense active areas because of decreased parking space, and it helps eliminate the need for expensive parking structures.

Estimated annual GHG emission reduction?

Shifting travel modes to transit saves significant greenhouse gas emissions. See introduction for detail about transit's impact. If the Cincinnati region achieves its goal of reducing gas and diesel usage by 20% by 2020, it will reduce greenhouse gas emissions by tons of CO₂ per year.

How can the City of Cincinnati influence the initiation of these programs?

Transit is a key aspect that supports the dense employment centers of downtown and uptown and transit is part of a way to live a low greenhouse gas lifestyle. The City's investment in the streetcar project and the use of the city's earnings tax at three tenths of one percent makes the City the largest local funder of transit in the region. Because the City's Department of Transportation and Engineering (DOT&E) is a key driver of regional transit planning and implementation, its expertise should be utilized.

Is it feasible?

Organizing all the parties involved to work collaboratively is a major obstacle.

How much would it cost?

The cost of implementation could be in the billions of dollars and even the planning will cost millions of dollars.

Are there other positive impacts?

- Land Use/development patterns
- Air Quality
- Less parking spaces
- Provides mobility for those who cannot afford, choose not to own a car, or are unable to drive
- Potentially helps with diversity and inclusion
- Less roads and parking lots equals less impermeable surfaces and better water quality
- Health impacts on people

Are there possible unintended impacts?

- Congestion
- Shifting resources from other initiatives

Timeline for Implementation

Short-Term (One to Two Years): The City of Cincinnati supports Metro's unveiling of the Metro "Way to Go" Plan in the Spring of 2013.

The City will partner with OKI, Green Umbrella, Metro, The Chamber of Commerce, etc. to create a Regional Transit "Super Committee" by Fall of 2013.

Mid-Term (Three to Four Years): The City will partner with OKI, Green Umbrella, Metro, etc. to complete the Regional Transit Plan by Fall of 2015.

The City will partner with OKI to have the Regional Transit Plan recommendations adopted into OKI LRTP Fall 2016.

Long-Term (Five to Six Years): The City will partner with Metro on the first capital project beginning in 2017.

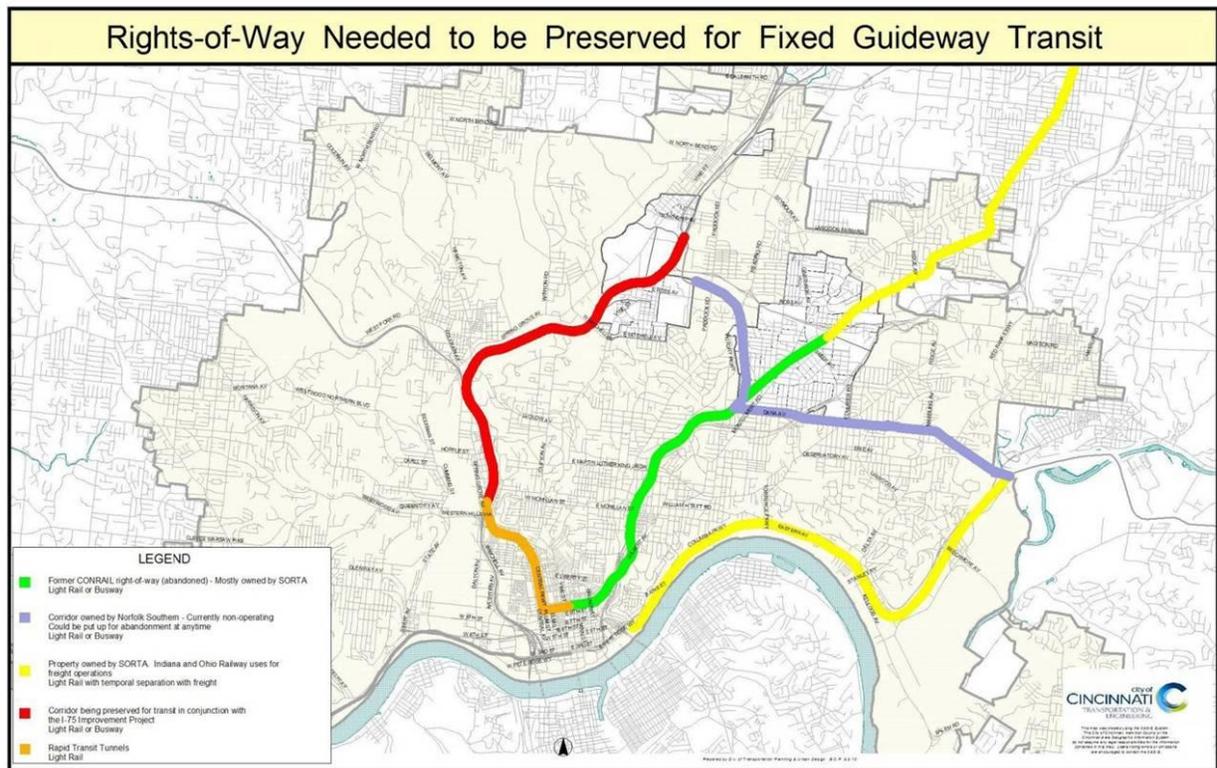
Green Cincinnati Plan – Transportation Recommendation

Preserve Right-of-Way for Transit Improvements

What is it and why is it important to the City of Cincinnati?

By the year 2020, the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) estimates that significant portions of Greater Cincinnati's regional freeway system will have failed in their mission to move people and goods. Traffic on some freeway segments will be crawling at a snail's pace for several hours of the day. In order to plan for the future, the City of Cincinnati needs to increase its efforts to preserve the right-of-way for transit improvements to ensure access to key transit development corridors. Source: <http://www.protransit.com/Default.asp>

In the future, rail transit could be a viable solution to the transportation challenges in the City and region. To maintain the ability to implement rail transit, it is recommended that rights of way be preserved. In the Cincinnati area, there are currently no rights of ways that have been posted for abandonment by the Surface Transportation Board (STB). However, there is a possibility that two Norfolk Southern owned rail lines could be abandoned in the near future.



Abandoned railroad rights of way should be preserved and prioritized in the following ways:

- Continued freight service if applicable by a short line railroad such as Indiana and Ohio
- Intercity passenger rail or commuter rail (Federal Railroad Administration) compliant.

- Rail transit (light rail)
- Bicycle trails

An example of how abandoned rights of way may be used is the “Wasson Alignment.” The Wasson alignment provides a connection between the I-71 and eastern alignment. This plan is consistent with the recommendations from the Eastern Corridor Study to preserve the right of way along the existing rail line between Xavier University and the Village of Fairfax. This route would include connection to the I-71 rail transit alignment.

Source: http://www.oki.org/departments/transportation/pdf/2030plan/Chapter_09.pdf

The Wasson Way Project is a vision to convert 6.5 miles of the Wasson Alignment into a recreational hiking and biking trail which would extend from the Little Miami Bike Trail in Newtown through the communities of Hyde Park, Oakley, Mariemont and several others.

Source: <http://news.cincinnati.com/article/C2/20120830/NEWS/308300055>

How can the City of Cincinnati influence initiation of this recommendation?

In addition to existing railroad rights of way, the City’s DOTE has taken the lead on the preservation of rail corridors along the I-71 and I-75 corridors as part of planning and design projects. Two additional pieces of existing infrastructure could be used in future light rail transit corridors:

Rapid Transit Tubes (Cincinnati Subway)

The rapid transit tubes were intended to be part of a rapid transit system like those in New York City and Chicago. They were constructed in the 1920s. The rapid transit project was eventually cancelled due to a lack of funding. The tubes run beneath Central Parkway. They act as bridge supports for the road above. Therefore they must be maintained by DOTE’s Structures Section. The Cincinnati Water Works has a 48-inch water main in one of the tubes. DOTE’s Transportation Planning Section recently conducted a feasibility study to determine whether the rapid transit tubes could be used for modern light rail transit (LRT). The study determined that they could be used for LRT.

Riverfront Transit Center

The riverfront transit center (RTC) was constructed beneath Second Street for various on-going and special events. For instance, during Reds and Bengals games, the RTC is used for the parking of transit buses, tour buses, school buses, and 12-passenger vans (minimum size vehicle). The RTC is also used for special events such as the World Choir Games. The RTC was designed to be adapted to provide connections between conventional bus transit and rail transit.

Is it feasible?

Potential obstacles to this recommendation could include:

- Cost of preservation
- Land may be owned by entities other than the City
- Alternative uses of these areas

How much would it cost?

It can be expensive to develop and expand transportation infrastructure, especially in urban areas because of the cost of right of way acquisitions. However, the cost to preserve existing rights of way are much lower.

Are there other positive impacts?

- Jobs
- Development

Are there possible unintended impacts?

No.

Timeline for Implementation

Short-Term (One to Two Years): The City will take the lead on the Wasson Line Interim Development Control (IDC) Overlay District and complete Wasson Line Land Use Study (P&B).

Mid-Term (Three to Four Years): The City will take the lead on purchasing the Wasson Line.

Green Cincinnati Plan – Transportation Recommendation

Implement Short-Term Transit Plans

What is it and why is it important to the City of Cincinnati?

Several transit improvements are slated to be implemented within the next two years. The streetcar and the Metro*Plus, a pilot project to introduce the region to bus rapid transit (BRT), are key improvements that will come online in the near term. Metro’s Way to Go plan outlines other short term improvements including two new or expanded cross-town routes and the introduction of the Uptown Transit District. The Uptown Transit District will include new bus hubs and circulator routes to serve the high concentration of employees and students in this area.

The City is moving forward on the Streetcar project. The project achieved significant milestones in 2012 when final design for the project was completed, a contract was signed to purchase the streetcar vehicles and the City purchased a site near Findlay Market to house the vehicles.

Who will take leading roles in implementing this recommendation?

- The City of Cincinnati
- Metro

How does it affect GHG emissions?

Transit means more people per vehicle and less GHG emissions, and it provides significant secondary reductions in emissions due to impacts on land use. It also supports dense active areas because it promotes active transportation and often reduces the need for parking and cars.

Estimated annual GHG emission reduction?

Shifting travel modes to transit saves significant greenhouse gas emissions. The streetcar has been estimated to reduce greenhouse gas emissions by 4,300 tons of CO₂ per year when it is completed, and 28,068 tons per year by 2028. Source: Green Cincinnati Plan (2008). See introduction for detail about transit’s impact.

How can the City of Cincinnati influence the initiation of these programs?

Transit is a key aspect that supports the dense employment centers of downtown and uptown and transit is part of the way to live a low greenhouse gas lifestyle. The City’s investment in the streetcar project and the use of the city’s earnings tax at three tenths of one percent makes the City the largest local funder of transit in the region. Because the City’s Department of Transportation and Engineering (DOT&E) is a key driver of regional transit planning and implementation, its expertise should be utilized.

Is it feasible?

A potential obstacle to this plan is:

- Encouraging residents who aren’t used to taking public transit to take advantage of these new transportation options

How much would it cost?

- The streetcar is estimated to cost \$125.4 million
- Metro's Uptown Transit District is estimated to cost \$6.9 million

Are there other positive impacts?

- Greater accessibility to transit options for residents
- Mobility impact for seniors, disabled, etc.

Are there possible unintended impacts?

Funding used on these projects will not be available for other projects.

Timeline for Implementation

Short-Term (One to Two Years): The City will take the lead on building a street car.

The City will support Metro in implementing Metro*Plus and uptown transit district routes.

Short-Term, Mid-Term and Long-Term: The City will support Metro in expanding the Greater Cincinnati Bus Rapid Transit.

Green Cincinnati Plan – Transportation Recommendation

Continue Implementation of City’s Bike Plan

What is it and why is it important to the City of Cincinnati?

The citizens of Cincinnati are interested in “green” and healthy lifestyles, economical transportation options, and creating sustainable and vibrant communities. To help reach these goals, the city needs to be committed to facilitating and promoting bicycle use as a safe, convenient and comfortable form of transportation and recreation. This recommendation will chart a course for integrating bicycle facilities into our existing street system. The vision of the Cincinnati Bicycle Transportation Plan is to double the number of people bicycling regularly for transportation, while at the same time reducing the rate of crashes and severity of injuries and maintaining the existing low rate of fatalities by 2015.

Cincinnati has the potential to be a city where thousands of people ride bicycles every day. It has many bicycle-friendly features upon which to build an even more extensive bicycling system. These include an emerging riverfront park; Ohio River Trail and Mill Creek Greenway Trail; redevelopment and repopulation of the residential communities in and near downtown; dense employment in Uptown university and hospital districts; and many mixed use neighborhoods. Bicycling can connect residents to shopping and restaurants in neighborhood business districts; schools; parks; recreation centers; and other local destinations. Moreover, a significant portion of Cincinnati residents do not own cars and are dependent on transit, walking, and/or bicycling for daily transportation.

Cincinnati’s street network carries the greatest potential to facilitate bicycling for transportation. For this reason, the Bike Plan should continue to look primarily at the city’s roadways. While not ignoring the need for off-road bicycle accommodations, the goal of this plan is to determine how to make the City’s streets safer and more attractive to cyclists.

There are several strategies the City can use to make streets safer and more attractive to cyclists.

- Adding speed bumps or roundabouts to high bicycle traffic areas to slow cars without stopping them could help decrease the number of accidents as cars will have better control at slower speeds. Arterial roads are some of the most dangerous roads for bicyclists. Protected bike lanes would give bicyclists more safety on these roads or bike trails near these roads would allow bicyclists an alternative route.
- Education among bicyclists and drivers is also essential to ensuring safety on the roads. Often people don’t understand the rules of sharing the road with bicycles and cars. It is important to make sure people are aware of their responsibilities and aware of other drivers/bicyclists on the roads.
- Leveling out the topography could help attract bicyclists to the streets by making commutes less strenuous. This could be accomplished through pedestrian/bicyclist inclines.
- When the City designs or reconstructs roads there must be bicycle friendly features incorporated into the road plans. Implementing a bicycle friendly road is more effective

and efficient during the planning process, rather than trying to implement these features after the roadways are already built and being used.

The City of Cincinnati currently has a Bicycle Transportation Plan. It is important to continue achieving the goals set by this plans and to facilitate more improvements in the city’s network of bicycling routes. Currently the City is in Phase 1 of the plan, which recommends 103 miles of on-street and off-street facilities to be developed between 2010 and 2015. There has been progress in Phase 1. The table below shows the goals for Phase 1 of the plan:

<http://www.cincinnati-oh.gov/bikes/linkservid/DB6EA3D5-ED05-6CC1-0B0246EFE1EAD6D5/showMeta/0/>

Facility	Pre-2010 Miles	Miles Installed 2010	Miles Installed 2011	Miles Installed 2012	Total Since Plan Adoption	Phase Goal
Bike Lanes	5.4	1.9	0.9	3.1	6.0	4
Sharrows	1.8	0.4	2.7	1.3	4.4	2
Climbing Lanes	0	0	0.8	.6	1.4	9
Paved Shoulder	0	0	0	0	0	1
Cycle Track	0	0	0	0	0	1
Bike Boulevard	0	0	0	0	0	
Wide Outside Lane	6.1	0	0	0	0	
Connecting Street	0	0	0	0	0	5
Under Study	0	0	0	0	0	
Further Study	0	0	0	0	0	3
Total	13.3	2.3	4.5	5.0	11.8	1

The 2011 Report Card on biking in Cincinnati can be found here:

<http://www.cincinnati-oh.gov/bikes/linkservid/DB6EA3D5-ED05-6CC1-0B0246EFE1EAD6D5/showMeta/0/>

Source: Bicycle Transportation Program Update 12/19/2012 Council Memo #2526

Who will lead the implementation of this recommendation?

- The City (DOTE) will lead implementation of the Bicycle Transportation Plan
- Queen City Bike will support DOTE and encourage accelerated implementation

How does it affect GHG emissions?

Biking is one way to reduce the GHG impacts of transportation. For the overall impact please see the introduction of this chapter.

How can the City of Cincinnati influence the implementation of this plan?

There are key actions the City of Cincinnati can do to help the continued implementation of this plan including:

- Provide an attractive and functional network of bicycle infrastructure.
- Support programs and initiatives that encourage bicycling for its health, recreation, transportation, economic, and environmental benefits
- Improve bicycle safety through enforcement, education, and engineering initiatives
- Foster public attitudes toward bicycling to include mutual respect among motorists and bicyclists and a general perception of bicycling as a safe mode of transportation and recreation
- Adopt city policies and create institutional structure to implement the Bike Plan goals and objectives and evaluate progress toward achieving its goals

Is it feasible?

Potential obstacles to this plan could include:

- People uncomfortable biking in traffic
- Resistance to loss of parking or vehicle lanes
- People discouraged by lack of designated biking space throughout city
- Unsafe pavement conditions
- Time saved by not biking

How much would it cost?

- Educational programs for biking safety
- Land, labor and building material to construct the bicycling network

Are there other positive impacts?

- Traffic Relief – less congestion
- Health Benefits - According to the CDC, 27.5 percent of Cincinnatians are obese and an additional 33.5 percent are considered overweight, making 61% of Cincinnatians at increased risk to suffer from debilitating and deadly diseases
- Economic Benefits - After housing, transportation is the second-highest household expense for most families. Opportunity to bike can reduce household transportation expenses, freeing up money for other things.
- Air quality
- Potential time benefits (easier to pull up in front of a destination than parking a car in a multi-level parking structure)

Are there possible unintended impacts?

- Increase in bicycle related traffic accidents

Timeline for Implementation

Short-Term (One to Two Years): The City's DOTE will take the lead to continue implementing the bike sharing program and constructing new bike lanes.

Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): The City's DOTE will take the lead on continuing to implement additional bike lanes and expand bike sharing programs as specified in this recommendation.

Green Cincinnati Plan – Transportation Recommendation

Best in Class Commuter Biking Plan

What is it and why is it important to the City of Cincinnati?

The commute between work and home is a normal occurrence for most Cincinnati residents. There are several modes of transportation used by residents to reach their place of employment. More people should utilize the cost efficient, healthy, and environmentally friendly option of bicycling. The estimated number of people who commuted to work by bicycle from 2008 to 2010 was 1,429 or 0.2 percent. These statistics show a small portion of Cincinnatians bicycle to work. Cincinnati has been working to become a more bike friendly community and increase the number of people bicycling to work.

For distances of five miles or less, bicycling is a practical and cheap alternative mode of transportation. According to the Network of Employers for Traffic Safety (NETS), employees who have a high concern for protecting the environment, improving physical fitness or already cycle for recreation are often willing to commute an even greater distance of up to ten miles. Although there is a group of bicycle enthusiasts who already utilize this mode of transportation, there is also a large group of untapped residents who would bike to work if there was more incentive and organized programs from employers. This campaign for a commuter bicycle program would help promote the bicycling option to this group of residents and provide recommendations to companies for how to increase the incentives for bicycling to work.

Who will be the targets for this program?

This program targets organizations within the Cincinnati area to promote commuter bicycling programs within the organization. The organizations should communicate the benefits and incentives provided by the company to all employees in order to convince the greatest number of employees to participate.

Research will need to be conducted on whether it would be more beneficial to narrow the focus of the program on the largest employers in the area or to target any employers interested. In addition, the area in which the initial launch will occur should be decided between uptown and downtown.

Organizations wishing to implement a bicycle commuter program can use local organizations as sources of information to help promote the program. Some of the major advocacy groups include:

- Queen City Bike
- The Cincinnati Cycle Club
- OKI
- The Cincinnati Off Road Alliance
- The Mobo Bicycle Cooperative

Estimated annual GHG emission reduction?

Bike commuting is one way to reduce the GHG impacts of commuting. For the overall impact please see the introduction of this chapter.

What are the steps for an employer to support a bicycling commuter program?

There are many strategies an employer can use to set up a bicycle commuter program. NETS has devised a list of the more influential strategies employers use in order to incentivize employees to commute to work by bicycle:

- *Appoint a bike coordinator*

The Coordinator functions as a liaison between employee cyclists and company management. With assistance from a local bike shop, bicycle club or a local bicycle advocacy group, the coordinator can evaluate facilities and identify safe routes to the work place.

- *Establish a bike users group*

A bike users group can serve as a forum where cyclists can exchange information on the best routes and help promote cycling throughout the organization.

- *Find out about cycling conditions near the work facility*

The organization should contact the City of Cincinnati or county planning agency, transportation department, and local law enforcement to determine if the streets surrounding its work facility are bicycle compatible.

- *Help employees plan safe routes to work*

Placing a link to a map of safe bicycling routes on the company intranet will help employees plan a route. The Pedestrian and Bicycle Information Center at www.bicyclinginfo.org/bikemore/map.cfm has a databank of bike maps for cities, counties and trails organized by state where this information can be found.

- *Setup a mentor or "bike buddy" program*

Linking novice cyclists with experienced cyclists can be beneficial in feeling more comfortable commuting to work by bicycle. The Pedestrian and Bicycle Information Center at www.bicyclinginfo.org/bikemore/support.cfm has links to various bicycle mentor programs.

- *Demonstrate company support for commuter bike program - free "starter kit"*

The kit, given to all bicycle commuters, can include tips on safe cycling, reflective stickers, a water bottle, and a local bike map.

- *Provide bicycle education for all employees*

Post safety and promotional materials regarding bicycling practices, incentives to bicycling commuting, and promotional activities around the workplace. Provide training on bicycle safety for employees.

- *Provide free or low-cost bicycle helmets*

Providing free or low-cost bicycle helmets is a great way to promote safe cycling practices among employees. The organization can buy helmets in bulk and give the helmets to employees in the bicycle commuter program or provide the helmets at a low cost.

- *Provide loaner bicycles to employees*

Purchase loaner bicycles in order to allow employees a trial attempt of commuting by bicycle to work. Providing an employee with a loaner bicycle to test commuting to work will help incentivize the employee to inquire about participating in this program because

the financial commitment of purchasing a bicycle is postponed until the employee is sure this mode of transportation is a good fit.

- *Provide visible, secure and accessible bicycle parking*

Providing secure bicycle parking for employees will help eliminate the stress of finding a place to store their bicycle while at work and also help the employees feel comfortable about whether their bicycle will be protected during the work day.

- *Provide showers and changing facilities*

NETS recommends buildings with 50-100 employees have one shower be available. In buildings with 100- 250 employees, one shower for each sex should be provided. Buildings housing over 250 employees should provide at least four showers. If it is not possible to have showers within the workplace facility, an arrangement could be made for employees to use a local fitness facility.

- *Offer incentives to employees cycling to work*

There are many methods to incentivize employees to cycle to work and each company must find the methods to motivate its own employees; however, NETS suggests implementing some of the following strategies:

- Paying a subsidy to bicycle commuters who don't use company parking spaces
- Offering interest free bicycle purchase loans
- Provide a guaranteed ride home program if the employee needs to get home for an unexpected emergency. Depending on the size and assets of the organization, bicycle commuters may borrow a company car or have their cab fare reimbursed.
- Vanpool/carpool vehicles equipped with bicycle racks
 - If the organization operates vans and pool cars, consider equipping them with bike racks to facilitate commuting by bicycle to work for at least a portion of the commute.

Source: <http://trafficsafety.org/safety/sharing/bike/bike-strategies/implement-a-bicycle-commuter-program>

Is it feasible?

Potential obstacles to this biking plan could include:

- Companies may not want to invest in this program
- Small companies may not have the resources to provide strong enough incentives to employees

How much would it cost?

- Membership at the Cincinnati Bike Center starts at as little as \$12/month.
- Marketing of the plan to Cincinnati companies
- Additional bicycle racks

Are there other positive impacts?

- Fewer people on the roads driving
- Promotion of healthy living habits among residents

Are there possible unintended impacts?

- More bicycle related traffic accidents

- Congestion if cars cannot get around slower moving bicycles because there is not an adequate amount of bicycle lanes

Timeline for Implementation

Short-Term (One to Two Years): The City will support Queen City Bike in its launch of a commuter bike program and is looking for other partners to help implement. The City will also support Cincinnati Bike Center, located at the Banks, in its efforts to support downtown bike commuters with showers, towels, lockers and bike repairs. Membership starts at as little as \$12/month.

Green Cincinnati Plan – Transportation Recommendation

Freight Rail Network Improvements (Freight & Passenger Rail Impacts)

What is it and why is it important to the City of Cincinnati?

Freight - the movement of goods - is a major component of the transportation system. Moving goods by barge or rail is far more efficient than moving goods by truck. While the regional freight rail assets are strong, there are significant deficiencies that can impact freight mobility now and in the future. CSX, Norfolk Southern, and RailAmerica share three main lines through the Mill Creek Valley which are currently near capacity. With regional railroad traffic forecasted to increase 38 percent by 2040, bottlenecks in the rail corridor will erode rail freight mobility. If rail service quality degrades, freight traffic could shift to the highway system, which would increase congestion and negatively impact safety and air quality. Even worse, a degradation of rail service could cause shippers—regional businesses—to move to areas with more reliable rail service. Below are the estimated percentages for freight shipped into and out of the region by truck, rail and barge:

Estimated percentage of freight shipped into and out of region by truck, rail and barge.

Year	2009			2015			2020			2030			2040		
Mode	Truck	Rail	Barge												
Inbound	55%	19%	26%	58%	19%	24%	60%	18%	22%	65%	16%	19%	68%	15%	17%
Outbound	79%	12%	9%	78%	12%	9%	79%	12%	9%	81%	10%	9%	82%	9%	9%
total	67%	15%	18%	68%	15%	16%	70%	15%	16%	73%	13%	14%	75%	12%	13%

This chart shows the importance of continuing to improve the freight rail network because it will help increase the ease and convenience of transporting by rail. Some of the figures show a decline in rail freight transportation. This is further proof that more attention and funds should be given to improving the freight networks so these numbers can be reversed. Truck freight transportation should decrease since it is less fuel efficient than transporting by train.

The City of Cincinnati understands the importance of the movement of freight through the region. The freight network is also essential for the operation of intercity passenger rail such as the existing Amtrak service and other future corridors. The City of Cincinnati’s Railroad Improvement and Safety Plan (RISP) identifies proposed passenger rail improvements that will not impede the flow of freight. The RISP has identified a set of projects that will:

- Enhance freight rail service to and through Cincinnati
- Identify railroad related safety improvements
- Enhance rail passenger service to the Cincinnati Union Terminal

Several of the RISP projects were derived from Metro Moves and the ODOT Choke Point Study. Some of the RISP projects were included in the OKI Freight Study and the Long Range Transportation Plan.

How does it affect GHG emissions?

Moving freight by train is much more efficient than trucks – less fuel per ton of freight equals less GHG emissions and less air pollution impacts.

How can the City of Cincinnati influence the initiation of these programs?

The City can support the strategies mentioned in this recommendation.

Is it feasible?

The successful implementation of the RISP will depend on the partnerships and collaboration of various City departments, ODOT, the public, the railroads, and Amtrak.

Are there other positive impacts?

- Job retention
- Air Quality
- Shift from truck to rail has significant GHG impacts

Are there possible unintended impacts?

The potential of freight rail competing with passenger rail

Timeline for Implementation

Mid-Term (Three to Four Years): The City will partner with OKI to incorporate rail recommendations into the constrained LRTP. The two projects are:

- Mill Creek Additional Track which will increase rail capacity by adding approximately 8,600 feet of fourth track from RH Tower (located at the north end of the CSX Queensgate Terminal) to the NA Junction at an estimated cost of \$20 million.
- New Station Track which will add approximately 1500 feet of track parallel to CSX mainline tracks at the Cincinnati Union Terminal for future, additional passenger service at a cost of \$4 million

The City will partner with the railroads to build the Hople Street Passing Track and Crossover at the CSX Queensgate and NS Gest Street yards. This project will provide additional horizontal clearance, 1000' of track, and construct crossovers or connecting track at an estimated cost of \$15.6 million.

Long-Term (Five to Six Years): The City's DOTE will take the lead on building Museum Center siding.

Green Cincinnati Plan – Transportation Recommendation

Enhance Intercity Transit

What is it and why is it important to the City of Cincinnati?

Cincinnati currently has many modes of transportation that provide options for inter city travel. There are opportunities to enhance these options to increase the flow of travel throughout the cities in the Midwest region and beyond.

Recommendations for the following intercity transportation assets are included in this plan:

- Intercity Rail

Intercity passenger rail service to Cincinnati is currently provided by Amtrak's Cardinal Route, operating between Chicago and New York City via Washington D.C. Like many of its routes, Amtrak uses single level passenger equipment pulled by diesel locomotives for the Cardinal route. The Cincinnati station, located in the Union Terminal - Museum Center, provides full service to passengers, including a ticket office and special considerations for the physically disabled. Union Terminal is conveniently located near downtown Cincinnati, making the downtown area easily accessible to arriving train passengers. CSX Transportation trackage is used for most of the Cardinal's route between Chicago and New York City. Included in Amtrak's operating agreement with CSX are provisions for the Cardinal route to be given priority over freight trains. The Cardinal operates three days per week. However, Amtrak is considering an expansion to daily service.

The arrival times are during the early morning hours (1:13 am for the westbound train to Chicago and 3:17 am for the eastbound train to Washington D.C. and New York City). The City's Department of Transportation and Engineering (DOTE) is currently working with Amtrak, the Museum Center, and CSX Transportation to add a station/layover track parallel to the CSX Mainline tracks. Currently, the Cardinal stops on the CSX mainline track to load and unload passengers. The station track would allow more options for Amtrak to enhance service to Cincinnati and improve flow for CSX.

As part of the *Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)*, the Federal Department of Transportation designated a series of proposed High Speed Rail Corridors. Included were corridors linking Cleveland with Cincinnati and Chicago with Cincinnati. The proposal envisioned several 110 mph trains per day. The Cleveland to Cincinnati Corridor (3C) was planned to utilize existing Norfolk Southern tracks for much of the route and is part of the proposed Ohio Hub Plan. The Chicago to Cincinnati Corridor is part of the Midwest Regional Rail System (MRRS). The MRRS is a set of high-speed intercity passenger rail corridors that originate in Chicago. Some of the corridors have been implemented, but not the corridor between Chicago and Cincinnati. The MRRS Chicago to Cincinnati corridor uses a different railroad than Amtrak's Cardinal. The MRRS and the 3C Corridor are part of the Chicago Hub Network as shown on the next page.



Additional capacity like the new station track at the Cincinnati Union Terminal would be needed for these new corridors.

- Private Bus Companies

Greyhound Bus Line and Megabus provide intercity bus service and connect the region with other metropolitan areas around the United States. The Greyhound Bus Line station is located in downtown Cincinnati. Megabus does not have a station but uses on-street boarding locations in downtown Cincinnati and provides service to Chicago, Columbus, and Indianapolis. Greyhound offers many more options of possible destinations than Megabus. As Megabus has a business model based on providing low-price tickets to customers, it would be convenient for Cincinnati residents to have more options of cities to take the Megabus. The Megabus already travels to several cities located throughout the surrounding regions so Cincinnati should push to be added to these routes.

Sources: <http://us.megabus.com/> <http://www.greyhound.com/>

How does it affect Green house Gas (GHG) emissions?

Passenger trains and private buses allow for the transportation of a large number of people at one time. By having people choose this more efficient mode of transportation, the number of individuals using cars to travel long distances will be reduced, which lowers the GHG emissions.

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati needs to make residents more aware of the intercity assets Cincinnati already has in place. In order to change people's behavior of driving to destinations such as Indianapolis, Chicago, or Columbus, residents need to be conscious of other more energy efficient transportation modes. (See other recommendation on interconnection of modes)

Is it feasible?

Potential obstacles to enhancing intercity transportation assets could include:

- Resistance to transit at the state level (3C Rail)
- Cost to implement new routes

How much would it cost?

- The State of Indiana has estimated it costs \$4 million/year to pay for the Hoosier State route that helps make the Amtrak Cardinal route more convenient.

Source: <http://www.jconline.com/article/20121214/NEWS02/312140044/amtrak-lafayette>

- Ohio Hub Passenger/Midwest Regional Rail Cincinnati Terminal: \$17.3 million
- Costs very little to promote/highlight that it is an advantage to the city to have these services downtown
- Detailed visions of the above recommendations can be found in the OKI 2030 Regional Transit Plan: http://www.oki.org/departments/transportation/pdf/2030plan/Chapter_09.pdf

Are there other positive impacts?

- Helps strengthen other modes of transportation
- Reduces congestion on highways
- Land Use - Activates parts of the city and brings traffic into Cincinnati
- Jobs - ticket agents, support staff, drivers

Are there possible unintended impacts?

- Greyhound's negative image
- Idling emissions

Timeline for Implementation

Short-Term (One to Two Years): The City will support Amtrak, Megabus, and Greyhound in marketing efforts to promote their services.

Mid-Term (Three to Four Years): The City will take the lead in revising rail recommendations after the 2014 gubernatorial election.

Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): The City will continue to support Amtrak, Megabus, and Greyhound in marketing efforts to promote their services.

Green Cincinnati Plan – Transportation Recommendation
 Improve Pedestrian Connectivity

What is it and why is it important to the City of Cincinnati?

According to the organization Transportation for America, the Cincinnati area is the 11th safest for pedestrians among the 52 U.S. metro areas with populations larger than 1 million. The following chart is statistics for 2011:

Cincinnati Pedestrian Danger Index			
Total Pedestrian Fatalities (2001-2009)	Avg. Annual Pedestrian Fatality Rate (per 100,000 people)	Percent of People Walking to Work	Pedestrian Danger Index
172	0.8	2.20%	37.7

Source: <http://t4america.org/resources/dangerousbydesign2011/states/worst-metros/>

These statistics show Cincinnati to be a leader in pedestrian safety, but further improvement is possible and desirable. This plan gives recommendations to promote pedestrian connectivity in the city and provide solutions for pedestrian safety issues. Recommendations include focusing on areas of concern such as sidewalks, trails, and signals.

One suggestion to improve pedestrian connectivity is focused around schools. The National Center for Safe Routes to School (SRTS) is a leading organization that promotes programs to improve walking and bicycling conditions near schools and inform the community of its importance. On a broader level, SRTS programs can enhance children’s health and well-being, ease traffic congestion near the school and improve air quality and improve community members’ overall quality of life. The City of Cincinnati should partner with CPS and the local SRTS program to implement SRTS recommendations.

The U.S. Department of Transportation’s Federal Highway Administration (FHWA) has identified opportunities for improvement in pedestrian signal timing. The FHWA suggests that pedestrian cross-walk signs that have shorter cycle lengths and longer WALK intervals generally provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best. Pedestrian push buttons may be installed at locations where pedestrians are expected intermittently. Concurrent pedestrian signal timing (where motorists may turn left or right across pedestrians' paths) may be used where pedestrians are expected intermittently. Exclusive pedestrian intervals which stop traffic in all directions tend to be a better choice for areas with high pedestrian volume. This timing has been shown to reduce pedestrian crashes by 50 percent in downtown locations with heavy pedestrian volumes and low vehicle speeds and volumes. With concurrent signals, pedestrians usually have more crossing opportunities and have to wait less.

A simple, useful change is the "leading pedestrian interval" (LPI). An LPI gives pedestrians an advance walk signal before the motorists get a green light, giving the pedestrian several seconds to start in the crosswalk where there is a concurrent signal. This makes pedestrians more visible to motorists and motorists more likely to yield to them. This advance phase approach has been used successfully in several places, such as New York City, for two decades and studies have demonstrated reduced conflicts for pedestrians. The advance phase approach is particularly effective where there is a two lane turning movement.

Adjusting signal timing is very low cost, and requires a few hours of staff time to accomplish. New signal equipment is approximately \$20,000.

Source: <http://safety.fhwa.dot.gov/saferjourney/library/countermeasures/41.htm>

The last aspect of this recommendation is to develop policies such as retrofitting existing land uses to serve pedestrians. The Pennsylvania Statewide Bicycle and Pedestrian Master Plan includes guidance on downtown redevelopment, "pedestrianizing" existing retail/office developments, and retrofitting suburban residential neighborhoods such as:

- Maximize pedestrian transit access to the site from adjacent land uses
- Improve the layout of buildings and parking lots
- Bring destinations closer to home
- Encourage denser development or redevelopment.
- Provide sidewalks and street trees
- Reduce the speed of automobile traffic
- Provide off-road internal pathway systems
- Provide "pocket" parks and community green space

These recommendations can help improve pedestrian connectivity of all Cincinnati's pedestrian routes such as trails, walkways, and sidewalks. This will help encourage residents to walk as a mode of transportation as the ease and safety of walking in the city increases. Source: www.dot.state.pa.us.

Who will have leading roles in implementation of this recommendation?

- Safe Routes to School
- City Health Department
- Actual implementation: DOTE, CPS, OKI

Who will be the targets for this program?

All communities with limited pedestrian connectivity will be targets.

How does it affect GHG emissions?

For every car trip that is replaced with walking we save 0.96 pounds of CO₂ per mile.

A 5 percent increase in the walkability of a neighborhood is associated with:

- A per capita 32.1 percent increase in non-motorized travel
- 6.5 percent fewer miles driven

- 5.6 percent less NOx emitted
- 5.5 percent less volatile organic compounds (VOCs) emitted

Source: <http://www.bikesbelong.org/resources/stats-and-research/statistics/environmental-statistics/>

How can the City of Cincinnati influence the initiation of these programs?

- Partner with CPS in implementing Safe Routes to Schools
- Review traffic signal timings with an eyes toward improving walkability
- Review street standards and development codes to ensure walkable designs; and implement those standards and codes.

Is it feasible?

Potential obstacles to this plan could include:

- Lack of space to implement more pedestrian walkways

How much would it cost?

- Construction costs
- Education/Awareness

Are there other positive impacts?

- Health and air quality
- Land use
- Healthier residents

Are there possible unintended impacts?

- Pedestrian safety
- Longer travel time for cars – more idling at lights for cars

Timeline for Implementation

Short-Term (One to Two Years): The City’s DOTE will take the lead in the adoption and implementation of a “Complete Street” manual for Cincinnati.

The City of Cincinnati will partner with Safe Routes to School to identify missing pedestrian links and operational issues like signal timing.

Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): The City’s DOTE will take the lead in incorporating pedestrian considerations in maintenance and new facilities.

Green Cincinnati Plan – Transportation Recommendation

Interconnect Modes of Transportation

What is it and why is it important to the City of Cincinnati?

Currently there are many opportunities to implement convenient and easy connections between Cincinnati's different modes of transportation. For example, there are opportunities to connect Government Square where most Metro bus routes terminate to the Amtrak station, Greyhound station, or Cincinnati/Northern Kentucky International Airport (CVG). These examples show the importance of the recommendation for Cincinnati to improve the interconnectivity of the modes of transportation throughout the city. This recommendation will help increase efficiency of people moving by different modes of transportation and increase the options people have when traveling around the Cincinnati area. By supporting innovative mobility solutions and connecting modes of transportation, Cincinnati could significantly alleviate congestion as people are able to choose between various mobility options and have a real alternative to owning a car.

Recommendations for strategies to interconnect transportation modes include:

- Aerobus - Barcelona example:

The Aerobus is the bus service that connects the airport and the center of Barcelona every 5 minutes, every day of the year. In about 35 minutes passengers can go to the city center or to any of the airport terminals in a convenient and economical manner, without having to make transfers. The route has stops at strategic points in Barcelona. All Aerobus vehicles are equipped for the disabled, have a large space reserved for luggage, and provide all the comforts of a good public transport. A bus service such as Aerobus would be an example of how Cincinnati could easily connect traffic from the airport to the rest of the city. The Aerobus could have several drop-off points throughout Cincinnati, especially at hubs of other major modes of transportation such as the Metro, Amtrak, and Greyhound stations. This way people arriving into and departing from Cincinnati can easily reach their destination through public transport.

Source: <http://translate.google.com/translate?hl=en&sl=ca&u=http://www.aerobusbcn.com/&prev=/search%3Fq%3Daerobus%2Bbarcelona%26hl%3Den%26biw%3D1173%26bih%3D582%26prmd%3Dimvns&sa=X&ei=5DhZUKSiOKj30GHZpYC4Dg&sqi=2&ved=0CEsQ7gEwAw>

- Bike Share Program

Modern bike sharing programs, like the ones in Denver, Washington D.C., Boston, and other locations, utilize technology to allow people to use bikes for short periods of time easily and affordably. Bike kiosks are located around the City, each with places to keep about 10 bikes securely locked. The kiosk has a swipe card reader that recognizes bikeshare membership cards or credit cards. Just swipe to borrow a bike, and return it to a kiosk near your destination. For the return trip, just swipe and take the same bike, or a different one. Typically the first 30 minutes of each rental is free.

The City of Cincinnati has completed a feasibility study identifying the best way to implement a successful bike share program in the city. The study recommends 21 station locations in the Downtown/OTR area and 14 stations in the Uptown area.

Station locations were determined through an analysis of potential demand based on where people live, work, play and shop, and the desire to travel between these places. Public input through a collaborative mapping website also played a significant role in determining the recommended station locations. The stations with the most public support included those at Washington Park, Fountain Square, Findlay Market, the Purple People Bridge, Union Terminal, and Government Square. A bikeshare program would dramatically increase the visibility and usage of bicycles in Cincinnati.

Source: <http://www.cincinnati-oh.gov/bikes/news/study-recommends-35-bike-share-stations/>

- Adding bike racks to the Amtrak station at Union Terminal

There is currently no secure location for bicyclists to leave their bikes after riding to Union Terminal to travel on the Amtrak. Installing a bike rack at the Amtrak station where bicyclists can feel confident about leaving their bike for an extended period of time will help increase the number of people inclined to use bicycling as a mode of transportation to reach Union Terminal.

Examples of current interconnected transportation modes in Cincinnati which would be increased include:

- Metro Park & Ride

Metro has a network of 25 Park & Ride locations throughout Greater Cincinnati. Parking at a Park & Ride is free. Google Maps on the website below allows people to easily find a Park & Ride near them, get driving directions, and find information on routes served, monthly passes available, and fares. Many people do not use the Metro system because there is not a Metro stop close to their house. If there were more Park and Ride locations, it would be convenient for more people to leave their car and ride Metro.

Source: <http://www.go-metro.com/riding-metro/park-ride>

- Bike and Ride

Every Metro bus is equipped with a front-mounted bike rack that's easy to use. People may use the bike rack from any Metro stop, including Government Square, Metro's downtown hub.

Source: <http://www.go-metro.com/riding-metro/bike-ride>

Who will take leading roles in implementation of this recommendation?

- METRO
- DOTE
- OKI
- Queen City Bike
- TANK

Who will be the targets for this program?

All residents will be targeted to use these modes of transportation.

All public modes of transportation will be targeted to participate in connecting with one another.

How can the City of Cincinnati influence the initiation of these programs?

The City can support the organizations working cooperatively to incorporate City supported transportation modes such as METRO, bike routes, etc.

Is it feasible?

Potential obstacles to interconnecting modes of transportation could include:

- Land availability to interconnect routes if necessary
- Changing the transportation habits of people

How much would it cost?

- Costs and revenues associated with enhanced CVG bus service will need to be evaluated.
- Costs for a bikeshare program are being determined via an RFP process.

Are there other positive impacts?

- Less traffic congestion
- Increased revenue from more people using City transportation

Are there possible unintended impacts?

- Wait times if public transit too crowded

Timeline for Implementation

Short-Term (One to Two Years): The City will support Metro in its addition of the new Metro Route 1.

Mid-Term (Three to Four Years): The City will support the Museum Center, 3CDC, and Queen City Bike in their efforts to put bike lockers near Greyhound, Megabus, and Union Terminal.

Green Cincinnati Plan – Transportation Recommendation

Traffic Signal Optimization

What is it and why is it important to the City of Cincinnati?

A traffic signal optimization program ensures maximum green light times for the heaviest traffic flows and allows signal cycle time to adjust based on changing demands during peak times, such as rush hour.

The City of Cincinnati has over 756 intersections with traffic signals. Approximately half of those are connected to the Computerized Traffic Signal System (CTCS). This system allows flexibility in the operation of the signals throughout the day, to allow for more efficient distribution of green time for changing traffic levels. Traffic signals along a route are also coordinated with one another to provide for a smooth flow of traffic in peak directions – typically inbound to the CBD in the morning, balanced during the off peaks, and outbound from the CBD in the afternoon. This combination of individual intersection and coordinated control can be used to optimize travel times and reduce stops, delays, and associated emissions.

The City is seeking to expand the reach of the CTCS throughout the City. It is also important to train engineering and technical staff to develop improved traffic signal timing and progression, as well as controller maintenance and set-up standards. This also includes the incorporation of new federal requirements for pedestrian signal timing and new detection guidance for cyclists.

In summary, a good system of traffic signal design and operation can minimize delays and associated emissions, but also encourage and make safe the use of bicycles and walking creating a safer environment for all users.

Portland, Oregon Example

Source: http://www.climatetrust.org/traffic_signals.html

Project description

The Climate Trust, a mission-driven nonprofit that specializes in climate solutions for governments, utilities, and large businesses, contracted to buy offsets from the City of Portland project that improves the timing of traffic signals. Over a five-year period, the former Portland Office of Sustainable Development (now the Portland Bureau of Planning and Sustainability) worked with the Portland Office of Transportation, Washington County, and the Oregon Department of Transportation to improve signal timing on 17 major metropolitan area arterials. Traffic signal system operators conducted studies and took specific steps to optimize the flow of traffic on some of Portland's most congested thoroughfares.

By reducing idling and acceleration, emissions of carbon dioxide from gasoline and diesel fuel decreased. This project also reduced emissions of other tailpipe pollutants.

City program costs are covered through a pay-for-performance contract with The Climate Trust. After the signal timing has been completed, The Climate Trust pays Portland based

upon the amount of carbon dioxide emissions that will be avoided. The City of Portland transfers ownership of the carbon dioxide offsets created by these reduced emissions to The Climate Trust.

How the project reduces emissions

This project helps reduce emissions from vehicles by reducing the amount of time cars spend idling at and accelerating from traffic lights. Improved traffic flow and reduced fuel waste from stop-and-go driving leads to less carbon dioxide released into the atmosphere.

Why carbon finance was needed

The Climate Trust's funding for the traffic signal optimization was critical as the previous government funding sources had been unavailable.

Results

In the program's first six years, more than 157,000 metric tons of carbon dioxide emissions were prevented, the equivalent of the emissions generated from burning 17.7 million gallons of gasoline. As a result of this success, city officials extended the partnership contract through 2012 with a goal of reducing an additional 21,000 metric tons of carbon dioxide. The project was awarded a 'Smart Solutions Spotlight' from ITS America in February 2010.

Source: <http://t4america.org/blog/2010/10/13/smarter-transportation-case-study-5-traffic-signal-optimization-portland-oregon/>

Seattle, Washington Example

Source: <http://www.seattle.gov/transportation/signaloptimization.htm>

Seattle's Signal Optimization Program is a coordinated effort designed to make the most efficient use of Seattle's traffic signals by improving traffic signals, gathering up-to-date traffic data, and taking advantage of new technologies. "Optimization" in this context refers to all maintenance, upgrades, timing adjustments, and miscellaneous efforts to improve Seattle's signals.

The Seattle Department of Transportation's (SDOT) re-timing, or synchronizing, traffic signals in 17 corridors throughout the city will result in smoother and quicker trips for platoons of traffic, with maximum green-light time, especially through corridors that handle heavy volumes of freight. Work has already begun on the 150 signals to be analyzed and re-timed as part of this synchronization effort. Seattle has over 975 signalized intersections, many of which have been re-timed during the last five years.

To get the most out of the network of signals, engineers must constantly make sure that equipment, such as signal heads, control boxes, and sensors, are functioning optimally, and that the data, which include traffic volumes and intersection specific traffic movements, are current and reliable. Assuring these two things enables the Traffic Management Signal Operations team to help manage the increasing number of cars, buses, pedestrians, and bicyclists.

SDOT engineers start by gathering real-time data at each intersection along the corridor to find out the most up-to-date travel patterns. Since Seattle's transportation demographics are constantly shifting, it is important to gather data every few years to ensure the best use of the signals. Once the data have been gathered, engineers use a computer program to develop the best timing scenarios for each intersection on both an individual and a collective basis. More than half of all signalized intersections in Seattle have the newest control boxes which allow for up to 16 cycle options (which differ due to changing traffic patterns over the course of a day) and are interconnected to allow for coordinated communication between the intersections.

How can the City of Cincinnati influence the initiation of these programs?

It is important for the City of Cincinnati to be proactive in creating a Traffic Signal Optimization Plan to help implement this recommendation. The Washington, DC-MD,VA area implemented a plan which resulted in total annual savings in 2007 of \$1.12 million. The steps for organizing Washington, DC, Maryland and Virginia's Traffic Signal Optimization Plan are listed below:

1. Data Collection
 - Intersection geometry
 - Existing signal timings
 - Turning movement counts
2. Data Analysis
3. Network Setup
 - Synchro (signal optimization software used by traffic engineers nationwide)
4. Optimization
 - Compare before and after plans
5. Simulation
 - SimTraffic is a system which can be used
6. Implementation and Fine Tuning
7. Evaluation – can use measures of effectiveness listed
 - Delays
 - Stops
 - Fuel consumption
 - Pollutant emissions
 - Travel time

Source: <http://www.baltometro.org/ITS/TSF07-1A-SignalOptimization.pdf>

Is it feasible?

Potential obstacles to achieving traffic signal optimization could include:

- Time and resources for data collection

How much would it cost?

Please see DOTE capital budget.

Are there other positive impacts?

- Increased pedestrian and traffic safety
- Smoother traffic flow

Are there possible unintended impacts?

Confusion for motorists who are used to existing signal timing

Timeline for Implementation

Short-Term, Mid-Term and Long-Term: The City's DOTE has an ongoing leadership role. Please see DOTE capital budget for a more detailed description.

Green Cincinnati Plan – Transportation Recommendation
Cincinnati Fleet Fuel Efficiency

What is it and why is it important to the City of Cincinnati?

The City of Cincinnati has a significant role to play in improving the efficiency of its fleet and reducing emissions from fleet operations. Whenever possible, all City vehicles including pickup trucks, off-road equipment, vans, wagons, police cruisers, and administrative sedans should be replaced with more fuel efficient or alternative fuel vehicles. The City has been working with Clean Fuels Ohio to develop a plan for greening the City’s fleet. On November 28, 2011 the Phase I Report for the Green Fleet Strategic Plan was submitted to City Council. The Phase 1 Report set a goal to eliminate the use of gasoline and diesel in City vehicles by 2025. The following recommended strategic direction was developed to guide the plan’s development:

- Reduce the current fleet size and develop a regular review process to ensure the City’s fleet is appropriately sized in relation to staffing, equipment utilization, and service demands.
- Explore alternatives to traditional vehicle ownership including leasing and car-sharing models.
- Acquire energy efficient and alternative fuel vehicles and off-road equipment whenever the lifecycle cost (including all available subsidies) is less than the lifecycle cost of conventional vehicles.
- Improve fleet tracking metrics, data gathering, and review. Establish baselines around fleet efficiency, vehicle miles travelled, emissions, and green technology deployed to track progress over time.
- Improve policies and procedures in order to move to a more proactive fleet management model.

The City of Cincinnati Fleet Services Division has been testing and evaluating alternatively fueled equipment since 1993. In 1997, the City chose Ethanol based fuel (E85) as the City’s fuel of choice and built the first E85 refueling station in the City of Cincinnati.

By 2004, the City fleet contained 135 ethanol powered administrative vehicles (37% of the fleet) and one Toyota Prius. By 2007, the City fleet contained 277 ethanol powered administrative vehicles and one Toyota Prius. By 2011, the City fleet included 29 hybrids, 12 propane trucks, 552 E-85’s and 3 electric vehicles in fleet (as of 6-29-11)

In order to plan for approximately how often vehicles in the City’s fleet will need to be replaced, the chart below shows the general guidelines set by the City to assess vehicle replacement eligibility:

Current City Replacement Consideration		
Type of Vehicle	Typical Year Life	Typical Miles Limit
Administrative Cars	6	60,000

Police Beat Cars	4	100,000
Pick-up Truck	7	70,000
Vans	7	70,000
Medium Duty Trucks	10	100,000
Heavy Duty Trucks	10	100,000
Rear Loaders	7	100,000
Construction Equipment	20	N/A
Small Equipment (Mowers)	3	N/A
Motorcycles	5	N/A
Pumpers & Aerials	10	100,000

Metro Example

The Metro fleet is a good example of what is possible when managing fleets. At the end of 2012, Metro had 27 hybrid buses and 45 mini hybrid buses which helped reduce GHG emissions by 2000 tons in 2012. Metro has also capitalized on their visible presence by branding these buses with green messaging.

Who will be the targets for this program?

City of Cincinnati Fleet Services

How can the City of Cincinnati help influence this plan?

There are ten recommended actions for the City communicated in the Green Fleet Plan from Clean Fuels Ohio:

1. Create right-sizing policies and procedures for all new vehicle and equipment acquisitions
2. Conduct a detailed fleet vehicle utilization study and develop of process for regular review
3. Reduce fleet size to match current staffing levels and overall operational needs
4. Create new procedures to establish vehicle life-cycle and replacement schedules that will maximize useful life of equipment while reducing operational and maintenance costs
5. Develop procedures to track and eliminate unnecessary vehicle idling
6. Improve driver behavior and vehicle maintenance regimes
7. Apply standard models and pay-back calculations to determine the feasibility of other vehicle and equipment options beside traditional ownership models
8. Acquire energy efficient and alternative fuel vehicles whenever the lifecycle costs are less than the lifecycle cost of conventional vehicles
9. Pursue state and federal initiatives, subsidies, grant programs and other incentives to help reduce the implementation costs of strategies and technologies outlined in the plan
10. Develop a green fleet strategic plan outlining a detailed implementation schedule over short, medium and long-term timeframes to ensure fleet success

What is the cost-savings benefit analysis?

The Green Fleet Plan from Clean Fuels Ohio has cost-savings benefit analysis for the following alternative fuel options for the City's vehicle fleet:

- Biodiesel
- Ethanol – E85
- Propane Autogas (LPG)
- Compressed Natural Gas (CNG)
- Hybrid Electric
- Plug-in and Dedicated Electric

Each alternative fuel option is further detailed in Green Fleet Plan, and by comparing these options, the City can better determine best decision for lifetime savings on the new vehicles purchased.

Is this plan feasible?

Yes, in fact operating savings can be used to finance the construction of alternative fuel filling stations.

Are there other positive impacts?

- Potential to sell CNG to other fleets and private sector users.

Are there possible unintended impacts of this plan? No.

Timeline for implementation

Short-Term (One to Two Years): The City will partner with DPW, Clean Fuels Ohio, CNG providers and GCWW to implement RFP for CNG fueling.

Medium Term (Three to Four Years): The City will partner with Clean Fuels Ohio, CNG providers and GCWW to build CNG fueling and purchase CNG, propane and electric vehicles.

Long-Term (Five to Six Years): The City will partner with DPW, Clean Fuels Ohio and CNG providers to continue to purchase CNG, propane and electric vehicles.

Green Cincinnati Plan – Transportation Recommendation

Expand Incentives for Electric Cars

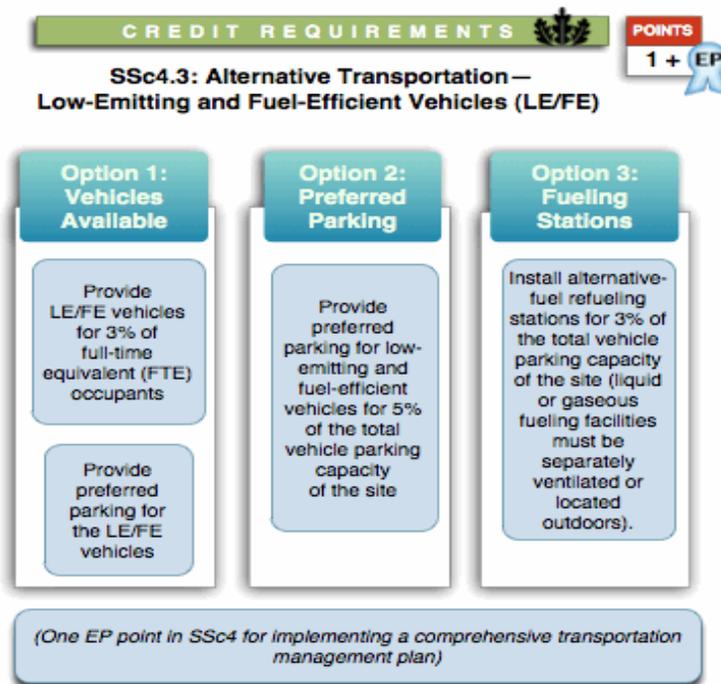
What is it and why is it important to the City of Cincinnati?

This recommendation is to provide incentives such as charging stations and preferred parking spots to those driving electric cars. These initiatives will be part of a larger goal to make Cincinnati a more electric car-friendly city.

Meters and other designated parking spots throughout Cincinnati in high traffic areas would be preferred parking for only electric cars. The City of Cincinnati could also work with mass transportation facilities such as Amtrak, Greyhound, and the airport to give parking incentives to electric cars. An example of this can be found at the Los Angeles airport where electric cars are allowed to park for free at charging stations for up to 30 days.

Sources: <http://www.cincinnati-oh.gov/oeq/residential-programs/electric-vehicle-free-parking/>
http://www.lawa.org/welcome_lax.aspx?id=58

Developers also have the opportunity to get LEED points for designating high efficiency parking spots throughout the city. This credit is focused on limiting environmental impacts from automobile use. It targets commuting specifically, but also addresses company vehicle fleets, maintenance vehicles, and buses. Projects that have substantial parking areas may find the requirements of this credit to be low-hanging fruit, because they should easily be able to designate preferred parking for low-emitting and fuel efficient cars. Below is a chart of credit requirements for this recommendation:



Source: <http://www.leeduser.com/credit/NC-v2.2/SSc4.3>

Chicago's Car Sharing I-GO Program for Electric Cars could be used as a model for how Cincinnati can increase awareness about electric car use. By making two electric cars available to I-GO members, I-GO and ComEd's mission is to jump-start the electric car learning curve and discern valuable information about how plug-ins can be integrated into a more expansive car-sharing model. Source: http://www.igocars.org/locations/comed_phev/

Zipcar is available in Cincinnati, giving the City the opportunity to have six electric cars available to the community. In real time, the program will be monitored and utilization rates analyzed to determine when more cars should be added to the program. The City already has high miles per gallon cars from Zipcar.

The University of Cincinnati has implemented a program in partnership with Zipcar on its main campus which allows students and faculty Zipcar members the opportunity to use the cars 24 hours a day 7 days a week.

Cincinnati Parks is working with Duke Energy to provide electric car charging stations at Riverfront Park, Fountain Square, and Washington Park. The City of Cincinnati can partner with Cincinnati Parks to determine public usage and demand for additional strategically placed electric vehicle charging stations. As public charging stations become more conveniently located, this will help incentivize people to drive electric cars and make Cincinnati a suitable city to have an electric car.

How can the City of Cincinnati influence the initiation of these programs?

The City could use the current two-wheeler parking program as an example of how to launch this plan for fuel efficient cars and van/carpools. In an effort to accommodate the increasing demand for convenient parking for electric cars in the urban core, the City should expand the downtown pilot program for electric cars. The pilot program can be based on the results of a month-long public participation process that identifies five convenient on-street parking locations. Each location should accommodate two to four vehicles. The parking spots could be designated for electric car use by noticeable green signs. Source: <http://www.cincinnati-oh.gov/twowheeler/>

Is it feasible?

Potential obstacles to expanding this program include:

- Deciding where these preferred parking spaces will be located
- Space for charging stations
- Enforcement of the preferred parking to only electric cars

How much would it cost?

- Charging station equipment cost
- Construction and installation
- Maintenance

Are there other positive impacts?

- Increase the number of people driving an electric car

Are there possible unintended impacts?

No.

Timeline for Implementation

Short-Term, Mid-Term and Long-Term: The City will partner with Duke Energy, Parks, 3CDC, Parking Authority, and DOTE to continuously install charging stations at select locations.

Green Cincinnati Plan – Waste Recommendation

Pay-As-You-Throw

What is it and how will it benefit the City of Cincinnati?

A Pay-As-You-Throw (PAYT) program provides a direct economic incentive to residents to reduce their waste. Under PAYT, the City would charge households for their waste collection based on the amount of waste they throw away.

PAYT programs create a direct economic incentive for residents to increase recycling and composting. With such a system, some communities have seen a significant decrease in waste and an increase in recycling. Many residents also view the system as more equitable because residents only pay for what they throw away. A household that recycles and reduces their waste will pay less than their neighbor who makes no effort to reduce their waste. Communities with PAYT programs have seen a significant decrease in waste collection (17 percent by weight) and an increase in recycling. There are currently over 7,000 PAYT programs in the United States and approximately 68 communities in Ohio have PAYT programs according to the Ohio Department of Natural Resources.

Source: <http://www.epa.gov/osw/consERVE/tools/payt/states/oh.htm>

Case Example: Madeira

The City of Madeira currently has a PAYT system in place. Madeira’s system allows one 35 gallon cart per household for free with additional pickups costing \$0.75 per 35 gallon container. Below is a chart summarizing Madeira’s version of PAYT and the costs associated:

Waste Collection Type	Cost
35 gallon cart for household waste	No extra charge
Additional waste	Requires a \$.75 garbage sticker per additional container
Recycling bin or 65 gallon toter	No extra charge
Large items (sofa, dishwasher, etc.)	Requires 13 of the \$.75 stickers (\$9.75)

How can the City of Cincinnati influence this recommendation?

The citizens of City of Cincinnati passed a charter amendment in 2011 prohibiting the City from assessing, levying or collecting any tax or assessment for the collection, transportation or disposal of garbage or other waste. The City could propose a new amendment that could allow for PAYT. The City could then institute a cart base trash system that could incorporate PAYT characteristics.

Source: http://ballotpedia.org/wiki/index.php/Cincinnati_Garbage_Fee_Charter_Amendment_%28November_2011%29

Is it feasible?

Potential obstacles to the PAYT program include:

- Lack of commitment by community leaders
- Initial capital investment for waste containers
- Residents on a fixed income would have to potentially pay for waste collection
- Development of a billing system
- Education – at least six months of intensive education needed
- Viewed as an additional tax – Cincinnati residents have never been billed for waste collection

How much would it cost?

To implement a PAYT system, it is recommended to charge residents based on the size of the container. The more garbage containers, the more a resident would pay for waste collection. Each household would receive a waste container at no charge. If residents require additional and larger containers, they would be charged for that added service. The average cost for a container is \$40, for a total cost to the city of \$4,160,000 (based on 104,000 households). This would equate to \$4.7 million in the 2013 City Budget.

Cincinnati residents currently receive unlimited waste collection through their taxes; therefore, residents do not understand the true cost of waste collection. This will be a challenge for the City to communicate to residents that not only will they be charged for waste collection but the City will also eliminate city-wide unlimited collection. It is recommended that the City continue to provide for the collection of large items, appliances and tires on a call-in basis.

Education is a key component to PAYT. The City of Austin spends \$6-\$8 per household per year on education. This translates to \$630,000-\$840,000 for the City of Cincinnati.

Costs

Garbage carts – minimum \$4.2 million, as every household will receive a garbage cart. The carts are currently financed.

Education - \$630,000 - \$840,000

Revenue

Revenue from billing system – to be determined when rate structure is developed

Savings

Disposal savings - \$415,625 annually (based on 17 percent reduction in waste). On average Cincinnati disposed of 97,800 tons per year. A 17 percent reduction in waste is 16,625 tons. Multiplying 16,625 tons by \$25 per ton for landfill disposal is \$415,625

Are there any other positive impacts?

- Reduced litter through the provision of carts
- Economic sustainability – PAYT is an effective tool for communities struggling to cope with soaring MSW management expenses. Well-designed programs generate the

revenues communities need to cover their solid waste costs, including costs of such complementary programs as recycling and composting

- Equity – One of the most important advantages of a variable-rate program may be its inherent fairness. When the cost of managing trash is hidden in taxes, residents who recycle and prevent waste subsidize their neighbors' wastefulness. Under PAYT, residents pay only for what they throw away.
- Reduced worker injury
- It is estimated the City will save over one million dollars per year on reduced worker compensation claims by using semi-automatic equipment

Implantation Timeline

Mid-term (Three to Four Years): As there is currently a charter amendment prohibiting the City from assessing, levying or collecting any tax or assessment for the collection, transportation or disposal of garbage or other waste until 2021, this amendment will need to be overruled if PAYT is to be implemented. The City will need to take the lead on proposing a new amendment and implementing the PAYT system

Green Cincinnati Plan – Waste Reduction Recommendation

Funded, “Best in Class” Marketing Campaign

What is it and why is this important to the City of Cincinnati?

The funded, “Best in Class” multi-year research and marketing campaign will be an effort to enhance awareness, advocacy and participation of residential recycling. The City of Cincinnati’s goal is to reach a 25 percent diversion rate for the residential/commercial sector by 2013 and a 30 percent diversion rate by 2015. A number of techniques will be used to reach the public regarding recycling options, as well as, techniques to inform the public of successful benchmarks being reached as a result of recycling participation throughout the city. As the City of Cincinnati has the largest database of recycling behavior for its residents in the U.S., this marketing campaign is important because it can complement the research already in the database to help gauge the perceptions of the people in the city regarding recycling participation. Then, measure whether these perceptions and willingness to participate have changed by setting desired outcomes of increases in participation that should be achieved by the end of the campaign.

How will this plan be accomplished?

According to the Hamilton County Recycling and Solid Waste District and the success seen in areas such as Austin, approximately six to eight dollars per household per year must be spent on the campaign of this nature to be successful. The last official count of the number of households in the city was 133,420 meaning almost \$800,520 to \$1,067,360 should be allocated to have an effective campaign. An \$80,000 campaign was launched in the fall of 2012 by the Hamilton County Recycling and Solid Waste District for the entire county which has 325,766 households.

In order to help drive this campaign and make it “best in class,” the city needs to focus on making the campaign a bigger collaborative effort in the future. Cincinnati is known as a marketing hub with companies known nationally and worldwide for their marketing expertise such as Burke, Procter & Gamble (P&G), Nielsen, etc. There are numerous sources of marketing expertise available here in the city, which must be taken advantage of to build this campaign. Not only can working with these companies be helpful to drafting and carrying out the plan, but many companies are eager to form an even greater partnership with the City. Companies such as P&G, Kroger, etc. want to make sure their products end up being recycled instead of landfilled. The companies realize their environmental responsibility includes playing a part in making sure recycling happens creating an opportunity for the City to partner with the companies to help create awareness of this effort.

Another aspect of the marketing plan will be the challenge of keeping the message of the marketing blitz fresh in people’s minds. The purpose of the campaign is to create awareness, participation and advocacy; however, often after the marketed message is not directly in sight of people it is easily forgotten. It is highly important to continue spreading the message about recycling and proper waste management. The OEQ quarterly newsletter is one outlet through which the issues of the marketing campaign can be continuously revisited. Funding for the OEQ newsletter for the next three years is recommended in this

recommendation in order to continue the energy behind the marketing campaign. Other low or no-cost methods to keep the message in people’s mind need to be utilized, such as increasing messaging through social media and building the OEQ e-newsletter mailing list.

What are the desired outcomes and how will these be measured?

Specific tactics to be used under this plan and goals for desired outcomes should be set. Some of these could include:

Goal	Desired Outcomes	Strategy to Achieve Outcomes
Pitch recycling stories to the media	Release a major story quarterly	Keep an archive of recycling stories happening throughout the city so a selection is present for the monthly spotlight stories

Goal	Desired Outcomes	Strategy to Achieve Outcomes
Promote existing residential programs/initiative	Achieve a 25% increase in participation in the residential recycling program	Target areas with low recycling participation, increase education on recycling benefits, increase incentives for recycling participation

Goal	Desired Outcomes	Strategy to Achieve Outcomes
Hold neighborhood recycling competition	Hamilton county communities publish recycling rates/statistics annually in press release	Determine which communities would want to participate, develop uniform system for keeping statistics on recycling
	The top 15% of community teams are sent a congratulatory letter by the City	The letter will be sent to community leaders to recognize the community's commitment to recycling
	The top 5 community teams are given a media story and recognition ceremony by the City	Giving the winning communities public recognition through the media and recognizing the communities in person will hopefully incentivize the communities to be involved in participation

In order to try to measure the effectiveness of the marketing campaign, it is important to measure metrics before and after the campaign. For example, the percentage of households signed up for recycling before and after the marketing campaign could be compared.

How can the City of Cincinnati influence the initiation of these programs?

For marketing purposes surrounding recycling and waste management, the City should look to partnering with Hamilton County. Both organizations want to market and promote the same ideas and message surrounding these topics. Partnering together allows for

several advantages including no overlap in efforts, consistent messaging and the opportunity to combine resources.

Some areas the City of Cincinnati can take an active leadership role in the recommendation is through the promotion and accessibility of recycling at all local major events. Local major events have high traffic so visibility of recycling throughout the events is important to reach a large number of potential participants and start ingraining recycling in people's minds. The City can also help promote the increased participation in recycling that will occur once the marketing campaign has been deployed. This can be done through such things as the recognition ceremonies of communities or neighborhood, which excel in their recycling programs or increasing awareness of communities' successes in increased participation at City Council meetings. The city already has relationships with the marketing firms located here so it can utilize these relationships to help tap the resources at these firms to help create the marketing campaign.

Is it feasible?

Potential obstacles to the Funded, "Best in Class" Marketing Campaign could include:

- Choosing which media outlet will reach the greatest number of people
- Resistance from public to change recycling habits
- Cost of evaluation, especially a research based evaluation

How much would it cost?

- Determine media cost in dollars
- Other promotional techniques: posters, flyers, etc.
- Time maintaining database on community recycling rates

Are there other positive impacts?

- Ability to reach a large number of people
- Opportunity for consistent, constant flow of the recycling message

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): The City can partner with Hamilton County, Green Umbrella and Rumpke for the creation and promotion of its marketing campaign. Each of the goals identified within this recommendation can be carried out in the next one to two years. During this time, as well, continuous work to increase advocacy should be focused on in order to ensure the message from the marketing campaign is not forgotten after the marketing blitz is over. Form exploratory committee with market research firms.

Mid-Term (Three to Four Years): Building a collection of data and metrics from the marketing campaign in order to have more data to compare to understand the campaign's potential. Measuring its effectiveness and identifying what strategies were successful and which can be improved.

Green Cincinnati Plan – Waste Reduction Recommendations

Source Separated Organic Collection - Yard Debris & Food Scraps

What is it and why is it important to the City of Cincinnati?

Often yard debris and food scraps are discarded as trash when these items could be composted. According to the EPA there were about 3,090 community composting programs documented in 2010, a decrease from 3,227 in 2002. On a national level, yard debris accounted for approximately 14.6 percent and food scraps accounted for approximately 13.9 percent of all municipal solid waste (MSW – commercial and residential) generation in 2010 according to the EPA. Measured by percentage of generation, yard debris had one of the highest recovery rates in 2010 with 58 percent. Measured by percentage of generation, food scraps had one of the lowest recovery rates in 2010 with 2.8 percent. This recommendation will reduce the disposal of yard debris or food scraps through regular waste collection.

Residential Collection

Although the least energy intensive method to recycle yard debris and food scraps is to compost on site, many residences in the city of Cincinnati do not have yards that can handle all these materials. While the City should still promote backyard composting, separate organics collection by the City should be implemented to achieve Cincinnati's waste reduction goals.

The City of Cincinnati is well on its way to implementing separate organics collection. The introduction of the City's first Class 2 compost facility, Compost Cincy, provides a convenient, low cost location that can receive off site food scraps in addition to yard debris. The 2013 City budget reinstates biweekly residential curbside yard debris collection from April through November. Finally, a pilot curbside organics (food scraps and yard debris) collection program is being developed for 2014.

Currently it costs the City about \$25 per ton to drop off waste at the area landfill. A more viable option is to utilize Compost Cincy for drop off of yard debris and food scraps at a less expensive cost. Compost Cincy is able to utilize both yard debris and food scraps in its process to develop compost and soil amendments. Not only are the yard debris and food scraps being diverted from area landfills, but by using Compost Cincy to recycle these items, jobs are created throughout the process helping to stimulate the economy.

A curbside pick-up program could be an option to handle both food scraps and yard waste, which would be collected in one cart. This strategy would move the City toward the overall goal of having a three cart (waste, recycling and organics) system. In order to implement this system, a neighborhood area would be chosen as a pilot for the program. Once the program was tested and improved, the program could be rolled out to all neighborhoods.

GHG Emissions Impact

According to data from the City of Cincinnati, 89,685 tons of residential waste was collected in 2011. Results from the Hamilton County Waste Composition Study estimate that food scraps make up 19.6 percent or 17,578 tons of the residential waste generation per year.

Yard debris is estimated to make up 5.7 percent or 5,112 tons of residential waste generated per year in the city of Cincinnati. If all yard debris and food scraps were composted, the City would reduce greenhouse gas emissions by 8,734 MTCO_{2e} per year. (EPA WARM model v12) Part of this reduction is derived from the shorter hauling distance to the composting facility as compared to the landfill.

Commercial Collection

Many businesses have on site cafeterias for employees, which generate a significant amount of food scraps each day. Local restaurants also generate food scraps each day; however, there is usually not a uniform system to recycling these food scraps, especially in smaller restaurants. All CPS locations have a cafeteria which generates food scraps from the daily lunches.

There are already major local corporate partners, especially the Greater Cincinnati Green Business Council (GCGBC), leading the way in the recycling of food scraps. GCGBC created a Composting Toolkit designed specifically for companies to help guide in the development of workplace composting systems. Important information regarding composting basics, materials and supplies and low cost options are communicated in the toolkit. This resource should be disseminated throughout the commercial sector to increase knowledge of composting. The Composting Toolkit can be found on the GCGBC website: www.gcgbc.org.

Who will be the targets for this recommendation?

Residents, local businesses, schools and restaurants could be targeted for organics collection.

How can the City of Cincinnati influence the initiation of this recommendation?

The recommendation is for a city-run curbside yard debris and food scrap collection service because it will divert a more substantial amount of material than solely an education program or drop off program.

In anticipation of the rollout of City owned trash carts, the City of Cincinnati could encourage residents to use their existing trash cans as yard debris cans or to convert them into compost bins (<http://www.ca.uky.edu/enri/pubs/enri311.pdf>).

Is it feasible?

Potential obstacles to the yard debris and food scrap recycling recommendation could include:

- Changing habits of food scrap and yard waste disposal
- Lack of interest from local restaurants, businesses, etc.
- Lack of space for some residents/businesses to compost
- Cost of transportation

How much would it cost?

- Educational strategies to teach people to compost
- Collection and processing fees

- New land needed for composting or additional land for CompostCincy
- Less natural gas from the Rumpke landfill

Are there other positive impacts?

- Yard debris could be used for making mulch/fertilizer to be reused
- More jobs from composting rather than landfilling
- Source of compost for local farms and rain gardens

Are there possible unintended impacts?

- Improper management of food scraps can led to health issues around vermin and disease

Timeline for Implementation

Short-Term (One to Two Years): An initial pilot program will be implemented. The collection of yard debris was included in the 2013 City Budget. Yard debris will be separately collected from April through December. Food scraps collection can be piloted in 2014, for expanded implementation in 2015.

Green Cincinnati Plan – Waste Reduction Recommendations
Electronic Waste Collection

What is it and why is it important to the City of Cincinnati?

The City of Cincinnati would implement a program for electronic waste collection, such as TVs, computers and other electronic appliances. This program would include implementing neighborhood-organized drop offs and promoting Hamilton County’s drop off system, a system, which is already in place where the county pays for the materials to be recycled. Details about the current Hamilton Country drop-off include:

Source: <http://hamiltoncountyclecycling.org/index.php?page=computer-and-tv-recycling>

Location	Months Facilities Open	Hours of Operation
CSI/ Republic Transfer Station 10751 Evendale Drive Evendale, Ohio 45241	May 1 through October 31, 2012	Monday - Friday 10 am - 4 pm Second Saturday of every month from 10 am - 4 pm

Items Collected At No Charge:

TVs, CPUs, hard drives, personal copiers, docking stations, monitors, scanners, printers, cellular telephones, tape and disk drives, tapes (VHS, Beta, Cassette, 8-track) VCR and DVD players, circuit boards, cables, mainframes, servers, terminals, fax machines, PDAs, back up batteries, chips, keyboards, mice, modems, computer speakers, CD Rom drives, and laptops

Although promoting the current drop-off location should be included in the plan to help increase awareness and diversion of e-waste, the location and time of operation are inconvenient to some residents. As Evendale is not located within Cincinnati and is not easily accessible by public transit, the county’s current location for e-waste drop-off is hard to reach for many residents. The months the facility are open and the hours of operation are also inconvenient for many people. Another drop-off facility, which is more accessible to residents living within the city limits, could increase the likeliness these people would participate in e-waste collection. Expanding the months of operation to coincide with popular times of e-waste generation, such as after the holiday season, could help boost the collection rate. The hours of operation could also be expanded to accommodate after work drop off. To combat one of these issues, Hamilton County Recycling and Solid Waste District has been working to implement two locations to make e-waste collection more convenient for residents.

Expanded e-waste collection would result increased e-waste collection rates because there currently is no unified or convenient program. In addition, there is a current security risk for Cincinnati residents trying to dispose of e-waste that holds confidential personal information because there is no organized program to ensure all electronics holding personal data would be safely and securely disposed of.

The U.S. Environmental Protection Agency Office of Resource Conservation and Recovery estimated that in 2009:

<http://www.epa.gov/epawaste/conservation/materials/recycling/manage.htm>

- 438 million new electronic products were sold
- 5 million tons of electronic products were in storage
- 2.37 million tons of electronic products were ready for end-of-life management
- 25 percent of these tons were collected for recycling

According to the EPA's Electronic Waste Management in the United States through 2009 Executive Summary, there has been an increase in the sales of electronic products, with the largest being in mobile phone sales from 216,100,000 in 2009 to 235,600,000 in 2010. The average lifespan of a wireless phone is 18 months. Phones are being discarded at a rate of 125 million phones a year, which results in over 65,000 tons of wireless waste.

Source: <http://www.epa.gov/epawaste/conserve/materials/ecycling/docs/summarybaselinereport2011.pdf>

Currently, the EPA estimates each American household owns about 24 electronic products that eventually will become e-waste. The lack of knowledge on how to properly discard these products is a major issue in reducing unnecessary waste in the landfills of Cincinnati.

Who will be the targets for this program?

This recommendation focuses on increasing residential e-waste disposal. Businesses must either recycle computers and other e-waste or be considered a generator of hazardous waste under the Resource Conservation and Recovery Act (RCRA). Due to components such as lead, cadmium, or chromium in computers, they can be considered hazardous material (Ohio EPA www.epa.state.oh.us/ocapp/p2). RCRA; however, does not cover residential generation and disposal of e-waste so residents can legally set out their computer or other e-waste with their trash. The e-waste recycling program should reach as many residents as possible by making the pick-up locations accessible near public transit routes so those residents without cars can still participate.

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati can work with neighborhoods and local businesses to organize e-waste collections, especially in January after the holiday season when a lot of electronics are purchased and there is a need for disposal of the old. Working with neighborhoods and local businesses will be a more efficient way to reach targeted groups of residents and allow for convenient locations for e-waste pickup/drop-off for residents. Additional benefit can come from partnering with the Hamilton County Recycling and Solid Waste District to host and organize such events.

The City of Cincinnati could launch a campaign to educate residents on which materials are eligible for e-waste recycling. Increasing awareness of how harmful these products can be to the environment should be emphasized in the campaign. The marketing campaign should include retail partners such as Best Buy, HH Gregg or Circuit City. By partnering with businesses, this allows for a network of more convenient locations for e-waste drop off to form in order to increase the number of residents the program is able to serve. In addition to businesses, the City should continue to support its partnership with collection

events through KCB America Recycles Day at Whole Foods and Cincinnati Reds Players for the Planet Collection on Earth Day. Both of these events were successful in their efforts. The numbers from the Players for Planets include:

Location	Pounds Collected
Anderson Township	65,000
Hyde Park	80,000
Newport	50,000

While there may be a fee involved, the city of Cincinnati could look to further utilize this resource through partnering to hold joint collection events. The e-waste recycling business is becoming more and more competitive. [Cohen Recycling](#), headquartered in Middletown, Ohio is also accepting e-waste at its retail recycling locations - two of which are convenient to City of Cincinnati residents. Several retail chains are also offering extensive recycling service including [Best Buy](#) and [Staples](#).

List of Retail Outlets Accepting E-waste

- Westwood - Best Buy - 5555 Glenway Ave Suite 550 Cincinnati, OH 45238
- East End - Cohen Recycling - 4538 Kellogg Ave Cincinnati, OH 45226 513-321-3218
- Norwood - Cohen Recycling - 5038 Beech St Cincinnati, OH 45212 (513) 731-7222
- Pendleton - Staples - 1400 Reading Road Cincinnati (513) 651-5739
- Oakley - Staples - 3808 Paxton Avenue Cincinnati (513) 321-5777
- Westwood - Staples - 6180 Glenway Avenue Cincinnati (513) 481-3978
- Bond Hill - Habitat for Humanity - 4910 Para Dr. Cincinnati Ohio 513-621-4147

Map of these outlets can be found on the following site: <http://goo.gl/maps/MNvbs>

The City of Cincinnati can also join an e-Steward program, which pledges to use recyclers who ensure social responsibility and safer disposal of e-waste on all levels of the process. More information on how to become an e-Steward recycler can be found here: <http://e-stewards.org/certification-overview/how-to-become-an-e-stewards-recycler/>

The City of Cincinnati should also consider discontinuing free collection and landfill disposal of e-waste. This is the practice of most cities because it is the most convenient option.

What is the Amount of E-Waste Diverted from Landfills?

In the U.S., approximately 11 to 14 percent of e-waste is sent to recyclers. In Cincinnati in 2011, there was 89,685 tons of waste sent to the landfill and one percent of this was classified as e-waste according to the Hamilton County Waste Composition Study. This means there was approximately 896 tons of e-waste from City residents was deposited in local landfills in 2011.

Greenhouse Gas Impact

According to EPA's Waste Reduction Model (WARM) v12 recycling 896 tons of "personal computers" would result in a GHG emission reduction of 2,137 MTCO_{2e}

Is it feasible?

Potential obstacles to the e-waste recycling programs could include:

- Lack of knowledge of program if it is only periodic pick up
- Incentive for residents to participate because it is too easy to just throw the e-waste away as they have before since they are not legally obligated
- Effective, efficient way of reaching all residents in the City of Cincinnati is very costly

How much would it cost?

Computers and electronics require skilled laborers and specialized equipment to disassemble for recycling or refurbishing, meaning the process usually has associated costs. However, many of the metals in computers have a very high value and help cover the cost of disassembly. Several Greater Cincinnati companies have computer recycling capabilities that could be utilized.

There are additional costs associated with whether e-waste collection is picked up from residents' homes or residents bring the e-waste to a facility. E-waste pickup will require resources such as employees and transportation for the waste. The facility to dispose of the e-waste will require resources such as a building, employees, equipment and security.

Are there other positive impacts?

- Reduced hazardous waste from these products in landfills
- Job creation through program pick up or refurbishing of products
- Increased space in area landfills and make the landfills less toxic
- Possibility to donate refurbished electronic items
- Safe disposal of electronics which may hold residents' personal information

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): Hamilton County and the City need to be more aggressive partnering together in this effort. In 2013, Hamilton County Recycling and Solid Waste District plans to expand to two locations for e-waste drop-off to make it more convenient for residents.

Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): There needs to be efforts to continue to build the availability and accessibility of e-waste drop-off locations to encourage residents to properly dispose of their e-waste items.

Green Cincinnati Plan – Waste Reduction Recommendation

Commercial Recycling Program

What is it and why is it important to the City of Cincinnati?

The City of Cincinnati's Commercial Recycling Program would be a partnership between the commercial sector and the City to introduce or increase recycling within commercial businesses. Many commercial businesses have not implemented a recycling program or do not fully utilize their current recycling program.

According to county records, about two-thirds of waste in local landfills is a result of waste from the commercial sector. This makes the commercial sector a key focus for recycling enhancements. The first waste components targeted may be paper and cardboard as approximately 40 percent of waste in area landfills is compiled from these items.

In 2011, the residential sector of Cincinnati produced about 89,685 tons of waste according to statistics from the Hamilton County Recycling and Solid Waste District. The waste produced by the residential sector represents about one-third of the total waste sent to area landfills. This means approximately 179,370 tons of waste sent to landfills is produced by the commercial sector of Cincinnati. If approximately 40 percent of the waste discarded in the local landfill is paper and cardboard, two-thirds of this 40 percent should be attributed to the commercial sector, which accounts for approximately 26.67 percent of the total waste from the commercial sector. According to these statistics, 26.67 percent of 179,370 tons is 47,837 tons of waste, which consists of paper or cardboard. This is a significant amount of waste in area landfills, which is why it is recommended the City of Cincinnati focus on diverting these materials. Cardboard and paper are easily recyclable and will help eliminate a fair amount of greenhouse gas emission in the area annually; therefore, adding to improvements in the quality of life for the Cincinnati region residents.

The county has started the effort to increase the number of commercial businesses participating in the recycling program. Over the past six months, 42 recycling programs have been set up in the commercial sector throughout Cincinnati. The county has found it more effective to work with property managers of buildings in which companies are located as opposed to trying to target individual businesses. This tactic should be resumed to continue to promote this program as it is rolled out.

Who will be the targets for this program?

The three sectors within the City that should be targeted for this project include:

- Public sector: government services, colleges, universities, and schools
- Industrial sector: manufacturing plants, distribution centers, and warehouses
- Service sector: corporate offices, hospitals, medical centers, hotels, restaurants, shopping centers, and banking institutions

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati should create an initiative to implement recycling programs within each of its buildings. By implementing a recycling program for itself, the City is leading by

example and will also be able to provide tangible evidence as to how a commercial recycling program can be influential and beneficial within a business setting.

In order to increase the number of commercial sector members willing to implement recycling programs in their buildings, it will be important for the City to have solid figures for how this can be financially beneficial to each organization. By showing these organizations the cost savings aspect of a recycling program, this will help legitimize the need for program and increase the organization's invested interest in starting a program.

The City's new Commercial Waste Franchise System is a starting point for launching an enhanced commercial recycling program. Authorized commercial waste franchisees must offer recycling to their solid waste customers. The City should continue to survey other communities who have successful recycling systems for the commercial sector for lessons and guidance. The City of Cincinnati could launch a marketing/educational campaign to local commercial businesses communicating the importance of implementing a recycling plan to enhance the Commercial Waste Franchise system already in place. The campaign would include information regarding the benefits, costs, and savings that would be direct results of participation from institutions within the commercial sector.

Under the new Commercial Waste Franchise System, the City of Cincinnati may authorize up to eight commercial waste franchises for commercial waste collection and recycling within the city. This will result in more efficient routes and obtaining economies of scale, reducing fuel consumption and vehicle emissions. The elimination of City commercial waste pickup and institution of a commercial franchise system will also help incentivize increased recycling as a way of reducing waste disposal costs.

Is it feasible?

Potential obstacles to the commercial recycling programs could include:

- Resistance from employees to participate due to waste habits
- Cost

How much would it cost?

- Educational campaign to encourage participation – at least \$3 needed per business for a mailing
- Providing bins or containers to hold recyclable materials
- Cost of the pickup service (trucks, employees, etc.)
- Possible extra fee to businesses if City provides pickup

Pick up options with different cost structures for the businesses include:

- Self-haul, business subscribes to haulers, arrange for pick up of materials by city or business subscribes to a recycling service

Are there other positive impacts?

- Cost savings for the businesses with reduction in waste

Are there possible unintended impacts?

- Disgruntled businesses if new recycling policies issued

Timeline for Implementation

Short-Term (One to Two Years), Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): The City needs to partner with local businesses, GCGBC, Hamilton County, Rumpke, Republic, Bavarian, Forest Green, etc. to promote and encourage recycling in the commercial sector.

Green Cincinnati Plan – Waste Reduction Recommendation Develop Markets for Residential Recyclables

What is it and why is it important for the City of Cincinnati?

Recycling means business. Recycling, reuse and waste reduction are not only environmental tools, but also economic development tools, which can be used to grow the Cincinnati region’s economy. When properly collected, discarded materials are valuable resources leading to local revenue, job creation, and business expansion. The Institute for Local Self-Reliance (ILSR) estimates that on a per-ton basis, sorting and processing recyclables alone sustain 10 times more jobs than landfill operations or incineration. The largest economic pay-off; however, is creating new products from the old because the job intensity is higher in product reuse than in the recycling process.

ILSR Job Creation Statistics: Reuse, Recycling and Disposal

Type of Operation – Product Reuse	Jobs per 10,000 Tons/ Year
Computer Reuse	296
Textile Reclamation	85
Misc. Durables Reuse	62
Wooden Pallet Repair	28
Recycling-based Manufacturers	25
Paper Mills	18
Glass Product Manufacturers	26
Plastic Product Manufacturers	93
Conventional Materials Recovery Facilities	10
Composting	4
Landfill and Incineration	1

Recycling is also important to improving the quality of life in Cincinnati. An increase in the recycling rate stimulates the need for job creation in reuse industries, which utilize the recycled materials and is also directly linked to waste reduction. Reuse of recycled materials in the region will help decrease the negative effects of sending usable materials to landfills. The negative effects from landfills include groundwater pollution, monitoring and remediation costs and green house gas emissions.

Recycling can bring economic development opportunities to the Cincinnati region. Many materials such as paper, steel and aluminum have well-developed markets, which can be taken advantage of to attract manufacturers who can use these products to the region. There are also opportunities in emerging markets such as plastic, which the region could take more initiative in keeping these recycled materials to be reused in the area instead of sending it away to other locations.

A regional example involving the lumber market is TimberTech – an alternative decking material manufacturer. In April 2004, TimberTech broke ground in Wilmington, Ohio, for construction of a 140,000 square foot manufacturing and warehousing facility which added more than 200 jobs. TimberTech uses 107 million pounds of post industrial wood flour and post consumer plastic annually to make TimberTech products.

Opportunities with pacnext on food packaging – Kroger and P&G?

Who will be the targets for this program?

All industries that can use these recycled products to help make new products. Rumpke can also be targeted as a partner in best practices for this recommendation and how to implement these strategies effectively.

Below is a chart of companies, including local examples, currently using recycled materials as part of their business model. This chart can be a resource to better identify target industries for this recommendation.

Ohio's Recycling Market		
Recycled Material	Company Reusing Material	How Material Reused
Glass	Johns Manville	Fiberglass insulation products
	Owens Brockway Glass Containers, Inc.	Containers (mayo, jelly, etc.)
Newspaper	Rock Tenn	Magazines, textbooks
	Resolute Forest Products	Newsblank
Mixed Paper	Pratt Industries	
Office Paper	Cascade	Commercial Paper Towels
Cardboard	Cincinnati Paperboard	Rolls
	Rock Tenn	Lines board for new boxes
PET (Plastic #1)	Signode	Strapping
	Mohawk Industries	Carpet
HDPE (Plastic #2)	Haviland Drainage Company	Drainage Pipe
Plastics #3-#7	Quincy Recycling	
Aluminum Cans	Anheuser Busch	Can sheet

How can the City of Cincinnati influence the initiation of these programs?

- Identify land suitable for a green industrial park
- Provide incentives for businesses using recycled material to site themselves in Cincinnati
- Publicize the local availability of recycled feed sticks for industry

Is it feasible?

Potential obstacles to developing jobs around the recycling program could include:

- Possibility of high turnover in new jobs, require time to hire and train new employees

How much would it cost?

- Advertisement of new jobs created
- Job training and education
- Time spent in job creation, finding employees, etc.

Are there other positive impacts?

- Elimination of the need for some of the upstream phase due to conserving energy and reducing waste/pollution in the production of goods and services

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): The City needs to identify which markets it will initially target and work to attract economic development from the use of these recyclables.

Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): The City can take the lead to identify land suitable for a green industrial park, provide incentives for businesses using recycled material to site themselves in Cincinnati, and publicize the local availability of recycled feed stocks for industry.

Other potential sources:

<http://www.livestrong.com/article/140134-products-from-recycled-materials/>

<http://www.livestrong.com/article/127848-items-made-recycled-products/>

Green Cincinnati Plan – Waste Recommendation

Enhanced Management of City Waste

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on the opportunities within City government facilities to initiate strategies to help reach the goal of being a zero-waste organization. OEQ manages the recycling program for the City of Cincinnati's government facilities. According to the OEQ 2011 Annual Report, this program currently provides regular collection at 51 city locations and metals recycling at five locations. In 2011, the City's internal recycling program collected 737.8 tons of material, including 185.3 tons of paper and single stream recyclables; and 533.4 tons of metal. The collection of valuable metals and paper resulted in rebates of \$86,654 and \$7,482 respectively. Cincinnati also collects yard trimmings from the local parks which are brought to CompostCincy to be properly recycled. The City has recently engaged in efforts to increase e-waste collection. Annual e-waste collections are held to ensure proper disposal of the items. Through OEQ efforts with our partners the Hamilton County Recycling and Solid Waste District and local e-waste recycler, 2TRG, the City increased its amount of e-waste recycled from 14.0 tons in 2010 to 19.1 tons in 2011.

The previous figures illustrating results from the City's current recycling and waste management efforts show the City has been working to make it an important aspect of its organizational culture; however, there are still opportunities for improvement in the system and practices used. Although there are numerous facilities participating in regular collections, the City needs to work to expand the program to include all City facilities. As only five locations have metal recycling, more research can be completed to identify potential facilities that would be eligible to participate in this program. Increasing the number of facilities involved in recycling paper and metal is also a great way to increase revenue for the City government as rebates are given based on the amount collected.

In addition to increasing the number of facilities involved, the City also can work to improve its system for e-waste collection. With the current voluntary e-waste drop-off option available, the City has the opportunity to make this system more prevalent in its government facilities to increase the amount of e-waste collected. The City could also take on more extreme methods such as fighting for legislation changes in this area. According to Austin's 2011 Resource Recovery Master Plan, the City plans to take an active role in advocating for legislation requiring product manufacturers, retail establishments, wholesale distributors and other appropriate entities to take back certain products or packaging that currently are difficult to recycle or harmful to dispose.

Source: http://austintexas.gov/sites/default/files/files/Trash_and_Recycling/MasterPlan_Final_12.30.pdf

The City's effort to collect and compost yard trimmings from the local parks has resulted in a successful program. The composting of food scraps; however, still needs a solid system within City facilities. One recommendation is to create legislation around this issue making it mandatory for City facilities to compost food scraps. In San Francisco similar action was taken with all businesses. The legislation states: Property owners/managers (of apartments, condos, TICs, food establishments, events etc.) are required to provide color-coded, labeled containers in convenient locations: blue for recycling, green for composting, and black for trash. It is also the business owner's responsibility to educate tenants, employees, contractors, and/or janitors on what goes in each container. Food vendors that provide disposable food service ware or to-go containers must have blue, green, and black containers for use by customers and visitors, placed inside near a main exit. Legislation such as the one from San Francisco could be beneficial and effective for Cincinnati.

Source: http://www.sfenvironment.org/sites/default/files/editor-uploads/zero_waste/pdf/sfe_zw_mandatory_fact_sheet.pdf

Who will be the targets for this program?

All government facilities and organizations will be targeted to increase the efficiency and effectiveness of waste management. There should be consistent protocol and methods of recycling and waste management at government facilities to ensure the best probability for improving results in the future.

Due to their size, City firehouses and recreation centers should be specifically targeted to lead in implementing and promoting the best practices for recycling. By targeting these organizations, this will help reach a greater amount of people at one time and allow for the greatest chance to collect more waste since it aims to reach numerous facilities. Below are current numbers for each facility:

Firehouses	26
Recreation Centers	24

<http://www.cincinnati-oh.gov/fire/about-fire/>
<http://www.cincinnati-oh.gov/recreation/recreation-centers/>

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati will take the lead on this plan by carrying out implementation of the enhanced waste management strategies detailed in this recommendation. It is important for the City to take an active and lead role in committing to use of best practices in this area to continue to move towards the goal of becoming a zero-waste city.

The City of Cincinnati can also help in the implementation of this program by changing its procurement rules to have a policy such as the City only buying items that are easily recycled.

Is it feasible?

Potential obstacles to achieving this recommendation include:

- Approval of legislation
- Ensuring enforcement and consistency of new policies in all facilities

How much would it cost?

- Cost to expand program (additional bins, employees, trucks if necessary)
- Education to employees on new policies

Are there other positive impacts?

- Revenue incentive (paper and metal recycling)
- Leadership in waste management by example
- Environmental impact from diverting waste and increasing the recycling and reuse process

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): Within the next one to two years, recycling in each City building and facility can be enforced. Publicity of this initiative should be done to provide the public with information on how the City is trying to lead in recycling efforts.

Green Cincinnati Plan – Waste Recommendation

Reduce waste by discouraging single use items like plastic bags and Styrofoam

What is it and why is it important to the City of Cincinnati?

Everyone has heard the saying, “Reduce, Reuse, Recycle.” Reducing the generation of waste should be the starting point of every waste management program. Proliferation of single-use plastic items such as plastic bags at the marketplace and Styrofoam cups creates a hazard to local and global ecosystems. Plastic takes thousands of years to degrade which means it becomes a nearly permanent environmental problem when it is littered. The plastic finds its way into our water sources and natural environment. This recommendation suggests that the City of Cincinnati investigate options which decrease local consumption of single-use plastics.

It is estimated that 12 million barrels of oil a year are used for U.S. plastic bag consumption. This diversion of resources goes towards production of a product which emits toxic pollution at every stage of its existence: from manufacture to use to disposal. Other communities which recognize this danger have implemented plans which range from a five cent fee for plastic bag use to an all out ban in San Francisco. To reduce damage to the environment, the City of Cincinnati should investigate plans which reduce local consumption of single-use plastics.

In order to calculate the viability of a citywide reduction in single-use plastics, the City of Cincinnati could:

- Create a waste reduction committee or task force
- Conduct a study which assesses the impact that reduction plans have had on other communities
- Survey residents and businesses on attitudes toward a reduction plan
- Establish consumption reduction goals for the City

Information is required for the City of Cincinnati to determine if options for reduced use of single-use plastics are economically sustainable and feasible for the City’s population.

Examples of single-use plastic reduction plans

Five Cent Fee

Many cities and communities have imposed a small fee for continued usage of plastic bags at stores. The fee is the cost of purchase of the plastic bag should the consumer decide not to use reusable bags. This fee draws attention to the dangers associated with a “throwaway” society and incentivizes the use of reusable bags while shopping. An inconvenience is placed on the consumer to prompt them to act sustainably. Such fees are sometimes limited to stores larger than a specific size, or stores of specific types (supermarkets and drug stores).

Bag Ban

Successful in some cities, places like San Francisco and other Californian cities have implemented a ban on plastic bags in supermarkets and drugstores. This ban dramatically

reduces the use and disposal of single-use plastic and addresses a serious concern for coastal cities—plastic litter and environmental damage. The ban results in increased usage of reusable items which decrease the amount of plastic sent to landfills and in the environment.

Incentivize Reusing Plastic Bags and Use of Reusable Bags

One option outside of imposing fees or bans on consumers would be a plan that rewards consumers for using reusable or old plastic bags when shopping. A point system, price reduction, or other mechanism could be used that would encourage Cincinnatians to reuse their old bags or switch over to reusable bags. The overall impact would be a reduction in the plastic proliferated and an increase in environmental awareness and protection efforts.

Who will be the targets for this recommendation?

This recommendation would primarily affect the waste habits of greater Cincinnati residents and businesses. A successful plan for reduction in single-use items would need to include participation from consumers and the supermarkets, drugstores, retailers, etc. that utilize plastic bags on a daily basis.

How does it affect GHG emissions?

Decreased plastic usage reduces reliance on fossil fuels which are used for production and decreases the amount of toxins emitted from plastic in landfills.

How can the City of Cincinnati influence the initiation of a reduction plan?

The City of Cincinnati can support programs which encourage using reusable bags, recycling, and environmental awareness of everyday choices. Further, the City can also partner with groups such as Cincinnati Past Plastic to investigate possible policies and procedures for a reduction in plastic consumption. Because a policy would most likely impact supermarkets and drugstores, coordination with these groups should occur to ensure a smooth implementation process.

Is it feasible?

Obstacles to achieving this plan include:

- Lack of commitment to reducing plastic usage from City consumers and producers
- Education—City residents and businesses would need to be educated on the effects of single-use plastics and sustainable solutions
- Development of a citywide plan
- Enforcement of a plan's requirements for the City

How much would it cost?

- A fee for plastic bags would cost consumers \$.05/bag, and might produce a new revenue stream for retailers.

Are there other positive impacts?

- Creates a cleaner environment for citizens
- Reduces the amount of plastics that could potentially be littered in Cincinnati

- Decreased toxins emitted into the ecosystem

Are there possible unintended impacts?

Possible backlash could come from companies which use plastic bags to reduce corporate costs. Further, requirements could be viewed as an inconvenience to shoppers and bag manufacturers who rely on plastic bag usage daily. Also, in some cases health issues have been raised over reusable bags. There would need to be adequate education on the necessity of washing reusable bags to counteract sickness which can result from bacteria from foods like meat that are placed in reusable bags.

Timeline for Implementation

Short-Term (One to Two Years): Assess local feasibility

Mid-Term (Three to Four Years): Adopt the assessment's recommendation

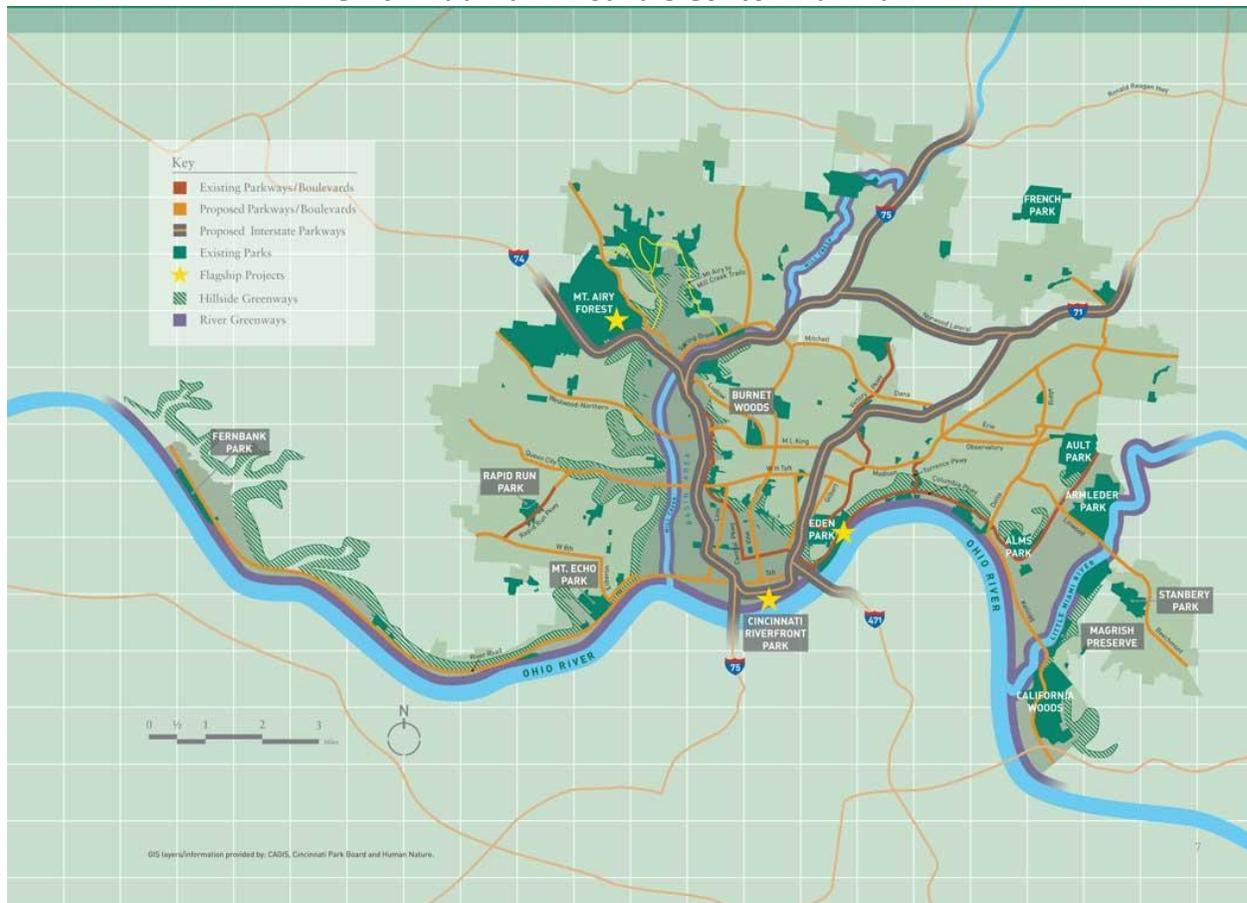
Green Cincinnati Plan – Land Management Recommendation Preservation and Management of Natural Corridors

What is it and why is it important to the City of Cincinnati?

The purpose of this recommendation, focusing on preservation and management of natural corridors, is to promote a plan to protect, preserve, and manage the natural corridors and greenspace in the region. This plan will help to identify potential natural corridors, often along hillsides and streams, to help preserve the area's green infrastructure.

Cincinnati's natural environment has strongly influenced the development and urbanization of the city throughout its history. These natural corridors provide the city with environmental diversity and continue to be vital components in the social and economic development of the region today. Preservation, conservation, and restoration of natural resources, along with sustainable development, encourage residents and businesses to stay and promote investment in the region's future.

Cincinnati Park Board's Centennial Plan



Hamilton County's Greenspace Concept Plan and Cincinnati Park Board's Centennial Plan lay the foundation for accomplishing the key concepts of this recommendation. These plans

identify our most important greenspaces; those that merit the highest priorities for preservation and restoration. They can be used as a base to grow a more comprehensive plan to include additional natural corridors throughout the region. Currently three greenways and two greenbelts from these plans are located in the city. These corridors must now be managed to ensure their preservation is continuously upheld.

Identified Corridors:

- Little Miami River Greenway (http://www.littlemiami.com/index_files/Page387.html)
- Mill Creek Greenway – Groundwork Cincinnati (<http://groundworkcincinnati.org/>)
- Ohio River Greenway – Bike trail to the East, greenway to the west – Western Wildlife Corridor (<http://www.westernwildlifecorridor.org/map.htm>)
- I-74 Greenbelt – The Land Conservancy Hamilton County (http://www.landconservancyhc.org/I-74_Greenway.htm)
- Duck Creek/Bloody Run Greenbelt

What areas will be the next targets for this program?

Although several natural corridors have been identified and are currently being managed, there is still an opportunity to target other natural corridors and identify these as vital to our region so they can become priorities for restoration as well. Below are potential corridors, which could be targeted to expand the program:

- Duck Creek
- Little Duck Creek
- Lick Run Greenbelt
- West Mill Creek Hillside
- East Mill Creek Hillside & Basin ring
- Spring Grove/Mt. Airy Park

Who are potential key partners to achieving this program?

- Green Umbrella Land Management Action Team
- Cincinnati Park Board
- Hamilton County Parks District
- Land Conservancies
- Groundwork Cincinnati – Mill Creek, formerly the Mill Creek Restoration Project
- Metropolitan Sewer District
- Hillside Trust
- Western Wildlife Corridor (WWC)
- *Millcreek Valley Conservancy District*

How does it affect GHG emissions?

Preserving greenspace corridors provides opportunities for carbon sequestration and non-motorized travel.

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati can support any initiatives in relation to this plan by passing and enforcing regulations to protect natural resources (such as Hillside Development

Regulations) and by acquiring property through the Hamilton County Land Bank or through initiatives like MSD's Project Groundwork. The City can also support or work with all potential key partners identified in this recommendation. There is also an opportunity for the City to be influential in this program in regards to handling trusts and endowments for perpetual maintenance of green space.

Is it feasible?

Yes, but potential obstacles to expanding this program include:

- Cost
- Ensuring communities see the need to preserve these corridors
- The capital nature of the development of greenways makes this a longer term proposition. The Hamilton County Reutilization Corporation (Land Bank) may help in the assembly of these parcels.

How much would it cost?

There are some available resources currently in place to assist with this plan. A broad base of community support for preservation, restoration and conservation is reflected in the passage of the Ohio Conservation Fund in 2000, and, locally, in Hamilton County residents' support for the 2002 15-year, 1-mill replacement park levy. This levy gives Hamilton County Park District's (HCPD) Green Space Preservation Projects resources to add critical lands to existing parks and connect existing and proposed parklands to achieve multiple compatible objectives. Objectives include promoting naturally functioning ecosystems, floodwater management, reduction of air and water pollution, wildlife habitat protection and creation, and the preservation of open space. An evaluation of the total cost needs to be completed. Once the total cost is identified, an analysis of available funds should be done to see if these resources are enough or if additional funding needs to be found.

Are there other positive impacts?

Like the region's roads, greenspaces are a shared resource, connecting communities across political boundaries. Planning for greenwoods, greenways, and greenbelts as defined in the Hamilton County Greenspace Concept Plan promotes preservation and conservation of our uniquely beautiful, diverse landscape throughout the city. Preserving natural corridors in the region also helps keep our green landscape

Source for Hamilton County Greenspace Concept Plan:

<http://www.hamiltoncountyohio.gov/hcrpc/compass/reports/17/greenspace.pdf>

Through the preservation and management of natural corridors, this also presents an opportunity for natural or wildlife corridors between parks and greenspaces.

Are there possible unintended impacts?

There is an opportunity cost based on what the land could be used for instead of identifying it as a natural corridor that is eligible for protection and preservation.

Timeline for Implementation

Short, Medium and Long Term, (One to Six Years): The City can pass and enforce regulations like the Hillside Protection Ordinance. Acquire property through the Hamilton County

Land Bank or through initiatives like MSD's Project Groundwork. The City can partner with other land preservation organizations to protect designated greenspaces.

Green Cincinnati Plan – Land Management Recommendation Urban Forestry

What is it and why is it important to the City of Cincinnati?

Urban forestry focuses on caring for and managing the tree population in Cincinnati in order to improve the urban environment and infrastructure. This recommendation is essential to ensuring there is aggressive planting of native, pest resistant and where appropriate, productive trees. Although the goal is to plant native species of the area, it is important to include a variety of tree species in order to avoid a monoculture. The recommendation also focuses on the importance of increasing canopy coverage by planting trees.

The City of Cincinnati currently has a Forestry Program, which is highly regarded. As of 2011, the program had achieved the Tree City USA Award for 30 consecutive years and the Tree City USA Growth Award for the past 16 years.

This recommendation will help the City continue down its path of excellence by taking advantage of the opportunity to further improve the environmental, natural facade of Cincinnati. There should be a focus on special efforts to eradicate invasive species that are harmful to the City's urban tree population. Some of the most invasive insect and plant species identified, which pose the largest threat to the City's tree population include: the Emerald Ash Borer, Gypsy Moth, Asian Long Horned Beetle, bush honeysuckle and Callery pear trees. These species must be kept under watch to ensure they are properly managed and do not overtake the current urban forestry in place.

Who are potential key partners for this recommendation?

- City of Cincinnati Park Board's Urban Forestry-Natural Resources Management

The Park Board's Urban Forestry Program is responsible for planting, maintaining, and protecting over 85,000 street trees on 1000 miles of streets. The program has been operating since 1981 with funding provided by an annual assessment. In addition, this organization is responsible for park tree operations, land management and greenspace management within the corporate limits of the City of Cincinnati.

- Hamilton County Park District
- Urban Forestry Advisory Board
- Volunteer groups who help manage invasive species
- Western Wildlife Corridor
- Sierra Club

Who will be targeted for this recommendation?

All areas and communities with the land resources to promote urban forestry improvement and expansion will be targeted for this recommendation. Specifically, areas with appropriate tree canopy should be targeted for maintenance and combating invasive species. Areas without the appropriate canopy should also be targeted for reforestation.

How can the City of Cincinnati influence the initiation of these programs?

Each year there is a street tree assessment. The assessment is authorized by the State of Ohio and must be levied annually by Cincinnati City Council. The City can ensure they are supporting the efforts of urban forestry and promoting its importance throughout the community.

The City of Cincinnati can work with the potential key partners to identify and implement areas for tree maintenance, tree planting and combating invasive species.

Is it feasible?

Potential obstacles to expanding this program include:

- Lack of funding
- Competing demands for land
- Lack of public awareness about the benefits of healthy urban forests

How much would it cost?

There is a current “tree tax” in Cincinnati to help pay for urban forestry efforts. The 2011 Park Board’s Urban Forestry Program’s assessment was approved by Cincinnati City Council at the rate of \$0.18 cents per front foot (lowest in the state) on all property that abuts public right of way within the city. The assessment was authorized by Section 727.01.1 of the Ohio Revised Code and was for the sole purpose of “planting, maintaining, trimming, and removing shade trees.” The average lot in Cincinnati is 50’ wide and would owe \$9.00 annually for tree assessments. This “tree tax” generated \$1.8 million and this produced an annual return of \$4.44 for each dollar in assessment funds from the taxpayer’s initial investment. This shows this program also provides an economic benefit to the City as more money is generated from this program than initially invested by the taxpayer.

The Green Cincinnati Plan recommends increasing this assessment (14 cities in Ohio have the assessment – some at higher rates). Cincinnati’s is among the lower amounts, compared with Shaker Heights at \$1.16 per foot, Toledo at 52 cents per foot, Cleveland Heights at 50 cents per foot and Greenhills at 35 cents per foot.

<http://news.cincinnati.com/article/20110609/NEWS0108/106100340/-Tree-tax-may-next-city-s-chopping-block>

Source: <http://cincinnati.com/blogs/letters/2011/06/30/cincinnati-urban-forestry-program/>
<http://city-egov.cincinnati-oh.gov/Webtop/ws/council/public/child/Blob/32990.pdf;jsessionid=5B0781025A6EEDB8C584FE15ABED3FB?m=31865>

Are there other positive impacts?

Not only does urban forestry promote the planting of native plants and help eradicate invasive species that can harm the City’s trees, but there are many environmental and economic benefits brought to the City as well. Among these are energy benefits in the form of reduced air conditioning by shading buildings, homes and roads, absorbing sunlight, reducing ultraviolet light, cooling the air, and reducing urban heat islands and wind speed. There are also economic benefits associated with urban trees such as increased land, property, and rental value. Well-maintained trees and landscaped business districts have been shown to encourage consumer purchases and attract increased residential,

commercial and public investments. Urban forests also improve air quality, absorb rainwater, and improve biodiversity.

Source: http://en.wikipedia.org/wiki/Urban_forestry

More trees mean more leaves and more yard debris which can be composted into soil amendments. The Waste chapter of this plan recommends management of organic wastes like yard debris; the Food chapter recommends using compost as a soil amendment in gardens; and the Water chapter recommends using compost to increase the organic content of soil in rain gardens.

Without trees, public utilities would have to construct more facilities to handle peak stormwater flow. Studies show that reduction in our forest greenspace by just ten percent, from 30 percent to 27 percent of the land area, would cost taxpayers at least an additional ten million dollars per year.

Are there possible unintended impacts?

- Air quality – net effects (biogenic volatile organic compounds, aeroallergens)
- Infrastructure – root conflicts with sidewalks and curbs and gutters, trees in power lines, visibility of signage, addition to sanitation and solid waste stream, etc.
- Energy – attenuation of solar access to dedicated solar systems

Source: http://www.dnr.wa.gov/Publications/rp_urban_ufprotocol.pdf

Timeline for Implementation

Short-term (One to Two Years): Increase street tree assessment. Work with Green Umbrella Land Management Action Team to create tree planting guidelines that reflect invasive threat and climate change impacts.

Short, Medium and Long Term, (One to Six Years): Work Green Umbrella Land Management Action Team and OKI to improve/increase number of trees in the City and region

Green Cincinnati Plan – Land Management Recommendation

Continue Incorporation of Green Infrastructure into Road Right-of-Ways

What is it and why is it important to the City of Cincinnati?

This recommendation serves as an extension to the City’s Complete Streets initiative. Complete Streets are regulations that allow streets to be redesigned to focus on shared use with bicycles and mass transit as well as better conditions for pedestrians. The standards aim to improve walkability and slow traffic in business districts through strategies such as adding on-street parking, converting one-way roads to two-way traffic, and providing connections through smaller block sizes.

As an opportunity to improve Complete Streets, this recommendation calls to continue incorporating trees and green infrastructure into road right-of-ways to create not only Complete Streets but “green streets”. It is important to ensure the continuous inclusion of trees and green infrastructure as these areas provide environmental diversity to our urban right-of-way system and give Cincinnati a more pleasing aesthetic look and feel. Instituting this recommendation to improve the City’s **Complete Streets policy is important to the City because it will** ensure transportation planners and engineers consistently design and operate right-of-ways with an eye toward managing stormwater and incorporating native plants.

Important Aspects to Highlight in Green Streets Plan:

- Include [improved vision](#) for how and why community wants to complete its streets
- Plan needs to apply to [both new and retrofit projects](#), including design, planning, maintenance, and operations, for the entire right of way
- Include any new specific exceptions and has a clear procedure that requires high-level approval for additional exceptions to be added
- Ensure additions to original plan are adoptable by [all agencies to cover all roads](#)
- Detail improvements relating to incorporating [latest and best design criteria](#) and guidelines, while still recognizing the need for flexibility in balancing user needs
- Show how Green Streets solutions will [complement the context](#) of the community
- Establish [performance standards](#) with measurable outcomes for additions to plan
- Include [specific next steps](#) for implementation of the changes to the plan

What areas will be targeted for this recommendation?

Examples of Green Infrastructure Applications:

- Comer Alley in Over-the-Rhine

Unusually sandy/permeable soils underlie the entire site which provided the opportunity to use permeable pavers for onsite stormwater management. Local field tests indicate percolation rates ranging from 45 to 270 inches per hour in shallow soils. The alleys were constructed by salvaging, cleaning, and reusing historic clay bricks and granite pavers.

- Spring Grove Avenue

A linear rain garden was incorporated into the conversion of Spring Grove Avenue, between Mitchell & Clifton Avenues to a “Complete Street.” The 10,000 square foot garden

was constructed with 85 percent topsoil and 15 percent organic matter (peat) and an underdrain. Source: <http://capgin.osu.edu/proddetail.php?prod=4747spinggr>

- Oakley Square

Green stormwater management features for this area include several bioinfiltration planters, pervious concrete, and a bioinfiltration basin.

Source: http://projectgroundwork.org/downloads/ei/ei_interim_summary_12.2011.pdf

Who are potential key partners for this recommendation?

DOT, MSD, Departments of Health, local businesses, Cincinnati Park Board

How can the City of Cincinnati influence the initiation of these programs?

City Council can continue to support this initiative and work with local areas that are interested in participating in incorporating trees and green infrastructure into the right-of-ways in their area.

Is it feasible?

Potential obstacles to expanding this program include:

- Communities not receptive to including trees or green infrastructure
- Currently, few government agencies require roads to be green transportation corridors.

How much would it cost?

- Construction/planting
- Trees and other plants to incorporate a green infrastructure
- Maintenance

Are there other positive impacts?

- Water quality
- Water quantity
- Aesthetics
- Air Quality
- GHG reductions

Are there possible unintended impacts?

- Other uses for these areas of the right-of-ways
- Impacts to visibility
- Trash
- Increase in water table

Timeline for Implementation

Short, Medium and Long Term, (One to Six Years) Incorporate green infrastructure in road reconstruction.

Overall Resources:

<http://www.urbancincy.com/2012/05/cincinnati-moves-forward-with-city-wide-complete-streets-initiative/>

<http://www.smartgrowthamerica.org/complete-streets>

Green Cincinnati Plan – Land Management Recommendation

Use Native Low-Maintenance Plantings to Replace Mowed Areas

What is it and why is it important to the City of Cincinnati?

Many greenspaces in Cincinnati receive routine maintenance such as mowing and watering. These labor-intensive activities require City funding, and when budget times are tough, mowing and watering may be cut resulting in dead plants and overgrown eyesores.

This recommendation provides an opportunity for Cincinnati to reduce the amount of mowing required for greenspaces, thus reducing fuel consumption and exhaust emissions while also reducing the maintenance costs for the mowing.

The use of native plantings can also help eliminate the need for watering and maintenance. Native plantings require less water and maintenance than horticultural plantings. Native plantings can replace plantings that may have required daily watering - annuals for example – and may go without water other than natural rainfall for the entire year with the exception of extreme drought. Most established native plantings only require annual cutting back of past years dead growth, unless in a high profile area where occasional deadheading or weeding may be needed. This can save the City money and help increase the amount of native plants in the City's green infrastructure system.

Waukesha County, located in Minnesota, has been using native low-maintenance plantings to replace mowed turf on highways and medians since 2007. The county was able to reduce maintenance costs of certain medians by up to 90 percent. The grounds and site management plan from Waukesha County can be used as a base for how Cincinnati can start to implement this plan in our own region.

Source: <http://www.waukeshacounty.gov/defaulttwc.aspx?id=39255>

What plants should be used to replace mowed areas?

It is important for the City to properly identify native plants that can be used to replace the currently mowed areas and to ensure these plants are low-maintenance. Below are links to resources to identify some potential plants:

<http://www.cincinnatibirds.com/wildones/NATIVE%20GROUND%20COVERS.pdf>

<http://cincinnati.org/horticulture/native-plants/>

How can the City of Cincinnati influence the initiation of these programs?

A cross functional team within the city including representatives from Department of Transportation and Engineering, Parks, the Department of Public Services, Department of Public Works, Health Department, Stormwater and the Metropolitan Sewer District should be created to identify the areas that would be the best potential places for this recommendation to be implemented. The City can also work with specialists or organizations such as the Cincinnati Nature Center or Hamilton County Parks to properly identify which plants would be best suited for each identified area.

Another way to encourage more native landscapes is through ordinances that promote and protect natural areas. See Chapter 8 Natural Areas Establishment and Management from

Balanced Growth Ohio's Best Local Land Use Practices:

<http://balancedgrowth.ohio.gov/BestLocalLandUsePractices/BestLocalLandUsePractices2012.aspx>

Is it feasible?

Potential obstacles to expanding this program include:

- Identifying the best plants to be low-maintenance replacements
- Pushback from communities if they like the greenspace as it is

How much would it cost?

- Employees to plant
- Equipment to uproot grass or other ground cover in these areas
- Buying the plants
- [Prairie Nursery, Inc. of Westfield Wisconsin](#) estimated the annual maintenance cost of traditional lawn to be \$500/acre, while the average cost for prairie between \$100-200
- Maintenance

Are there other positive impacts?

- Beautifies roadsides by providing color & texture at all seasons
- Increased aesthetic appearance can increase businesses wanting to locate here
- Provides drought resistant vegetation
- Reduces surface runoff and erosion by improving infiltration
- Provides low maintenance weed control
- Provides lower cost roadside management by reducing mowing
- Enhances wildlife habitat for insects, reptiles/amphibians, birds, mammals
- Preserves our natural heritage

Source: http://www.kansasnativeplantsociety.org/roadside_management.php

- Reduces risk of mowing on hillsides
- Stabilizes hillsides to prevent landslides
- Help for implementing MSD Consent Decree
- The city's program can become a model for private property owners (see City's updated weed control ordinance - Ord. No. 149-2011)

Are there possible unintended impacts?

- Job loss: maintenance jobs no longer required for greenspaces
- Impact on motorist visibility
- Possible haven for trash

Timeline for Implementation

Short-Term (One to Two Years): The cross functional city team should be used to develop a plan to transition city land that is currently mowed to low maintenance native plants. Implementation will take longer as the transition takes place.

Medium and Long Term (Three to Six Years): Continue transition of mowed areas to incorporate native plants

Green Cincinnati Plan – Land Management Recommendation

Reduce Impervious Surfaces

What is it and why is it important to the City of Cincinnati?

Impervious surfaces are mainly artificial structures such as [pavements](#) ([roads](#), [sidewalks](#), [driveways](#) and [parking lots](#)) that are covered by impenetrable materials such as [asphalt](#), [concrete](#), [brick](#), and [stone](#). Impervious surfaces have many negative impacts on the environment, making this recommendation to reduce the amount of these surfaces an important factor in making the City's land management practices more sustainable.

Impervious surfaces are environmentally concerning because with their construction, a chain of events is initiated that modifies urban air and water resources:

- The pavement materials seal the [soil](#) surface, eliminating rainwater [infiltration](#) and natural [groundwater](#) recharge.
- Impervious surfaces collect [solar heat](#) in their dense mass. When the heat is released, it raises air temperatures, producing [urban "heat islands"](#), and increasing energy consumption in buildings. The warm runoff from impervious surfaces reduces dissolved [oxygen](#) in stream water, making life difficult in [aquatic ecosystems](#).
- Impervious pavements deprive tree roots of aeration, eliminating the "urban forest" and the canopy shade that would otherwise moderate urban climate. Because impervious surfaces displace living vegetation, they reduce [ecological productivity](#), and interrupt [atmospheric carbon cycling](#).

Strategies and Benefits from Reducing Impervious Surfaces:

- New developments can be "clustered" to reduce the area of impervious surfaces required. By doing so, it is often possible to create or preserve publicly-accessible green space, which may include a natural stream corridor or wetland.
- Existing wetlands can be preserved for their ecological importance and their ability to filter and store water. Constructed wetlands, can be built to mimic natural wetlands, and used to treat the runoff from impervious surfaces.
- Multi-story parking structures or underground parking can be built instead of sprawling one-level parking lots to reduce the area of land required for parking.
- Swales are beginning to replace the traditional concrete curbs and gutters for managing stormwater. [Swales](#) are gradually sloping depressions or trenches, often lined with gravel and/or planted with vegetation, that allow rainwater to infiltrate the ground.
- Narrower streets and green "islands" can reduce the paved surface area of streets and increase infiltration of rainwater. They also calm traffic and beautify the neighborhood.
- [Green roofs](#) can transform an impervious surface into a beautiful amenity. By allowing rainwater to be partially taken up by plants, they reduce the amount of water that runs off the property.
- Alternative materials can be used in [parking lots](#), driveways, sidewalks and roads to increase infiltration of rainwater.
- Reduce runoff coefficient, which is the fraction of precipitation that runs off into streams and lakes. This is important for flood control channel construction and for possible flood zone hazard delineation. A high runoff coefficient (C) value may indicate

flash flooding areas during storms as water moves fast overland on its way to a river channel or a valley floor.

- When community developments and redevelopments are planned on a "watershed scale," many of these technologies can be combined and huge cost savings in flood damage, water supply and pollution control can be realized.

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can have influence by implementing certain incentives and restrictions in relation to impervious surfaces. The City can encourage urban structures to be built differently to make them function more like naturally pervious soils. Such alternative structures are [porous pavements](#), [green roofs](#) and [infiltration basins](#).

What organizations can the City of Cincinnati partner with on this recommendation?

MSD, Stormwater District, Millcreek Watershed Council, Groundwork Cincinnati/Mill Creek

Is it feasible?

Potential obstacles to this recommendation include:

- Cost and time to convert from impervious to pervious
- Some areas may not want pervious surfaces
- Existing pervious surfaces may not be able to be converted due to location and use

How much would it cost?

- Conversion costs
- Maintenance costs
- Money involved with incentives

Are there possible unintended impacts?

- Maintenance
- Groundwater
- Mosquitoes

Timeline for Implementation

Short, Medium, and Long-Term (One to Six Years): Incentives and restrictions regarding impervious surfaces can be developed and implemented by the City of Cincinnati.

Green Cincinnati Plan – Land Use Recommendation

Mixed Use Centers

What is it and why is it important to the City of Cincinnati?

A mixed use center blends a combination of residential, commercial, cultural, institutional, or industrial uses, where those functions are physically and functionally integrated, and that provides pedestrian connections. Mixed use centers provide diversity, accessibility, and vitality to the community. Some other advantages of having a mixed use center in the community include:

- Greater housing variety and density, more affordable housing (smaller units), life-cycle housing (starter homes to larger homes to senior housing)
- Reduced distances between housing, workplaces, retail businesses, and other amenities and destinations
- Better access to fresh, healthy foods (as food retail and farmers markets can be accessed on foot/bike or by transit)
- More compact development, land-use synergy (e.g. residents provide customers for retail which provide amenities for residents)
- Stronger neighborhood character, sense of place
- Walkable, bikeable neighborhoods, increased accessibility via transit, both resulting in reduced transportation costs

Cincinnati has made an effort to build the City and its neighborhoods around mixed use centers. A majority of the city's 52 neighborhoods have a mixed use center which tends to be the foundation of each neighborhood. The mixed centers help bring together and highlight the architectural significance, historical aspects, and cultural features of each neighborhood, showcasing the unique character each Cincinnati neighborhood holds. As part of PLAN CINCINNATI'S effort to enhance these mixed use centers, the city classified them as ones to be maintained, ones that are evolving and ones in need of transformation. PLAN CINCINNATI also identified future opportunities for mixed-use development or neighborhood centers. Source: [http://www.plancincinnati.org/draft/lo_res/13-Geographic Principles.pdf](http://www.plancincinnati.org/draft/lo_res/13-Geographic%20Principles.pdf)

Implementation of PLAN CINCINNATI land use recommendations is happening through an effort called PlanBuildLive. PlanBuildLive is helping to update the City's zoning and subdivision regulations. Part of this update will include form-based codes which create codes that better match the unique characteristics of the City's existing mixed use centers.

What buildings/areas will be the targets for this program?

Four Cincinnati Neighborhoods are piloting the transition to form-based codes: College Hill, Madisonville, Walnut Hills, and Westwood.

Who can the City partner with to accomplish this recommendation?

- Architects
- Urban planners
- Local communities looking to revitalize their neighborhoods

- Development companies
- Businesses, restaurants, etc. to lease commercial spaces
- Community Development Corporations
- Community Urban Redevelopment Corporations

Who will lead the implementation of this recommendation?

The community in which the mixed center will be located should take a leading role along with the investors and developers of projects.

How can the City of Cincinnati influence the initiation of this program?

The City of Cincinnati can keep the PlanBuildLive site currently updated with the City’s development regulations. The City can also help identify key areas which could be targeted for the development of a mixed use center and target investors for the project.

Is it feasible?

Yes, most of the mixed use centers already exist. Economic and community investments are the keys to making all mixed use centers in the city fully functioning.

How much would it cost?

Efforts like Cincinnati Neighborhood Business Districts United help mixed use centers, but transformative investments often total in the tens of millions of dollars (See OTR and 3CDC).

Are there other positive impacts?

- Brings neighborhood together and gives more of a sense of community and vitality
- Makes neighborhood more aesthetically pleasing
- Creates business and investment opportunities in the community
- Productive use of space, conserve valuable land resources
- Vertically mixed use facilities can be beneficial because they reduce long-term maintenance costs of individual buildings
- Guides development toward established areas, protecting outlying rural areas, and environmentally sensitive resources

Are there possible unintended impacts?

- Overstretching the market
- Moving investment from stable centers to build up unstable ones

Timeline for Implementation

Short-Term (One to Two Years): Keep the PlanBuildLive site currently updated with the City’s development regulations and help identify key areas which could be targeted.

Short-Term, Mid-Term and Long-Term (One to Six Years): Work with Planning and Buildings, architects, local planners, local communities, development companies, local businesses, and restaurants to continue to bring mixed centers to identified areas.

Green Cincinnati Plan – Land Use Recommendation Infill Vacancy and Brownfields

What is it and why is it important to the City of Cincinnati?

The peak population for Cincinnati was recorded in 1950, and since then the City has steadily lost population. A total of 205,000 residents, or 43 percent of the peak population of 503,998 as recorded by the [U.S. Census Bureau](#), has been lost. Cincinnati would benefit from new residents and becoming a denser City, especially in its under-populated neighborhoods. Not only could this help revitalize the neighborhood, but also reduce the carbon footprint per capita. Each resident of the 100 largest metropolitan areas is responsible for 2.47 tons of carbon dioxide in energy consumption on average, compared to the US average of 2.87 tons. Research shows lower carbon emissions in higher density areas to be associated with housing type (attached buildings vs. detached structures) and higher use of public transportation and lower dependence upon private transportation. Increasing population density through infilling vacant buildings and brownfields in the Cincinnati region can be used as a strategy to help lower the carbon footprint per capita in the City.

Sources: <http://www.urbancincy.com/2012/07/whats-the-full-story-behind-cincinnati-50-year-population-decline/>
<http://environmentalresearchweb.org/cws/article/news/34562>

Cincinnati has a larger number of vacant or nearly vacant buildings and brownfields being underutilized and taking up space which could be used to further develop the city. This recommendation focuses on the need to take advantage of the opportunity for growth and development these building and brownfields offer to Cincinnati.

Investing in these vacant buildings and brownfields offers advantages over land in the suburbs including:

- Moving more population into the City
- Office space available to increase commerce in the City
- Better use of the existing infrastructure (sewage, roads, etc.)

Vacant Buildings

- Funding opportunities

There are many funding opportunities to help in the redevelopment of abandoned buildings. The U.S. Department of Housing and Urban Development offers Neighborhood Stabilization Program (NSP) Grants which was established for the purpose of stabilizing communities that have suffered from foreclosures and abandonment.

Source: http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/neighborhoodspg

The U.S. Department of Commerce Economic Development Administration (EDA) offers funding through the Strong Cities, Strong Communities Visioning Challenge (SC2). SC2 funding will support the development and implementation of comprehensive economic

development strategic plans. Grant recipients run a local Challenge Competition, inviting multidisciplinary teams to submit proposals for comprehensive economic development strategic plans establishing and promoting a vision and approach to stimulate local economic development.

Source: <http://reconnectingamerica.org/resource-center/federal-grant-opportunities/>

Brownfields

- Funding opportunities

There have been efforts to reuse brownfields in the region through the obtainment of a US Environmental Protection Agency (USEPA) Brownfield Assessment Coalition Grant. In coalition with the City of Cincinnati and Hamilton County, the Port of Greater Cincinnati Development Authority (Port Authority) has been awarded a \$1,000,000 Hazardous Substance and Petroleum Assessment Grant by the USEPA to conduct environmental site assessments on brownfield property in the City of Cincinnati. It is important the Port Authority uses these funds to its best advantage to clean and redevelop these brown fields and to research the opportunity to obtain more grants similar to this in the future. The EPA also provides funding through the Brownfield Economic Development Initiative (BEDI) and the Brownfields and Lands Revitalization.

Source: <http://reconnectingamerica.org/resource-center/federal-grant-opportunities/>

There is also money available through the City of Cincinnati for investors. The USEPA Brownfield Cleanup Grant comes from federal EPA funds and is available to use for the assessment and cleanup of contaminated properties.

Source: http://choosecincy.com/services/brownfield_redevelopment

What buildings/areas will be the targets for this program?

- The following large buildings are vacant or nearly vacant in the business district:

[Bartlett Building](#), Tower Place Mall, and [Terrace Plaza Hotel](#)

- Over-the-Rhine (OTR)
- Finding vacant buildings to invest within Cincinnati

The City of Cincinnati lists the inventory of current vacant, condemned, and at-risk historical buildings on through the City of Cincinnati Community Development website:

Source: <http://www.cincinnati-oh.gov/community-development/property-maintenance/vacant-hazardous-buildings/>

- Finding brownfields to invest within the Cincinnati region

Inventory of currently available brownfields can be found through the EPA website:

<http://www.epa.state.oh.us/portals/30/SABR/docs/BrownfieldInventoryGuide.pdf>

Who can the City partner with to accomplish this recommendation?

- The Port of Greater Cincinnati Development Authority – offering assistance through its United States Environmental Protection Agency (USEPA) Brownfield Assessment Coalition Grant (<http://www.cincinnatiport.org/>)
 - The Port Authority was awarded \$10,721,403 in Clean Ohio Funds \$7,382,130 in Clean Ohio Revitalization Funds (CORF) and \$3,339,273 in Clean Ohio

Assistance Funds (COAF) to pay for the environmental assessment, cleanup, and demolition activities

- Hamilton County Land Bank - The Hamilton County Land Reutilization Corporation (HCLRC) helps facilitate the effective reutilization of nonproductive lands(<http://www.cincinnatiport.org/hclrc/>)
- Hamilton County Development Company - The Urban Land Assistance Program
- Cincinnati Center City Development Corporation (3CDC)
- Other Community Development Corporations (CDCs)
- Development and architectural firms in Cincinnati
- Cincinnati Preservation Association
- Entrepreneurs looking for a location to start their business

Who will lead the implementation of this recommendation?

The City's Strategic Program for Urban Redevelopment (SPUR) team will have a key role in the redevelopment of brownfields. For general infill, the City will partner with Port Authority, HCLRC, HCDC, 3CDC, developers, architects, Cincinnati Preservation Association, entrepreneurs.

How can the City of Cincinnati influence the initiation of this program?

The City of Cincinnati will have a key role in the initiation and successfulness of this recommendation. It is important for the vacant buildings and brownfields available for redevelopment to be properly identified and marketed to the community so potential investors will be aware of the opportunity to invest in these properties. The City can also work to try to gain federal funding for the revitalization of these buildings and brownfields to make the financial investment more manageable. Tax or other incentives can also be offered to those who invest in these properties.

Is it feasible?

Some obstacles to achieving this recommendation:

- Brownfields may be contaminated by low levels of pollution or hazardous waste
- Investigation and cleanup of brownfield sites is largely regulated by state environmental agencies in cooperation with the EPA

How much would it cost?

- A cost-benefit analysis should be completed before investing in the brownfield because the cost of cleaning it to safe standards may be more than the land would be worth after redevelopment
- Cleaning brownfields (examples of methods: [soil vapor extraction](#), [bioremediation](#) and [in situ oxidation](#))
- Rehab of vacant buildings

Are there other positive impacts?

- Creation of new jobs in redevelopment process
- Improve neighborhoods

Are there possible unintended impacts?

- Gentrification
- Decreasing housing affordability
- Increased traffic

Timeline for Implementation

Short-Term, Mid-Term and Long-Term (One to Six Years): The City can acquire federal funding for revitalization of buildings and brownfields, properly identify and market these to the public. The City can partner with Department of Planning, architects, local planners, local communities, development companies, local businesses, and restaurants to continue to bring development to identified areas. The city will continue to support redevelopment efforts by organizations like MSD and 3CDC who through their investments are recreating neighborhoods like South Fairmont and Over-the-Rhine .

Overall Sources: <http://en.wikipedia.org/wiki/Brownfields>

Green Cincinnati Plan – Land Use Recommendation

Triple Bottom Line for City Funded Projects

What is it and why is it important to the City of Cincinnati?

The City plays a role in many of the development projects within the city limits. Due to the complexities that arise with urban infill development, the City often uses public dollars to help with aspects of projects that have a public purpose. The city also often contributes land it owns to projects. Be it tax increment financing (TIF) dollars for plazas and parking decks, in-kind donations of land, infrastructure improvements, or brownfield cleanups, the city uses its resources to help stimulate new development.

New tools are available to evaluate impacts of development on the City. These tools go beyond the fiscal analysis that is often currently included in today's agreements to environmental and quality of life impacts. Sophisticated models can now quantify how new development projects affect air and water quality, energy consumption and greenhouse gas production, and even biodiversity and combined sewer overflows.

Citirama

Citirama is an initiative supported by the City of Cincinnati's Community Development Department and the Homebuilders Association of Greater Cincinnati to build new market rate homes inside the City. Often the City contributes land, infrastructure, and/or marketing dollars to help make these developments successful. For example, in the 2012 Citirama at Virginia Place in Northside, city property was sold at a price lower than the market value.

A recent City of Cincinnati council motion indicated the Council's desire to see the future Citirama projects incorporate improvements such as greater pedestrian connections to neighborhood business districts that help make more walkable, sustainable developments. One way to enhance the walkability and sustainability of Citirama developments is to include these measures in Citirama developer agreements.

Tax Increment Financing (TIF)

Vernon Manor, Queen City Square, and USquare @ the Loop are just a few recent projects that the city has assisted through the use of tax increment financing (TIF) of public infrastructure – in these three cases – parking garages. TIF uses future property tax increases to make bond payments on these capital investments. The city often includes additional requirements in these development agreements such as construction workforce, prevailing wage, and union participation. TIF contribution to these projects is often significant: the parking garage at Vernon Manor cost \$7.1 million to build with costs including land acquisition and other non-construction items bringing the total to over \$10.3 million. USquare @ the Loop included over \$18.4 million in public improvements funded by the City. These development agreements are put together by the City's Economic Development office and often include fiscal analyses and an additional requirements section that provides opportunity to include more elements related to sustainability.

What buildings/areas will be the targets for this program?

Buildings and projects that are supported by City funding or in-kind donations.

Given the capital nature of development projects – many of these projects are financed in a 35 year time frame – new development projects will have a lasting impact on the City. This recommendation will help ensure the projects maximize their benefits to the City.

Who can the City partner with to accomplish this recommendation?

- Architects
- Urban planners
- Local communities looking to revitalize their neighborhoods
- Development companies

Who will lead the implementation of this recommendation?

City Council approves development agreements and sales of City property. They could pass a policy that directs the administration to include broader analyses of how city funded projects can contribute to the City's sustainability.

How can the City of Cincinnati influence the initiation of this program?

The City of Cincinnati can use the framework of PLAN CINCINNATI and the Green Cincinnati Plan to guide the selection of the measures that should be included in City development agreements and property sales. MSD is evaluating sophisticated software programs that can help quantify the economic impact of projects on City priorities like reducing combined sewer overflows, improving air quality, and reducing greenhouse gas emissions. Quantifying these impacts can help make a stronger case for incorporating sustainability features into future projects.

Is it feasible?

Yes, political issues seem to be the primary obstacle to achieving this recommendation.

How much would it cost?

The costs include staff time of putting together a policy and implementing the policy by using the modeling software.

Are there other positive impacts?

The intent of this recommendation is to minimize the costs to taxpayers and ratepayers that often are passed on from developers. Potentially this policy can help:

- reduce sewer rates
- lower health care costs
- reduce energy expenditures.

Are there possible unintended impacts?

The private sector may be reluctant to enter into agreements with the City if these agreements have too many “strings attached.”

Timeline for Implementation

Short-Term, (One to Two Years): - City Council will pass a policy that directs the administration to include broader analyses of how city funded projects can contribute to the City's sustainability. The city will use sophisticated models like Sustainability LENS to evaluate the financial, environmental and social sustainability of City funded developments. The City can partner with architects, urban planners, local communities, and development companies on terms and conditions of city-funded project agreements.

Mid-Term and Long-Term (Three to Six Years): The City can partner with architects, urban planners, local communities, and development companies on terms and conditions of city-funded project agreements.

Green Cincinnati Plan –Food Recommendation Increase City Capacity for Urban Food Production

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on specific strategies for increasing Cincinnati’s capacity for urban food production such as:

- Zoning
- Incentives for food producing land
- Providing garden space for community residents
- Long-term leases that support community gardens, urban farms and indoor agriculture

There is an opportunity for creative design thinking around how food production can be incorporated into the current built environment. Product designers and architects are finding ways to fit food production into buildings; landscape architects and planners are reimagining entire communities built around food production and crafting innovative systems to distribute food to low income residents, share growing spaces and gardening equipment, and weave backyards into farm-scale landscapes.

Source: <http://sustainablecitiescollective.com/growninthecity/22664/5-questions-dr-nevin-cohen-five-borough-farm-project-food-systems-academia-and->

Examples of Programs to Increase Land Devoted to Urban Agriculture

Mow to Own Program – City of Columbus

The Mow to Own program in Columbus is an example of how vacant land can be utilized by Cincinnati residents. This type of program is an opportunity for these vacant plots to be used for community gardens or urban farms, depending on the size. The City of Columbus’ Mow to Own program is implemented through the City of Columbus Land Bank. Through the program, adjacent homeowners may purchase an adjacent vacant lot to expand the homeowner’s existing property by earning all or part of the purchase price with maintenance and/or improvements to the vacant lot. Ownership of vacant lots may also be earned by a nonprofit organization with 501(c)(3) status if the organization is an existing stakeholder within the same neighborhood as the city owned property to be acquired. In this case; however, priority is given to the adjacent property owners if the situation arises.

An application is required to participate in the Columbus program. Once the application is approved, the City of Columbus and the buyer enter into an agreement that specifies the purchase price, proposed improvements, and maintenance plan. The property is transferred to the buyer once enough credits are earned toward the purchase price, either by completing and paying for the agreed upon improvements or through cash payment. Additionally, the deeds for the vacant lots acquired through the Mow to Own program will contain deed restrictions, including, but not limited, to a restriction that the acquired vacant lot may not be resold without written approval from the City of Columbus Land Redevelopment Office for a period of five years from the closing date.

Source: http://development.columbus.gov/uploadedFiles/Development/Land_Redevelopment/Document_Library/Application%20for%20lot%20sale%20and%20mow%20to%20own.pdf

Hamilton County Land Bank Program

The Hamilton County Land Reutilization Corporation (HCLRC) was incorporated by the County Treasurer in October 2011 to serve as the Land Bank for Hamilton County. In February 2012, the Port of Greater Cincinnati Development Authority was contracted to serve as the management

company for the HCLRC. A land bank promotes and facilitates the reclamation, rehabilitation, and reutilization of vacant, abandoned, tax-foreclosed, or other real property to assist governmental entities and other nonprofit or for-profit persons to assemble, clear, and clear the title of vacant, abandoned, or tax-foreclosed real property. This property can then be put to productive uses. On opportunity for productive use of this land is to use it for urban agriculture.

Examples of Zoning to Promote Urban Agriculture

Hamilton County Development Regulations

Through the Hamilton County Climate Initiative, Hamilton County created a reported called the Development Regulations Analysis for Energy Efficiency and Sustainability. In the Urban Agriculture chapter of this document, the diagnostic report and recommendations section included two recommendations that can be applied to help increase Cincinnati's capacity for food production:

- Draw a difference between rural and suburban agriculture
- Create regulations that are specific to the keeping of backyard chickens for personal use in all residential districts, with appropriate limits on size of enclosures and structures, number of hens, and setbacks.

Source: <http://www.hamiltoncountyohio.gov/hcrpc/pdf/Hamilton%20County%20Diagnosis%20-%20FINAL%20Jan%2030%202012.pdf>

Chicago's Urban Agriculture Zoning Proposal

Chicago used an agriculture zoning proposal to encourage neighborhood developments, including gardens and greenhouses. Under Chicago's proposed amendments, community gardens would be defined as neighborhood-based developments that provide space for members of the community to grow plants for beautification, education, recreation, community distribution or personal use. The community gardens have to be sites that are owned and managed by public or civic entities, nonprofit organizations, or other community-based organizations that are responsible for maintenance and operations. Under this proposal community gardens would be allowed in virtually every part of the Chicago with the exception of manufacturing districts.

Community gardens in Chicago's residential districts may not be larger than 18,750 square feet. Larger community gardens may exist in parks and open space districts. Sheds and greenhouses may not take up more than 10 percent of the community garden site, or 100 square feet, whichever is greater. Composting is limited to the materials generated on-site, not organic matter brought to the garden by local residents. The processing, storage and sale of plants or plant products are prohibited on site.

In contrast to community gardens, the Chicago ordinance defines commercial gardens and greenhouses as growing locations used for the propagation, processing, storage and sale of plants and plant products. These commercial gardens can include growing beds, hoop houses, greenhouses, vertical farms, and hydroponic systems.

Outdoor locations for commercial gardens and greenhouses in Chicago would be allowed in commercial and certain business districts, as well as planned manufacturing districts. Indoor facilities would be allowed in every planned manufacturing district. Commercial gardens are restricted to composting only the organic matter generated on-site.

Source: <http://www.urbanfoodpolicy.com/2011/01/chicagos-urban-agriculture-zoning.html>

Examples of Providing Security of Land for Urban Agriculture

Long Term Leases

Currently, the City of Cincinnati leases city property for urban agriculture purposes. These leases are handled through the Civic Garden Center and are often up to five years in length. Given the amount of time and effort needed to develop productive soils and establish agricultural infrastructure, longer term leases would give farmers more certainty. Land that is undevelopable (floodplains) could be leased at longer terms with revocable terms if the land falls out of productive use.

Conservation Easement

A Conservation Easement (CE) provides a time-honored and legal way for landowners to ensure preservation and security of their lands. CEs assure landowners that their wishes for preservation of their property will be honored forever. These land easements can ensure certain areas of land remain forever free from future development or the land can be designated for limited uses that preserve the character of the land. If a landowner grants a conservation easement, the landowner continues to privately own and manage the land and may receive significant state and federal [tax](#) advantages for having donated and/or sold the conservation easement.

Source: http://en.wikipedia.org/wiki/Conservation_easement

Examples of Helping to Increase Urban Agriculture Productivity

Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) National Seasonal High Tunnel Initiative (NSHTI)

Through the NSHTI, NRCS can assist agricultural producers in extending the growing season for high value crops through a polyethylene covered structure called a seasonal high tunnel. This structure acts much like a greenhouse to help extend the growing season. Financial assistance is available through this program. Interested parties can contact the Hamilton County Soil and Water Conservation District.

Aquaponics

Gabriel's Place, an urban food resource in Avondale, has a small aquaponics system that pairs raising fish and growing food. Aquaponics is a sustainable food production system that combines a traditional aquaculture (raising aquatic animals such as snails, fish, crayfish or prawns in tanks) with hydroponics (cultivating plants in water) in a symbiotic environment. This intensive system can help increase food production in places where land is at a premium.

Promote Existing Resources

Civic Garden Center

The Civic Garden Center has programs for the promotion and education of community gardening and horticulture practices in an urban setting.

University of Cincinnati

The University of Cincinnati offers a Certificate in Urban Agriculture through the Horticulture degree in the College of Design, Architecture, Art, and Planning (DAAP). The Certificate in Urban Agriculture examines contemporary issues in horticulture, urban design, livability and quality of life, food security, and sustainability.

Who will be the targets for this program?

There are different purposes for why people value urban farms including income generation potential, community development opportunities, local food system development, and alternative means of food access. These purposes can co-exist; however, because they could also come into conflict, there is a need to target and engage diverse communities to create a vision for the form and scale of urban agriculture in Cincinnati.

Source: <http://www.mottgroup.msu.edu/uploads/files/59/Growing%20Food%20in%20the%20City%20-%20Colasanti%20Litjens%20Hamm.pdf>

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati will be the main driver behind this recommendation because it has the authority to influence the implementation of the different strategies.

Is it feasible?

This recommendation is feasible. There are several structures currently in place to facilitate including the City of Cincinnati Urban Agriculture Program, Cincinnati Urban Agricultural Advisory Board, Hamilton County Land Bank and Hamilton County Department of Planning.

Although this plan is feasible, some potential obstacles to implementing this plan include:

1. Soil contamination with lead and other heavy metals
2. Not all community members understands the benefits of urban farms or want to participate in the program
3. Use of potable water for irrigation

Below are suggested methods to deal with obstacles one and three:

- Municipal composting of organic matter to create clean soil for gardens
- Support for rainwater harvesting infrastructure in urban farms and gardens

Source: <http://sustainablecitiescollective.com/growninthecity/22664/5-questions-dr-nevin-cohen-five-borough-farm-project-food-systems-academia-and->

How much would it cost?

- Opportunity cost of other opportunities to develop land used for agriculture
- Promotion of programs, incentives, etc.

Are there other positive impacts?

- Saves money
- Increases nutrition
- Contributes to local economies by creating jobs and producing valuable products
- Builds community capacity
- Health benefits

<http://www.ers.usda.gov/publications/err-economic-research-report/err97.aspx>

Are there possible unintended impacts?

In certain parts of the city development pressure may impact urban agriculture lots.

Timeline for Implementation

Short-term: Several pieces of the implementation are already underway. The Hamilton County Land Bank will be taking ownership of parcels that could be used for urban agriculture. Cincinnati's Plan Build Live initiative is updating the zoning and subdivision regulations for the city and urban agriculture was funded in the 2013 City budget. The City has an Urban Agriculture program through

which many initiatives could be facilitated. Many initiatives could also be in conjunction with Cincinnati's Urban Agricultural Advisory Board.

Green Cincinnati Plan –Food Recommendation Promote Urban Farming Best Practices

What is it and why is it important to the City of Cincinnati?

One of the goals of the Food Chapter is to increase the number of food growers in the Cincinnati region. People interested in agriculture as a livelihood need proper training in farming techniques, as well as, basic business skills in order to handle every day business transactions and marketing of farm products. This recommendation promotes current agricultural education programs and identifies strategies for additional agriculture educational opportunities that can be provided to the public.

Training for how to accurately follow sustainable urban farming practices should be promoted by the City of Cincinnati to ensure food production is done correctly in the most environmentally friendly way possible. Internship and apprenticeship programs are effective strategies to provide training to people interested in being a farmer. The programs listed below will provide people with the resources needed to explore or gain knowledge and skills needed to pursue a career in farming or agriculture. These resources are also useful to current farmers because they provide information on issues such as efficiency, profitability and farming techniques.

Source: <http://sustainableaged.org/Resources/JobListings/tabid/104/Default.aspx>

Examples of Potential Resources for this Recommendation

Cincinnati State

Under the auspices of its horticulture department, Cincinnati State has many programs that can be of assistance to farmers and others involved in urban agriculture. For example, a specialty crop production certificate program is scheduled to be launched in Fall Semester of 2013.

Food Hub Cooperative

One mission of The Cincinnati Union Cooperative Initiative (CUCI) is to train and increase the number of local farmers using the Ohio Cooperative Development Center's already developed CSA Growers/Manager Regional Training Program.

Source: <http://www.cincinnatiunioncoop.org/coop-initiatives/>

OSU Extension Program

The OSU Extension Program works with current farmers to strengthen their businesses, adopt new technology and improve efficiency while protecting the environment.

Source: <http://extension.osu.edu/topics/agriculture>

Ohio Produce Growers & Marketers Association (OPGMA)

OPGMA is an organization of produce growers and marketers whose goal is to produce exceptional quality crops, for consumers and processors, by utilizing environmentally friendly practices.

OPGMA provides educational opportunities to businesses, families, and employees associated with the production and marketing of Ohio's fresh produce.

Source: <http://www.opgma.org/>

The Ohio Ecological Food and Farm Association (OEFFA)

OEFFA is a membership-based, grassroots organization, dedicated to promoting and supporting sustainable, ecological and healthful food systems.

Source: <http://www.oeffa.org/index.php>

UK Extension Program

The University of Kentucky's College of Agriculture is home to the Kentucky Cooperative Extension Service. It is the most comprehensive outreach and engagement program at UK. The program is designed to help farmers through education in farming practices.

Source: <http://ces.ca.uky.edu/ces/>

Other National Resources for Farmer Training

Below links are resources of current farming and agricultural educational work programs. These can be used to help form farmer internship or apprenticeship programs in the Cincinnati area:

- ATTRA - <http://attrainternships.ncat.org>
- California Certified Organic Farmers Employment and Internship or Apprenticeship Classifieds - <http://www.ccof.org/classifieds.php>
- Center for Environmental Farming Systems Internship Program - <http://www.cefs.ncsu.edu/getinvolved/internships/internships2012.html>
- Apprenticeship Program - www.cefs.ncsu.edu/getinvolved/apprenticeships.html
- Grow Food - <http://growfood.org>
- Tilth Producer's Apprenticeship Placement Service - <http://www.tilthproducers.org/placement.asp>
- Good Agricultural Practices (GAP)
- Collaborative Regional Alliance for Farmer Training (CRAFT)

Source: <http://www.craftfarmers.org/>

Who will be the targets for this recommendation?

- Local farmers
- Educational entities in Cincinnati and around the region
- People interested in becoming a farmer or learning more about agricultural processes

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can support Cincinnati Public Schools (CPS) to reach out and encourage students at a young age to explore agricultural education. The City can encourage CPS to include agricultural education in its curriculum at all education levels through grants (Ohio Department of Education) and incentives to develop school community gardens which provide hands on learning opportunities for students. One suggestion for adding agricultural education to the curriculum is to link the agriculture programs to science and math.

The City of Cincinnati can form partnerships with local high schools to create programs for students interested in learning about farming. These programs will help reach students at an age when they will be able to take these skills after graduation and put them to use with a farming career.

The City can promote the resources listed in this section.

Is it feasible?

A potential obstacle to achieving this recommendation is that urban agriculture on a large scale isn't for everybody – it's hard work for modest pay.

How much would it cost?

- Promotion needed to build awareness
- Creation of new programs in schools: teachers, teaching tools, facilities to practice, etc.

Are there other positive impacts?

- Economic
- Water Quality
- Market for compost

Are there possible unintended impacts? No.

Timeline for Implementation

Short-term: Many training programs already exist and more formal ones like the Cincinnati State program could start to implement this recommendation in 2013. Partner with CPS, local high schools and farmers.

Green Cincinnati Plan –Food Recommendation Create Accessible Database of City’s Food Production Capacity

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on creating an accessible database of the City’s food production capacity to include information such as location, square footage, etc. To achieve the creation of this database, the City will need to conduct a land inventory of Cincinnati. This land inventory will help determine properties suitable for future food production or identify properties already producing food such as urban farms, community gardens and municipal edible landscape.

Strategies to Creating Database

Detroit Case Study

There are several important points from the Detroit case study that should be taken into consideration before implementing a database in Cincinnati. In order to determine the production potential of vacant land in Cincinnati relative to residents’ present and recommended consumption levels, secondary data needs to be drawn together to estimate:

- Fruit and vegetable consumption
- Seasonal availability by crop
- Quantity and acreage of Detroit’s publicly owned vacant parcels
- Acreage required to maximize local food supply based on fruit and vegetable yields

This methodology results in a range of acreages that could conceivably be cultivated to supply a given portion of the local diet and places these in the context of the available land within a municipality.

Source: http://www.agdevjournal.com/attachments/137_IAFSCD_Assessing_Food_Supply_Capacity_Detroit_Nov-2010.pdf

Use of Photonics

Another option for transferring information into the database includes the use of photonics. This method utilizes satellite remote sensing to detect large-scale crop effects, scanning technology and infrared imaging to monitor food production and quality, and sensor systems for planting and irrigation. A similar strategy was used by the City for the tree canopy initiative. Source:

<http://www.op-tec.org/enabling.php>

Current Statistics Available for Possible Use to Measure Food Production

When determining what information should be included in the database, the City of Cincinnati can use FAOSTAT as a guideline. FAOSTAT is an online database that provides statistics on crops, livestock, irrigation, land use, fertilizer, pesticide consumption, and agricultural machinery. Source:

<http://faostat.fao.org/site/339/default.aspx>

Scanner Technology

The database must also track the foods produced by our local farmers. A strategy for ensuring food production and sale are accounted for is the use of scanner technology. Farmers producing products can use QR codes on their products and then scan the code, which will be sent to the database. This ensures the item can be tracked and accounted for from the production stage through the selling stage.

Who will be the targets for this recommendation?

The database will help City of Cincinnati Council and Administration make informed decisions about urban agriculture policy and funding.

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati needs to work with other partners to complete this database. Potentially this is a project for a Seasongood Intern.

Who are potential partners for this recommendation?

The City of Cincinnati can partner with Green Umbrella and the Food Hub to help collect data and use Green Umbrella's website to house the database. The Green Umbrella *Local Food Action Plan Project* includes a regional food system assessment that could help inform the work on this database. The Cincinnati Union Cooperative Initiative (CUCI)'s Cincinnati Food Hub Feasibility Study completed in 2012 is another resource that could help with this database.

Is it feasible?

What are some obstacles to achieving this recommendation:

- The database will never officially be accurate because it is impossible to have real time information of food production and sales
- Reluctance from farmers to report numbers to the database
- How to quantify food production – acres, calories, etc.

How much would it cost?

- Creation and implementation costs – potentially a job for a summer intern

Are there other positive impacts?

- The creation of a uniform system for tracking food production and sales in the region

Are there possible unintended impacts?

If the database reveals the potential for urban agriculture in the city is limited, this could impact the funding of future programs.

Timeline for Implementation

Short-term: Collect data and determine metrics to be included in database. Determine how the database will be updated so accurate records can be acquired when updating is needed.

Mid-term: Design database and compile data collected into database. Market the use of this database to those it would help.

Green Cincinnati Plan –Food Recommendation Support Incorporation of Urban Agriculture Features into Developer Plans

What is it and why is it important to the City of Cincinnati?

This recommendation seeks to increase the incorporation of urban agriculture features such as rooftop gardens, raised garden beds, edible forestry and community gardens into development plans.

Strategies for this Recommendation

Policy Guidelines from Northwestern

According to a study done by Northwestern, the following are strategies for how planners could help implement this plan:

- Prepare comprehensive and neighborhood plans that recognize community gardens and other forms of urban agriculture, farm/garden stands, and farmers' markets as desirable civic uses in neighborhoods, and provide sufficient space, infrastructure, and inter-modal transportation access for such uses. Ensure that zoning barriers to these activities are addressed or removed.
- Encourage mixed-use neighborhood design and redevelopment to include small and mid-size grocery stores (e.g., 3,000 to 20,000 square feet), seasonal farmers markets, community-based and government nutrition programs, and open space and related infrastructure for community vegetable gardens to allow residents to grow their own food.
- Develop area plans and design schemes in ways that encourage safe and convenient pedestrian, bike, transit connections between neighborhoods and the food sources described above.
- Support transit programs that improve connections between low-mobility neighborhoods on the one hand, and supermarkets, community gardens, food assistance programs such as food pantries and soup kitchens, and health and social service providers on the other, with a view to reducing travel time and enhancing safe and convenient use.
- On publicly owned lands, such as schoolyards, parks and greenways, and tax-foreclosed properties, support the development of vegetable gardens, edible landscaping, and related infrastructure, and the formation of partnerships with community-based nonprofits serving low-income residents for garden related programs.

Source: <http://www.planning.org/policy/guides/adopted/food.htm>

Hamilton County Report

Through the Hamilton County Climate Initiative, Hamilton County completed a report called the Development Regulations Analysis for Energy Efficiency and Sustainability. This report includes a Diagnostic Report and Recommendations. One chapter of this analysis is focuses on Urban Agriculture. Several recommendations below involved making food production possible in new developments:

- Allow suburban agriculture uses in planned districts, to accommodate smaller-scale agriculture uses in planned unit development (PUD) areas.
- Allow community gardens to qualify as a percentage of required open space. Consider extra credit for providing irrigation, tool sheds, and other supportive elements.
- Add definition for community gardens (for private and public lands) and then allow community gardens as a primary use in residential districts and as an accessory use in all or most districts. Allow these on open space lots in subdivisions as primary use.
- Require or encourage food-bearing trees to be included as part of landscape plans with irrigation provided by non-potable, on-site water resources (active and/or passively harvested rainwater and stormwater, greywater, condensate, etc.).

- Add definition for rooftop gardens to include food production, and include as a permitted accessory use in all districts.

Who will be the targets for this recommendation?

- Urban developers
- Current homeowners who can make improvements to their land/homes

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can play a vital role in accomplishing this recommendation through zoning policies and subdivision codes. The City needs to work in a partnership with planners to ensure the strategies identified in this recommendation are a priority in future urban planning and to encourage identification of any areas of improvement in the current plan. There is also an opportunity for the City to provide incentives for having rooftop gardens, etc. as part of this recommendation.

Is it feasible?

Some obstacles to achieving this recommendation include:

- Perception of excessive regulation
- People willing to take care of these food system features if they are put into development plans
- In some areas pests such as deer can make urban agriculture challenging

How much would it cost?

The costs to the City are limited to staff time needed to update and enforce regulations. There are opportunities with the ongoing PlanBuildLive project to incorporate these changes into the rewrites of the zoning and subdivision regulations. Developers may also incur additional costs to include urban agriculture features but they may find that these amenities can help market and increase the value of their developments.

Are there other positive impacts?

- Improved Market Access Opportunities
- Improved Health
- Environmental Sustainability

Are there possible unintended impacts?

The potential for maintenance of uncared for urban agriculture features

Timeline for Implementation

Short-term: Implement changes in the city's subdivision and zoning codes

Green Cincinnati Plan –Food Recommendation Increase Access to Local Foods in all Neighborhoods

What is it and why is it important to the City of Cincinnati?

This recommendation includes strategies for increasing the access to local foods in all neighborhoods through outlets such as:

- Traditional grocery stores
- Farmers markets
- Corner stores
- Mobile markets

Limited access to fresh fruits and vegetables is a well-documented problem on both a local and national level. Throughout the Greater Cincinnati region this issue directly and negatively impacts many neighborhoods. The Cincinnati Food Security: A Community Assessment study concluded that of the 52 neighborhoods in Cincinnati, not one is completely food secure and 31 neighborhoods don't have a single grocery store within its boundaries. These places, known as food deserts, are typically more predominant in low- income areas. Below is a map showing Cincinnati neighborhoods classified as food deserts:



Studies show many inner-city residents have little choice but to shop in their neighborhood and end up paying as much as 40 percent more than suburban shoppers for basic food items. Meanwhile, fast-food chains have replaced traditional restaurants in most of these neighborhoods. Health issues such as obesity, cardiovascular disease and the other effects of eating poorly are additional issues contributing to the overall problem.

Source:<http://news.cincinnati.com/article/20111112/COL01/111130305/Lost-Food-Desert>

A food desert is a district with little or no access to foods needed to maintain a healthy diet but often served by plenty of fast food restaurants. The USDA has a tool through its website, <http://www.ers.usda.gov/data-products/food-desert-locator/go-to-the-locator.aspx>, which would allow the City of Cincinnati to identify the food deserts in this region. The University of Cincinnati Design Center identified seven city neighborhoods with serious food access problems because of high poverty rates and distance from a grocery store.

Source:<http://news.cincinnati.com/article/20111112/COL01/111130305/Lost-Food-Desert>

To help mitigate food deserts, this recommendation focuses on providing incentives to ensure all people in the City of Cincinnati have access to fresh local foods within a half-mile or 15 minute walk from their home. These distance parameters allow people to shop more frequently because the stores are a walkable distance, allowing for greater accessibility. Although the food may be accessible, incentives are still needed to encourage people to change their shopping habits and start

buying more foods grown locally. Some possible strategies to increase accessibility and provide incentives include:

- EBT matching
- Companies/institutional based incentives

Strategies for this Recommendation

Farmers Markets

Farmers markets provide a common place where farmers can sell their product to consumers. Large cities tend to open their farmers markets on the weekends and one day in the middle of the week. However, to create consumer dependency on urban agriculture and to introduce local food production as a sustainable career for farmers, markets would have to be open regularly. Cincinnati currently has markets every day of the week in some portions of the city.

Cincinnati has numerous farmers markets spread out through neighborhoods across the city and greater region. Some of the farmers markets in the city include:

College Hill - Findlay Market - Hyde Park - Lettuce Eat Well (Westwood) - Mount Washington - Northside - Saylor Park.

There are many other farmers markets in wealthier neighborhoods outside the city.

Sources: http://en.wikipedia.org/wiki/Urban_agriculture#Economy_of_scale
www.thecincyblog.com/farmersmarket

Market Spotlight: Findlay Market

Findlay Market is one of Cincinnati's most comprehensive food markets and is a primary source of food in Cincinnati's urban core. The market serves as a place where residents can shop, socialize and reconnect with the people who grow and sell the area's local foods. Findlay Market works to support our local farmers, fishmongers, butchers, bakers, etc. and keep local food in our region. The market is home to 35 full-time, year round merchants, 58 local farmers and cottage food producers, selling directly to the public and more than 70 seasonal and part-time vendors. On a typical Saturday, about 300 people are working. In 2011 about 881,400 shopping visits were made by customers of the market and about \$30 million spent on products from the market.

Source: www.findlaymarket.org

Healthy Corner Store Initiative

Through the Healthy Corner Store Initiative, the Center for Closing the Health Gap has been working with three small, independently owned corner stores in Avondale during the initial phase. The initiative equips store owners with the necessary educational training, technical assistance, equipment and resources to transform their stores into a market for the sale of healthy foods in a healthy store environment. Educating community residents and store owners regarding the importance of healthy eating and making healthy food choices is another key component of the initiative.

In addition to encouraging better eating habits and providing a wide range of healthy food options, the initiative offers additional job opportunities as corner stores expand, thereby enhancing the economic vitality of the community.

Source: <http://closingthehealthgap.org/cincinnati-digs-food-deserts-fresh-food-fund/>

Food Delivery Services – Green B.E.A.N. Delivery

Green B.E.A.N Delivery is networked with the best organic produce growers and local artisans to provide home delivery of organic produce and natural groceries to Cincinnati, Northern Kentucky, Dayton and Columbus. The organization works to provide fresh foods free of additives and

preservatives by supporting farmers and artisans who create products sustainably for the health of our community, local economy and the environment. Customers may choose between five different produce bins. These bins vary by size and their contents change each week to reflect seasonal availability of fruits and vegetables. Customers may also add groceries to their delivery such as milk, eggs and bread, which will be composed of products from Midwest Food Artisans. Green B.E.A.N. Delivery also provides a variety of grains, beans, rice, nuts, flour, dried fruits and more which may be bought in bulk to reduce packaging and give the ability to stock up on organic items. Source: www.greenbeandelivery.com/cincinnati

Mobile Produce Vending Program

A pilot program to increase access to fresh produce by issuing permits to community gardeners, urban farmers, and entrepreneurs to sell fresh fruits and vegetables near community gardens and in neighborhoods with food deserts has been created by the City of Cincinnati. Neighborhood locations include Camp Washington, East End, English Woods Evanston, South Fairmount, Over-the-Rhine, West End, and Winton Hills.

Hamilton County Zoning Recommendations

Through the Hamilton County Climate Initiative a report was completed to create the Development Regulations Analysis for Energy Efficiency and Sustainability. This report includes a Diagnostic Report and Recommendations. One chapter of this analysis focuses on Urban Agriculture. In this chapter there are several recommendations regarding ways to encourage local food including:

- Allow farm stands in single family residential districts. Limit the size to accommodate only small-scale roadside sales without any off-street parking, and limit signage to four square feet in area.
- Allow outdoor farmers markets as a primary use in the retail sales and service use category. Farmers markets are also permitted by right or with a development plan in a number of mixed use and commercial districts.
- Modify home occupation language to allow limited food production uses from home as a permitted use.
- Add a definition for community supported agriculture (CSA) operations and include them in the list of permitted uses for agricultural uses (both rural and suburban).

Who will be the targets for this recommendation?

- Residents living in food deserts within the City of Cincinnati
- Any residents living in an area without a walk able food store
- Distributors of foods

How can the City of Cincinnati influence the initiation of this recommendation?

Cities including New York and San Francisco have hired food-policy directors to expand access to fresh produce, promote farmer's markets, bring in more grocers, and encourage corner stores to offer healthier fare.

Source: <http://www.businessweek.com/articles/2012-08-23/fresh-relief-for-baltimores-food-deserts>

The City of Cincinnati can directly affect the success of this recommendation through its support of policies and programs to increase access to local food in all neighborhoods.

Is it feasible?

Obstacles which may be encountered in relation to this recommendation:

- Outlets to sell food may not be currently present

- Changing shopping habits of residents in these areas
- Lack of education for fresh food preparation

How much would it cost?

There should be no costs to the City except in staff time needed to change regulations, coordinate and promote.

Are there other positive impacts?

- Health benefits
- More business for local farmers

Are there possible unintended impacts?

There is potential for too many farmers markets and not enough farmers or demand.

Timeline for Implementation

Short term.

Green Cincinnati Plan –Food Recommendation Access, Develop and Adopt Financial Incentives for Midsize Food Processers and Distributors

What is it and why is it important to the City of Cincinnati?

There are many shades of local foods. Somewhere between the mega produce farms of California and the backyard vegetable garden is a philosophical space where the term “local” is still being defined. Large food distributors such as Produce One and Ellenbee Liggett are making great strides to source more and more of their foods from sources close to home. For example, when looking at the local food providers for Dayton-based Produce One, many are large scale operations located in Ohio, but are still hundreds of miles away from where the food is consumed. Most local food supporters are thinking of smaller, more regional based operations when they say “local food.”

This recommendation sets strategies to access, develop and adopt financial incentives geared towards these small to midsize, regional food producers. The aim of this recommendation is to link the local farmer with the existing distribution network and increase the number of smaller scale processing facilities. It is important to state that the implementation of recommendations concerning promotion of local sustainable farming practices and creating an accessible database for food production will make achieving this recommendation more feasible.

Food Hub

The creation of a food hub will help to bridge the gap between local farmers and the existing network. Many farmers are challenged by the lack of distribution and processing infrastructure of appropriate scale that would give them wider access to retail, institutional, and commercial foodservice markets, where demand for local and regional foods continues to rise. There are three primary reasons why this lack of infrastructure stifles the development of regionally based food systems:

- Limited market and revenue options
- Limited distribution and marketing capacity
- High transaction cost

Farmers markets and public markets are excellent places for household consumers to buy locally and regionally grown products directly from producers. One of the main purposes of a regional food hub; however, is to provide producers with access to larger volume markets as an alternative to direct-to-consumer marketing options. Regional food hubs do this by actively coordinating supply chain activities, seeking new markets for producers, and building strategic partnerships with processors and other distributors. This allows the producer members of the food hub to meet the quality and quantity requirements demanded by commercial and institutional buyers. By contrast, in most cases, managers of farmers markets or public markets are not involved in such activities and therefore would not be considered regional food hubs.

Support needed to develop a food hub:

- Financial
- Innovative and flexible business strategies
- Business services
- Technical assistance on facility design and operations
- Building effective networks and peer-to-peer learning platforms
- Community support and wider stakeholder engagement

Source: <http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5097957>

Several entities including the Cincinnati Union Cooperative Initiative (CUCI), Findlay Market and Gabriel's Place have investigated the feasibility of a creating a Food Hub. A detailed feasibility study was completed by CUCI in 2012.

Who will be the targets for this recommendation?

The targets of this program are small to midsize producers, especially those who produce fruits and vegetables and can benefit from incentives described in this recommendation.

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can help with the organization of a food hub.

Is it feasible?

Some obstacles to achieving this recommendation include:

- Distributional inefficiency
- Balancing supply and demand
- Price sensitivity
- Managing growth
- Access to capital
- Farmers sometimes view connecting with sellers and distributors as an extra cost
- Certification of small scale farmers

How much would it cost?

Many federal grant and loan programs could potentially finance various aspects of food hub operations. The National Food Hub Collaboration has identified more than 30 of these federal programs (20 programs from USDA alone) that either have a proven track record or have the greatest potential to fund food hub work. Table 1 on page 35 lists each program's eligible applicants and funding activities.

Source: <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5097957>

Are there other positive impacts?

A regional food hub will provide the following benefits:

Operational Services

- Distribution
- Aggregation
- Brokering
- Branding and market promotion
- Packaging and repacking
- Light processing (trimming, cutting, and freezing)
- Product storage

Producer Services

- Actively linking producers and buyers
- Transportation, on-farm pick up
- Production and post-harvest handling training
- Business management services and guidance
- Value-added product development
- Food safety and good agricultural practices (GAP) training
- Liability insurance Community

Environmental Services

- Increasing community awareness of “buy local” benefits
- Distributing to nearby food deserts
- Food bank donations
- Youth and community employment opportunities

Source: <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5097957>

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term: Develop policies and incentives to support small to midsize food processors – particularly any food hub initiatives.

Green Cincinnati Plan –Food Recommendation Develop Local Purchasing Guidelines and Incentives

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on developing a plan for local purchasing guidelines and incentives for governments, hospitals and institutions. These guidelines should be distributed these organizations because many of these places may not be familiar with purchasing local foods. This created an opportunity to communicate how the process works and what benefits are gained from purchasing local foods. Companies such as Procter & Gamble (P&G) already have these guidelines in place on a company level. Using P&G's plan as a resource, along with any other current guidelines from institutions, hospitals or governments with a current plan, would be an efficient way to develop a guide that could be given out as a reference and educational piece.

Strategies for this Recommendation

Cleveland Adopts Incentives

The Cleveland-Cuyahoga Food Policy Coalition developed a new policy to attract and create local, sustainable business. New legislation allows the city to offer a five percent discount to local food businesses bidding for city contracts. Since most bids are decided by five percent or less, a discount for being a certified Local Sustainable Business—a process that will be determined by the Cleveland Office of Sustainability—offers an advantage.

Source: <http://www.gcbl.org/blog/marc-lefkowitz/cleveland-adopts-local-food-incentives>

Greater Cincinnati Green Business Council

The [Greater Cincinnati Green Business Council](#) has a model for developing best green practices. In 2012 they issued a [Workplace Composting Toolkit](#) using shared experiences to develop a best management plan for organic wastes – often originating from cafeteria operations. A similar toolkit can be developed for sourcing food locally to cafeteria and institutional food operations. P&G has had some success with their cafeteria contractor, Compass, and their produce subcontractor, Produce One. The learning from this effort could be compiled and developed into a guide like the Workplace Composting Toolkit.

The Greater Cincinnati Health Council Sustainable Produce Initiative

The [Health Council's Sustainable Produce Initiative](#) aims to strengthen the regional economy and farming industry, as well as, decrease the carbon footprint of product distribution by working with local growers to provide home grown vegetables and fruits to Council hospital and affiliate members.

This initiative runs from July through October each year and is a collaboration between the Health Council, Health Council members and the food service distributor Ellenbee Leggett.

In addition, Farmer's Markets are held at Council member facilities and allow employees to purchase farm-fresh produce during their workday. Also, Seed to City is a community-supported agriculture (CSA) program piloted at one hospital and set to expand to others. Through participation in CSA, hospital employees purchase a weekly box of produce from local farmers, conveniently delivered to their work site.

Who will be the targets for this recommendation?

Local institutions, hospitals, schools and governments

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can help in organization and distribution of the guidelines. The City can partner with organizations in development and execution stages of incentives.

Is it feasible?

Some possible restrictions of this recommendation include:

It is possible to enforce policies to require institutions to purchase local foods; however, there are some stipulations, which should be taken into consideration. Locally grown food laws that require, or provide incentives for, purchasing food grown within a defined geographic boundary are vulnerable to challenge under the U.S. Constitution. There are restrictions under the Constitution on local and state laws that discriminate against goods and commerce from other states.

Policymakers and advocates for local food should understand the impact of these restrictions and should take advantage of an important exception to these restrictions when drafting policies to encourage purchase of locally grown food. Source: <http://www.agdevjournal.com/volume-1-issue-1/115-laws-to-require-purchase-of-locally-grown-food-and-constitutional-limits-on-state-and-local-government-suggestions-for-policymakers-and-advocates.html?catid=58%3Aopen-call-papers-vol01-issue1>

How much would it cost?

Minimal – the promotion of these guidelines can be incorporated into existing communications

Are there other positive impacts?

- More business for local farmers
- More fresh foods being purchased in the area
- Health benefits of people eating local, fresher foods

Are there possible unintended impacts? No.

Timeline for Implementation

Mid-term: Development and implementation of local purchasing guidelines incentives.

Green Cincinnati Plan – Food Recommendation Support 10 Percent Shift to Local Food Campaign

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on supporting the current 10 Percent Shift to Local Food campaign encouraging eating fresh, local foods in homes and businesses. **In most communities, less than three percent of food consumption is locally-grown and locally-produced.** The campaign looks to invite individuals, families, businesses, and restaurants to shift 10 percent of their current food budget to purchase local food, which includes food that is raised, processed, cooked, distributed and sold by people in Greater Cincinnati.

Based on the findings from the Grand Rapids study by Civic Economics, it is clear even just this 10 percent shift from non-local to local spending will have a profound impact on the local economy because of the multiplier effect – a larger share of residents dollars will stay in the region and work to strengthen Cincinnati and the surrounding communities.

Source: <http://www.somervillelocalfirst.org/campaigns/10-percent-shift/>

If 10 percent of the region's population shift 10 percent of their food purchasing to locally sourced fresh fruits and vegetables, it would result in over \$49,000,000 infused into the local economy.

Source: <http://greenumbrella.org/local-food-pledge>

Actions people can take to meet the 10 percent goal:

- Patronize restaurants and grocers who source locally.
- Shop at the farmers markets.
- Adopt a farm and become a CSA member (community supported agriculture).
- Eat what's in season. It won't have traveled as far as out-of-season fruit and vegetables.
- At your grocer, check the labels. Buy the product that comes from the nearest source.
- Learn to grow at least some of your own food. Get a community garden plot or start a veggie patch in your yard. Take reskilling classes if you need how-to help.

Source: <http://eatlocalguide.com/bouldercounty/local-food-shift-pledge/>

Examples, Strategies and Resources for this Recommendation

Northeast Ohio Study – 25 Percent Shift

The study was initiated by major institutions in Cleveland such as the Cleveland Foundation, ParkWorks, Kent State University Cleveland Urban Design Collaborative, Neighborhood Progress, Inc., and the Cleveland-Cuyahoga County Food Policy Coalition Northeast Ohio Study. The purpose of the study was to analyze the effects a 25 percent shift to local food would have on the Cleveland region. The study can be used by Cincinnati as a resource for a strategic action plan that could immediately strengthen local networks, identify the most innovative efforts already taking place in Northeast Ohio, and engage key stakeholders to seize new opportunities for food localization.

Source: <http://www.community-wealth.org/pdfs/news/recent-articles/04-11/report-masi-et-al.pdf>

Boston Hospital Case Study

Massachusetts General Hospital (MGH) worked with The Food Project and MA Farmers Market to distribute \$30,000 worth of farmers' market coupons that could be redeemed for fruits and vegetables at any farmers' market in Massachusetts. The goal of the program was to raise awareness about farmers' markets and to encourage Massachusetts residents to add more fruits

and vegetables to their diets. The MGH coupons were valued at \$2.50 each, and 12,000 coupons were distributed.

Source: http://thefoodproject.org/sites/default/files/bfm_incentive_pgms.pdf

Policy and Program Options

Food policy councils

State and local policymakers can pass a resolution for a food policy council or task force that advances healthy food options and includes farmers' markets. There is a Cincinnati Food Policy Council, which could also help with policies and programs.

Financial incentives to market operators

Local and state policymakers can support underserved communities and local farmers by providing incentives, grants and subsidies to create farmers' markets in those areas. Local government officials can also support farmers' markets by aiding in their development and promotion.

Coupons and lower-income incentives

Local and state governments can encourage farmers markets to accept Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and Supplemental Nutrition Assistance Program (SNAP) benefits. For example, governments can provide subsidies to farmers markets to accept electronic benefit transfer (EBT) cards from SNAP. Local policymakers can encourage market managers to offer residents in lower-income areas products that are affordable by providing financial support to farmers' market operators at the outset. Market managers can then agree to lower vendor fees to farmers so they can offer lower prices.

Source: <http://www.leadershipforhealthycommunities.org/index.php/action-strategies-toolkitmenu-122/farm-fresh-local-foods-toolkitmenu-135?task=view>

Green Bean Delivery and local Farmers and Processors –

Central Ohio River Valley Local Food Directory (CORV Guide) <http://eatlocalcorv.org/PDFs/CORV-2012-Web.pdf>

Edible Ohio Valley

<http://www.ediblecommunities.com/ohiovalley/>

Green Bean Delivery

<http://www.greenbeandelivery.com/cincinnati/index.php/what-we-offer/local-vendors/>

Other areas participating in similar campaigns:

- Boulder, CO
- Somerville, MA
- North Carolina

Who will be the targets for this program?

The target for this program will be all local businesses and residents in Cincinnati.

How can the City of Cincinnati influence the initiation of these programs?

The 10 Percent Shift to Local Food campaign is already an active campaign throughout areas and organizations in Cincinnati. This recommendation focuses on how the City can further be involved to support the 10 percent campaign initiative. Strategies for helping the City to grow its 10 percent shift campaign are detailed throughout this recommendation. City institutions also need to make the 10 percent shift and lead by example when supporting this campaign.

Is it feasible?

Some obstacle to achieving this recommendation include:

- Reaching all potential participants

How much would it cost?

Cost includes promotion and marketing to increase awareness and participation in the campaign.

Are there other positive impacts?

The benefits of the 10 percent shift campaign include:

- Expanded Job Creation: Creating new jobs and decreasing unemployment
- Economic Growth: Generating increased local economic activity
- Entrepreneurial Ventures: Inspiring the formation of new independent ventures.
- Protected Environment: Decreasing thousands of tons of greenhouse emissions caused by trans-regional and transnational transportation of goods
- Enhanced Communities: Revitalizing communities that have suffered from non-local spending
- Increased health benefits

Source: <http://www.somervillelocalfirst.org/campaigns/10-percent-shift/>

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term: The City can partner with Green Umbrella and other organizations in supporting this campaign. The City can take the lead on encouraging participation in the campaign from its residents, institutions, schools and employees.

Green Cincinnati Plan –Food Recommendation Eating More Fruits and Vegetables

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on the promotion of eating more fruits and vegetables. Three of every four Americans fail to eat vegetables at least three times daily, and two out of every three fail to eat two fruits daily, according to a new survey by the Centers for Disease Control and Prevention. These results indicate most U.S. residents aren't taking one of the simplest preventative health steps: eating the suggested amount of fruits and vegetables. Fruits and vegetables have been shown to build up our immune systems, lower blood pressure, help us lose weight and reduce the risk for many leading causes of death including cancer and heart disease.

Source: <http://www.thedailygreen.com/healthy-eating/latest/eat-more-fruits-vegetables#ixzz283ALECGX>

In addition to eating more fruits and vegetables, Americans could improve their health by eating less meat. There is no question that meat in moderation can be a good source of complete protein and key vitamins and nutrients such as iron, zinc and vitamins B-12, B-6 and niacin. For many, meat is an important aspect of their diets. At the same time, the scientific evidence is increasingly clear that eating too much meat – particularly red and processed meat – is associated with a wide variety of serious health problems.

Americans eat more meat than most other developed nations. In 2009, the U.S. produced 208 pounds of meat per person for domestic consumption, not including seafood. That's nearly 60 percent more than Europe produced (134 pounds per person), and nearly four times as much as developing countries. Recent research suggests that eating all this meat is contributing to the U.S. obesity epidemic. In addition, other research now links consumption of meat, particularly red meat and processed meats, with a wide array of chronic diseases and serious health problems such as cancer and heart disease.

Source: [Environmental Working Group](#)

In addition to health impacts, the production of meat, particularly red meat, has major impacts on the environment including air and water quality and greenhouse gas emissions. Cows and sheep are ruminants that constantly generate methane through their digestive process and methane is a greenhouse gas 25 times more potent than carbon dioxide (CO₂). Pound for pound, ruminants also require significantly more energy-intensive feed and generate more manure than pork or chicken.

Strategies for this Recommendation

Meatless Monday

Meatless Monday is a non-profit health initiative in association with the Johns Hopkins Bloomberg School of Public Health and seeks to educate the public about the benefits of reducing meat consumption. Just one meatless day a week cuts one's saturated fat intake by an impressive 15 percent, reducing their risk of chronic, preventable illness, as well as the costs associated with treatment. This campaign encourages people around the world to go meatless one day a week for their health and the health of the planet.

The City of Covington and NKU have adopted the Meatless Monday campaign. City of Cincinnati employees are encouraged to participate through the City's Healthy Lifestyles Program. The City can use these local efforts to identify strategies for implementing Meatless Mondays citywide.

The Meatless Monday website has toolkits for developing general, campus, community, or company campaigns. This can be a useful tool for using as a model to develop the City's campaign. Some tips for developing a communitywide Meatless Monday Campaign include:

- A letter writing campaign
- Creating an event
- Partnering with local restaurants

Sources: http://www.meatlessmonday.com/images/photos/2010/08/mm_community_kit.pdf
<http://meatlessmonday.tumblr.com/>

Fruits & Veggies - More Matters

Fruits & Veggies - More Matters is a national public health initiative from Produce for Better Health Foundation and Centers for Disease Control and Prevention (CDC) to increase the consumption of fruits and vegetables.

Source: http://en.wikipedia.org/wiki/Fruits_%26_Veggies_-_More_Matters

Vegan Earth

Vegan earth hosts a vegan potluck every third Sunday at the Clifton United Methodist Church for those interested in learning more about a vegan diet.

Source: <http://www.veganearthus.org/Index.html>

Who will be the targets for this program?

All residents within the City of Cincinnati can be targeted with this campaign.

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati already is leading by example through its Healthy Lifestyles Program's Meatless Mondays campaign. The City needs to further communicate this message and campaign to local businesses, restaurants and residents to increase the number of participants and increase the health of Cincinnati residents.

Is it feasible?

What are some obstacles of this plan:

- People may not be willing to give up meat even if it's just for one day

How much would it cost?

Communication/promotional materials

Are there other positive impacts?

- Reduced greenhouse gas emissions
- Improved air and water quality
- Lower health care costs

Are there possible unintended impacts? No.

Timeline for Implementation

Short-term: This plan can be implemented through promotion of the campaigns mentioned to increase the amount of fruits and vegetables consumed.

Green Cincinnati Plan –Food Recommendation City Compost Program

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on assessing, developing and implementing a City compost program that assists residents and businesses to compost food waste and food packaging. The City of Cincinnati needs a program that allows recycling of wastes locally and makes composting available for local food production.

In some areas, food scraps account for nearly 33 percent of most people's trash. Instead of having organic material and food scraps being sent to landfills, it could be used beneficially. According to the EPA, in 2010 yard trimmings and food scraps account for 27 percent of municipal solid waste (MSW) in landfills. This figure makes yard trimming and food scrap are the second largest component of MSW generation.

Source: <http://www.epa.gov/epawaste/nonhaz/municipal/index.htm>

Cincinnati already has a facility, which can handle composting in the City. Compost Cincy is Cincinnati's urban commercial composting facility and the nation's only compost facility within city limits. Compost Cincy specializes in recycling all types of food, yard and other various types of organic waste. All types of organic waste that cannot be recycled using traditional techniques whether it is wax covered cardboard, wood chips, produce, meat and poultry products, food scraps, manure and straw as accepted. There are currently three organics carts outside of Compost Cincy, which are available for residents to dispose of their compostable materials. Source:

<http://www.compostcincy.com/about.html>

Examples for this Recommendation

Ottawa

In March 2009, Ottawa, Canada began the Green Bin Program to collect residents' organic food waste in curbside composting bins. Ottawa diverted over 100,000 tons of organic material in the first two years of the Green Bin Program. Prior to the Green Bin Program, the city's diversion rate, according to Waste Diversion Ontario (WDO) data, ranged from 32.2 percent and 33.2 percent between 2006 and 2009. Following the introduction of the Green Bin Program, the WDO diversion rate for 2010 rose to 38.8 percent.

Source: http://www.nyc.gov/html/unccp/gprb/downloads/pdf/Ottawa_GreenBin.pdf

San Francisco

San Francisco recently passed a stringent measure requiring all single-family households, businesses and multi-tenant buildings to compost food scraps. The law goes into effect later this month and is part of the city's "zero waste" policy, which aims to stop the flow of all waste to landfills and incinerators by 2020. The City of San Francisco is handing out free composting bins, and garbage haulers will accept the discarded food waste as part of the weekly trash and recycling pickup. Fines for noncompliance range from \$100 for households to \$1,000 for large waste generators. There are positive incentives for complying with the law, too: People who compost should see a reduction in their garbage rates, since haulers charge according to the amount of refuse collected.

Materials Give Back Program

Residents of the City of Rochester, New York are allowed to bring their own shovels and containers for collecting materials such as compost, woodchips and stone chips. The City of North Olmstead

Ohio also offers compost for free at its compost site. This service is not currently offered at Compost Cincy.

Who will be the targets for this program?

Residents and businesses in the City of Cincinnati

How does it affect GHG emissions?

See Waste Chapter

How can the City of Cincinnati influence the initiation of these programs?

The City is already promoting food scrap collection by leasing City property to CompostCincy. The collection of yard debris is included in the 2013 City Manager's budget.

Is it feasible?

What are the obstacles to achieving this plan:

- Many cities have drop-off compost programs that are underutilized. As an urban dweller; however, it can be difficult to haul one's own food scraps to the closest drop-off center. Some cities that have implemented pilot curbside composting programs have seen an initial lack of interest or knowledge kill the budding programs. Initially, some people just couldn't seem to get past the "ick" or "smell" factor. Most communities who started food scrap collection already had a yard waste collection program, so adding the material would didn't add substantial cost. Still, in these cities, even if it was more expensive, allowing pick-up in front of homes in residential neighborhoods would help the practice by increasing the convenience.

Source: <http://www.treehugger.com/corporate-responsibility/5-great-green-ways-us-cities-are-leading-by-example.html>

- Lack of uniform acceptance of compostable packaging at composting facilities. The SPC survey highlights the fact that the types of food packaging products accepted by these facilities vary widely (see chart on the right) as do the standards to which they hold these products, with 47.5 percent of facilities requiring ASTM certification, 37.5 percent requiring BPI certification, and 20 percent requiring some form of on-site testing. These variations in requirements across geographic markets make it very difficult for manufacturers to build certified compostable products that can be composted by facilities anywhere in the country.
- Lack of uniform labeling on compostable packaging

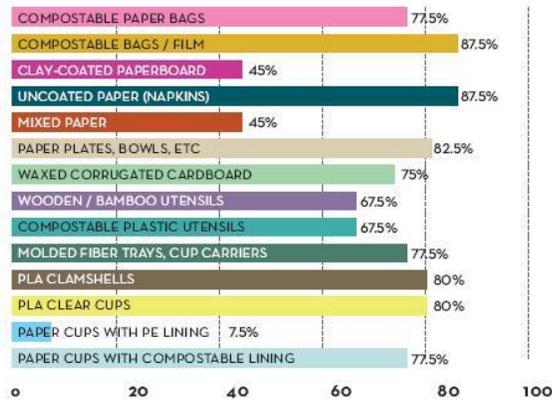


FIGURE 7: Types of Compostable Products Accepted, Percent by Facilities

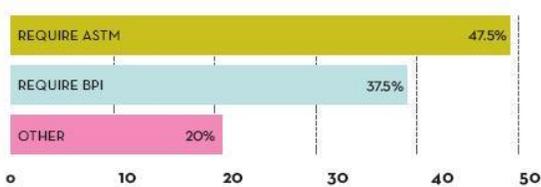


FIGURE 8: Certification / Specification Requirements, Percent by Facilities

State composting regulations can be found on the Ohio EPA website:

<http://www.epa.ohio.gov/dmwm/Home/Composting.aspx>

How much would it cost?

Ottawa's Green Bin Program was initially rolled out to 220,000 residential households. The one-time only implementation costs, which included two sizes of bins delivered to each household, user guides and promotional/outreach materials, totaled approximately \$51 per household. The operational cost of the Green Bin Program, which includes promotion, collection and processing costs, was approximately \$14 million for 2011. According to the 2010 U.S. Census, there were 133,420 households within Cincinnati city limits so costs would probably be less than those stated for the Ottawa example.

Source: http://www.nyc.gov/html/unccp/gprb/downloads/pdf/Ottawa_GreenBin.pdf

Are there other positive impacts?

- Bi-products of composting can be resold (mulch)
- Reduced landfill costs
- Potential fuel savings (CompostCincy is closer than the Rumpke landfill)
- Reduced greenhouse gas emissions

Are there possible unintended impacts?

- Odor
- Impact on existing compost/mulch and soil amendment businesses

Timeline for Implementation

Short-term: Implementation for yard debris and commercial food scraps. Promotion of local drop-off sites or backyard composting for residents.

Long-term: Implementation for residential food waste collection.

Green Cincinnati Plan –Food Recommendation Promote Education & Awareness of Local Food

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on promoting education and awareness regarding local food sources, production and accessibility in the Cincinnati region. It is important for people to understand the abundance of resources currently available in regards to local food options. This recommendation can also help increase the region's attractiveness for local farmers to continue investing, growing and selling foods grown locally.

Resources for Those Interested in Local Foods

Cincinnati Locavore

Cincinnati Locavore is an online resource for people interested in local foods in the Cincinnati region. The blog highlights topics such as recipes, events and local food stories in the news. Source: www.cincinnati-locavore.blogspot.com

Central Ohio River Valley (CORV) Local Foods

CORV Local Foods Initiative is a grassroots effort to educate the community about the value of locally and sustainably grown foods, as well as to connect local community members with local growers/farmers and markets. Each year CORV comes out with the CORV Eat Local and Sustainable Guide. In 2012 the guide was released in the April 13th edition of *City Beat*. The guide can also be obtained by mail with a three-dollar contribution or found for free at numerous farmers markets or online.

Source: www.eatlocalcorv.org

Edible Ohio Valley

Edible Ohio Valley is a community-based publication that promotes the local food, farms and cuisine of the Ohio Valley.

Source: <http://www.ediblecommunities.com/ohiovalley/>

Ohio Produce Growers & Marketers Association (OPGMA)

OPGMA is an organization of Ohio produce growers and marketers working to produce exceptional quality crops for customers and processors, utilizing environmentally friendly practices. The group association works to streamline the educational and promotional activities of the Ohio's produce growers and marketers. OPGMA has been designed to aid in providing educational opportunities to business owners, employees and families associated with the production and marketing of the states' fresh produce industry.

Source: <http://www.opgma.org/>

The Ohio Ecological Food and Farm Association (OEFFA)

OEFFA was formed in 1979 and is a membership-based, grassroots organization, dedicated to promoting and supporting sustainable, ecological and healthful food systems. There are multiple regional chapters of OEFFA in the Cincinnati/Dayton region - OK River Valley Chapter (Brown and Adams counties in Ohio and Mason and Robertson counties in Kentucky), Little Miami Chapter (Clinton, Fayette, Greene, and Montgomery counties), Southwest Ohio Chapter (Hamilton and Clermont counties), Miami/Oxford Organic Network (MOON) Chapter (Butler, Preble, and Warren counties).

Source: <http://www.oeffa.org/index.php>

Civic Garden Center

The *Civic Garden Center* is a non-profit horticultural resource that enriches lives through education, community beautification and environmental stewardship. The Civic Garden Center hosts classes, community garden training development and group presentations.

Source: <http://www.civiggardencenter.org/>

Close-in Local Farms

Grailville – Granny’s Garden School

Granny’s Garden School is a non-profit focused on developing, promoting and supporting hands on learning experiences through school-based garden and nature focused programs to help children experience nature and the satisfaction of growing their own food. Granny’s Garden School is one of the largest and most comprehensive school garden programs in the country that has set the standard for merging school gardens with the classroom.

Source: www.grailville.org

Turner farm

Turner Farm is Certified Organic by the Ohio Ecological Food and Farm Association (OEFFA). The growers utilize energy efficient, biological principles to produce nutritional, bio-diverse organic foods. Compost and natural plant-based supplements help create and maintain healthy soil and plant life. Integrated pest management safely controls crop damage without use of harmful pesticides. Artificial chemicals and synthetic fertilizers are not used. <http://www.turnerfarm.org>

Gorman Farm

Gorman Heritage Farm is a 122-acre working farm and outdoor education center, which invites its visitors to explore and learn the history, methods and values of a working family farm in a natural setting. Located on Reading Road in Evendale, the Farm consists of 30 tillable acres, a farmyard with a variety of animals, a garden, 40 acres of wooded hillside, and a natural pond. Source:

<http://gormanfarm.org/>

Amberley Village Green Project

Amberley Green is more of a potential close-in farm, rather than a working farm. Located at Ridge and Galbraith Roads, Amberley Green is a 133-acre park. For 50 dollars a growing season, a 9 X 15 garden plot is provided. Access to a garden cart, water and the Amberley Garden education series is also included. Ongoing planning has the potential to make the Amberly Village Green Project the next “in-town” local farm.

Source: <http://www.amberleyvillage.org/recreation.cfm>

Education for Children

Education and awareness of healthy foods grown locally should be promoted to children at a young age. This is important because if children grow up learning about the importance of healthy food practices, it will be more likely these practices will become habits and continue to be utilized throughout their lives. Educating children in school about environmentally friendly and sustainable farming practices can also be used as a tool to recruit children interested in farming in order to grow more local growers.

The City of Cincinnati can partner with Cincinnati Public Schools (CPS) and the Health Department to promote the education and awareness of healthy foods. Through CPS, students in Kindergarten through grade 12 will be able to have continuous learning that can build upon itself year after year regarding local foods and sustainable farming practices. The Health Department's partnership can be integrated through the school nurse who can provide the students with information about health and nutrition benefits that are a result of eating locally grown foods.

Other Potential Partners for Advocating and Educating About Local Foods

- Civic Garden Center (www.civigarddencenter.org)
 - Education/information to individuals, schools, organizations, businesses
 - Horticultural resource – eight acres
 - Neighborhood Gardens – 23 communities, over 47 active gardens
 - Compost Kids and Summer Sprout – introduce young people to gardening
- Hamilton County Recycling and Solid Waste District (hamiltoncountyclecyles.org)
 - Promotion of properly composting
 - How to obtain recycled/composted materials to enrich soil for growing
- Hamilton County Soil and Water Conservation District (www.hcswcd.org)
 - Assist in developing rain gardens
 - Information on soil and water safety
 - Agriculture, land management, utilizing urban streams
 - Promoting Farm Security and Rural Investment Act of 2001 – assist farmers and ranchers in meeting environmental challenges on their land
 - Soil testing for a nominal fee

Who will be the targets for this recommendation?

Citizens of all ages of Cincinnati will be targets for this recommendation.

How can the City of Cincinnati influence the initiation of this recommendation?

Promotion of the resources called out in this recommendation and others like them.

Is it feasible?

Given the number of existing resources, this recommendation is feasible.

How much would it cost?

Promotion needed to build awareness

Are there other positive impacts?

- Health and nutrition benefits
- More business supporting local farmers
- Economic risk reduction
- Improved market access opportunities

- Reduced transportation – less pollution from trucks, etc.
- Crop variety
- Food security
- Better freshness and flavor

Are there possible unintended impacts? No.

Timeline for Implementation

Short-term: Promotion to increase awareness of these opportunities to be exposed to and learn about food grown locally.

Action Plan Ideas for Interested People to Begin Supporting Local Foods

- Visit a local farmers market
- Plant something you like at home (herbs, tomatoes, vegetables, etc.)
- Ask for local foods at the grocery store and find out what the store means by “local”
- Try a restaurant that features locally grown foods
- Buy extra of your favorite foods when they are in season and preserve them to eat later
- Plan one meal a week around locally grown vegetables
- Check resources for groups to join or support
- Try to eat less meat and reduce GHG emissions by having a meatless day once a week
- Ask about growing and raising practices to encourage sustainable, humane ones

Source: www.eatlocalcorv.org

Green Cincinnati Plan – Water Recommendation Reduced Combined and Sanitary Sewer Overflows

What is it?

Every year, about 11.5 billion gallons of raw sewage – mixed with storm water – overflows from our sewers into local streams and rivers and also backs up into basements. This is not an accident or oversight, but the result of a sewer system designed to meet the needs of an earlier generation, not our modern society. Our community experiences two different types of overflows: combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs).

The sewers built in the older portions of MSD's service area, like the City of Cincinnati, carry both sewage and storm water in the same pipe. Known as combined sewers, they comprise about 40% of MSD's current sewer system and are nearly 180 years old in parts.

During heavy rains, combined sewers are often filled beyond their capacity. To relieve pressure on the sewer line and prevent widespread flooding and sewage backups into buildings, combined sewers were designed to overflow directly into local streams, creeks, and rivers through outfall structures known as combined sewer overflows or CSOs. At the time they were built, CSOs were an acceptable way of handling excess flows, but their environmental impacts are now controlled under the present regulations of the federal Clean Water Act.

By the mid-20th century, combined sewers were largely discontinued in favor of separated sanitary sewer and storm water lines.

In newer areas of Cincinnati and suburban "bedroom communities" that surround the city, sanitary sewage and storm water are handled in separate sewer lines.

During heavy rains, however, storm water can enter sanitary sewer lines through manholes, defective sewer pipes, and illicit connections (e.g., downspouts connected directly to the sanitary sewer). If the sanitary sewer line is filled beyond capacity, it will overflow through sanitary sewer overflow (SSO) relief structures (constructed as part of manholes) or through manhole lids into local waterways, adjacent yards, and streets. SSOs are considered a greater danger to public health than a CSO, and therefore are not permitted under the Clean Water Act.

Source: <http://projectgroundwork.org/problems/wetweather.htm>

Why is it important to the City of Cincinnati?

There are many problems and complications that can be caused by SSOs and CSOs.

Problems caused by SSOs and/or CSOs include:

- Water quality impairment attributed in part to pathogens and other urban stormwater pollutants

- Under-utilized recreational opportunities due to low flows, contaminated water, , impacted biota, degraded visual appearance (color, odor, algae, trash, weeds)
- Reduction in visual character/quality of neighborhoods with polluted waterways and concrete channels
- Depressed biodiversity/ decreased abundance of native flora and fauna
- Clean Water Act – violated by discharge of CSOs into surface water

Are there other positive impacts of controlling SSOs and CSOs?

- Reduce sewer surcharging, reduced sewage in basement issues
- Reduced localized flooding
- Enhanced opportunity for community and stakeholder input
- Opportunities for redevelopment
- Greater flexibility for future decision-making
- Numerous ecological benefits of restoring surface streams, increasing vegetative cover, reducing impervious surfaces

What areas will be targeted for this recommendation?

There are four watersheds that MSD is targeting for CSO reduction as part of its proposed Lower Mill Creek Partial Remedy: Lick Run, West Fork, Kings Run, and Bloody Run. The projects in these watersheds include some or all of the Cincinnati neighborhoods of South Fairmount, Westwood, West Price Hill, East Price Hill, Northside, Spring Grove Village, Winton Hills, and Bond Hill.

Who are potential key partners for this recommendation?

- Metropolitan Sewer District of Greater Cincinnati
- Groundwork Cincinnati/Mill Creek (formerly the Mill Creek Restoration Project)
- Mill Creek Watershed Council of Communities
- Community Involvement: MSD is employing multiple communication channels for community input on wet weather improvement program (WWIP)
- Lower Mill Creek Watershed Action Plan Workgroup In addition to those listed above: Cincinnati Park Board, City of Cincinnati Planning and Buildings, OKI, Hamilton County Planning and Development, Hamilton County Soil and Water Conservation District
- Green Umbrella

How can the City of Cincinnati influence the implementation of this recommendation?

The City of Cincinnati can have a direct impact in the implementation of this recommendation because the City operates the sewage treatment facilities and can have strong input on the ways to manage these overflow issues. The Green Cincinnati Plan supports MSD's recommendation to implement the sustainable hybrid approach to reduce SSOs and CSOs in the Mill Creek. Details of this approach are described below:

- The sustainable/hybrid approach focuses on implementing sustainable infrastructure projects in Lick Run, West Fork, and Kings Run including large-scale sewer separations, stormwater detention basins, naturalized/new channels, stream restoration, combined

storage, small enhanced high-rate treatment (EHRT) facility, and a real-time control facility in Bloody Run.

- The Green Cincinnati Plan also supports the preliminary findings of the Lower Mill Creek Watershed Action Plan. The Action Plan will likely be completed by late 2013. To devise this plan, a working group is planning for water quality improvements by utilizing the 2011 Midwest Biodiversity Institute Mill Creek Bio-assessment Survey. Once finalized, the action plan will prioritize water quality impairments in the Mill Creek and its tributaries and suggest possible remedies ranging from on-site BMPs to community outreach and education campaigns to new water-quality-supporting legislation (e.g. a riparian buffer ordinance).

Is it feasible?

Since 2009, MSD has undertaken a comprehensive effort to evaluate potential “grey” and “integrated watershed sustainable solution” to substantially reduce combined sewer overflows into the Mill Creek by 2018. MSD’s evaluation process has determined that not only is an integrated watershed sustainable solution feasible, but it is more cost effective than a traditional grey solution.

How much would it cost?

MSD’s Revised Original Lower Mill Creek Partial Remedy (LMCPR), which includes the projects known as the “integrated watershed sustainable solution,” will cost \$244.3M (2006\$) or \$0.23/gallon in 2006 dollars. This is compared to the “grey” solution’s (Default Plan) projected cost of \$414.4M (2006\$) or \$0.40/gallon in 2006 dollars.

Are there possible unintended impacts?

- Projects impact erosion and sediment control
- Displacement of residents and businesses

Timeline for Implementation

Short-Term (One to Two Years): MSD will begin to construct projects included in the Revised Original Lower Mill Creek Partial Remedy. The Lower Mill Creek Watershed Action Plan will be completed to help guide regional water quality improvement efforts. The City will encourage residents and businesses to adopt stormwater best practices including rain barrels, bioswales, cisterns and other rainwater harvesting and retention techniques.

Mid-Term (Three to Four Years): MSD will complete construction of more projects outlined in the LMCPR, and will begin to plan future Phase II (post-2018) projects.

Long-Term (Five to Six Years): MSD will complete all projects described in the LMCPR by December 31, 2018 and will focus on Phase II solutions.

Green Cincinnati Plan – Water Recommendation Watershed Restoration

What is it and why is it important to the City of Cincinnati?

The restoration of a watershed involves returning the ecosystem to as close an approximation as possible to its natural state. The restorative process includes the remediation of the water quality, repairing the source of the water damage, and repopulating the watershed with plant and animal species. This recommendation is essential to the City of Cincinnati where many streams and the watersheds that drain to them have been impacted by centuries of urban development. Practices that were once considered standard operating procedures such as channelizing and burying streams have had detrimental long-term effects that will be remediated and in some instances reversed.

Strategies to achieve watershed restoration:

- *Water quality monitoring program enhancement/expansion*

Monitoring can help identify areas of impaired water quality and measure progress. Enhanced monitoring can help locate areas of concern and the appropriate water quality strategy to address the impacted water body.

- *Riparian corridor protection*

Riparian corridors are the interface between land and a river. Riparian zones with native vegetation and soils provide multiple functions and values. They are the first line of defense against the impacts of impervious surfaces. Natural riparian areas slow runoff, protect stream banks from erosion, aid in flood control, and filter or trap pollutants. They provide habitat and corridors for wildlife, as well as shade waters for fisheries enhancement. Intact riparian corridors may provide scenic value and recreational opportunities. For these reasons, zoning ordinances and proper enforcement should be used to protect these areas.

Sources: http://en.wikipedia.org/wiki/Riparian_zone & <http://clear.uconn.edu/tools/habitats/riparian.htm>

- *In-stream stabilization*

As early stages of erosion become apparent, in-stream stabilization techniques, such as native vegetation or other methods, should be incorporated into the river or stream.

- *Low-head dam mitigation*

Low-head dams cause a dangerous “roller” effect. The powerful churn created by the water that pours over these dams presents a hazard for fish, boaters and anglers. These safety concerns call for the City to increase low-head dam mitigation. Low head dams also impeded the movement of fish.

Source: http://www.iowadnr.gov/portals/idnr/uploads/riverprograms/dam_chap1.pdf

- *Hilltop detention in developed areas*

Given Cincinnati’s steep hillsides often associated with highly erodible soils, it is imperative to slow water down before its travels down these slopes. Areas of development on the top of these slopes can lead to excessive runoff that exacerbates erosion and stream

channelization. Where appropriate, detention basins should be constructed to slow down the stormwater.

- *Bioretention/detention*

Bioretention systems use filtration to treat stormwater runoff. These systems use vegetation such as trees, shrubs and grasses to remove pollutants from stormwater runoff. Implementing this system will allow for stormwater peak flow and volume control, as well as water quality benefits where there is stormwater infiltration. This cost-effective and efficient strategy can easily be incorporated into existing greenways.

Source: http://www.tentowns.org/10t/docs_etc/bioreten.pdf

- *Reforestation*

Reforestation can be used to soak up [pollution](#) and dust from the air, rebuild natural [habitats](#) and [ecosystems](#), mitigate [global warming](#) through [sequestration](#) of atmospheric [carbon dioxide](#) and harvest for resources. Trees and forests improve stream quality and watershed health primarily by decreasing the amount of stormwater runoff and pollutants that reach local waters. Trees and forests reduce stormwater runoff by capturing and storing rainfall in the canopy and releasing water into the atmosphere through evapotranspiration. In addition, tree roots and leaf litter create soil conditions that promote the infiltration of rainwater into the soil. This helps to replenish our groundwater supply and maintain streamflow during dry periods. The presence of trees also helps to slow down and temporarily store runoff, which further promotes infiltration, and decreases flooding and erosion downstream. Trees and forests reduce pollutants by taking up nutrients and other pollutants from soils and water through their roots, and by transforming pollutants into less harmful substances. This strategy is needed near highways, especially interstates, and near streams.

Source: <http://en.wikipedia.org/wiki/Reforestation>
<http://www.forestsforwatersheds.org/reduce-stormwater/>

- *Increase Community Engagement around Watershed Issues*

The Westside neighborhoods that include the steep slopes and deep valleys of tributaries to the Mill Creek and the neighborhoods that line the main stem of the Mill Creek are actively engaged in watershed issues. Other neighborhoods far removed from the creek but located in the watershed should be engaged to take watershed restoration actions.

- *Stream Daylighting*

Stream daylighting involves the reconfiguration of a [stream](#) into an above-ground channel to restore a stream to a more natural state. Daylighting is intended to improve the [riparian](#) environment for a stream which had been previously diverted into a [culvert](#), pipe, or a [drainage](#) system. Stream daylighting projects proposed by MSD in the Lower Mill Creek Partial Remedy involve strategically separating the stormwater flows and natural drainage out of certain sections of existing combined sewer pipes. These stormwater flows will either be put into a new dedicated stormwater pipe or brought to the surface and used to recreate urban waterways that were buried decades ago.

Source: http://en.wikipedia.org/wiki/Daylighting_%28streams%29
<http://projectgroundwork.org/projects/lowermillcreek/sustainable/lickrun/>

- *Septic system maintenance/upgrades*

Although septic systems are typically located outside the City, these systems still have an effect on the City and watershed restoration efforts. Septic systems can discharge a variety of contaminants which can affect surface waters, including nutrients, pathogens, organic matter and solids. For this reason, it is essential to ensure the septic tanks in the area are properly maintained and upgraded when needed.

Source: http://watercenter.montana.edu/training/decisions/landuse/docs/septic_system_impacts.pdf

Local Example – Groundwork Cincinnati/Mill Creek (GWC)

GWC is currently working to create green infrastructure to filter and infiltrate urban stormwater runoff along the Mill Creek. GWC also works to regenerate stream banks, wetlands, and floodplains. The transformation of blighted, derelict properties and brownfields along 4.5 miles of the creek into productive reuse is also a project taken on by GWC.

Best Management Practices (BMPs)

In addition to the above recommendations, the City can engage in best management practices to help effectively tackle watershed restoration including:

- Adopting good housekeeping strategies such as using less de-icing salt, street sweeping and litter prevention.
- Vegetation management
- Rain barrels, rain gardens, and other on-site stormwater solutions

Are there other positive impacts of this recommendation?

- Restoring ecosystems and protecting wildlife
- Keeping water in rivers and streams as clean as possible
- Reducing flooding
- Job creation
- Health benefits
- Increase of property values
- Neighborhood redevelopment

What specific areas will be targeted and what will be the objective in these areas?

- *Stream Daylighting*: Lick Run, Kings Run, Denham Creek, Burnet Woods Park, Hamilton County Fairgrounds
- *Septic system maintenance/upgrades*: Upper West Fork
- *Bioretention/detention*: projects specifically called out in the LMCPR consist of the creation of proposed detention basins in Lick Run (6 basins), West Fork (2 basins), and Kings Run (4 basins).
- *Mainstem Mill Creek solutions*
 - Reforestation/revegetation
 - Habitat creation

- Remove walls on some Mill Creek Valley Conservancy District properties
- Maintenance of best management practices in the corridor
- Riffle buildup downstream of low-head dam sewer crossing
- *I-75*
 - Combined sewer separation
 - Consolidate connections
 - Reforestation (also applies to stream corridors, other roads/highways)
 - Linear BMPs along highway
 - Maintain/improve existing stormwater conveyance along highway (remove from combined sewer system)

Who are potential key partners for this recommendation?

Hamilton County Park District, MSD, Ohio EPA, Mill Creek Watershed Council of Communities, Cincinnati Park Board, Hamilton County Planning and Development, Ohio*Kentucky*Indiana Regional Council of Governments, Butler County Water & Sewer, Hamilton County Park District, First Suburbs Consortium, local neighborhood groups and community councils, Groundwork Cincinnati/Mill Creek

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can partner with the identified organizations to carry out the watershed restoration strategies of this recommendation.

Is it feasible?

Potential obstacles to this recommendation include:

- Enforcing new policies or best practices
- Monitoring all areas to identify need for improvements or progress is being made
- Ensuring watershed community understands the importance of aiding and supporting the restoration process
- Tangibly measuring the success of the restoration process
- Ensuring adequate funding

How much would it cost?

- Employees to oversee watershed restoration
- Equipment to properly carry out different restoration activities
- Education/promotional material for communities with watersheds being restored

Are there possible unintended impacts?

- Watershed areas could be used for other purposes
- Improper restoration could have lasting negative effects on the watershed or ecosystems

Timeline for Implementation

Short-Term (One to Two Years): Complete Lower Mill Creek Watershed Action Plan. Develop cross functional teams to develop improved good housekeeping practices.

Long-Term (Five to Six Years): Detention/bioretention basins. Septic systems to sewer.

Short-Term, Mid-Term and Long-Term (One to Six Years): Enforce best management practices such as using less de-icing salt, vegetation management, rain barrels, rain gardens. Partner with Hamilton County Park District, MSD, Ohio EPA, Mill Creek Watershed Council of Communities, local neighborhoods, Groundwork Cincinnati, Mill Creek to continue stream daylighting, bioretention/detention, main stem Mill Creek solutions, I-75 improvements as specified in plan.

Green Cincinnati Plan – Water Recommendation Water Advocacy

What is it and why is it important to the City of Cincinnati?

Cincinnati has the invaluable benefit of having access to an abundance of water. About 60 billion gallons of water in the Ohio River flows past Cincinnati each day. Greater Cincinnati Water Works draws less than one-percent of that water to treat and distribute to its customers.

A plentiful water supply is essential for many aspects of life in the city including drinking water, indoor plumbing, industrial production and recreation. Cincinnati's abundant supply of water uniquely positions the City for future economic growth. Due to water scarcity in some regions, water is becoming a key economic driver for community development. For this reason, the strategies of this recommendation can help Cincinnati have a competitive edge over other cities in the future.

The City of Cincinnati has a great asset in the Greater Cincinnati Water Works (GCWW), which has been a municipally owned and operated utility since 1839. GCWW continues to be a national leader in water quality research and technology to protect public health, gaining it notoriety and recognition for its state-of-the-art water treatment facilities and processes. . The extensive network making up GCWW supplies more than 48 billion gallons of water a year through 3,100 miles of water mains to about 235,000 residential and commercial accounts. Not only does GCWW serve the City of Cincinnati, but also most of Hamilton County and parts of Butler, Warren, and Clermont Counties in Ohio. In 2003, GCWW started selling water to Boone County and Florence, Kentucky via a pipeline installed under the Ohio River.

Source: <http://www.cincinnati-oh.gov/water/about-greater-cincinnati-water-works/>

Despite being blessed with a plentiful supply of drinking water in the Cincinnati area and a state of the art treatment facility with GAC and UV processes to provide a high quality product, it is still our duty to encourage the efficient use of water in all the homes and businesses of our customers.

Strategies for Water Advocacy:

Encourage drinking GCWW tap water instead of bottled water

Drinking tap water rather than bottled water or sugary drinks has many benefits to the City and its residents. These benefits include safety, affordability environmental, and health.

Safety

- Tap water is constantly checked for biological and chemical contaminants while bottled water is not
- Water utilities monitor for more than 100 contaminants and must meet close to 90 regulations for water safety and quality

- GCWW tests its water more than 600 times a day throughout the water treatment and distribution process

Health

- Consuming about eight 8-oz glasses of water every day is healthy
- Water is the original health drink. It contains no calories, no fat and no cholesterol
- Water helps digest food and prevents acid indigestion

Affordability

- Most brands of bottled water are essentially bottled tap water
- Bottled water cost between \$0.25 and \$2 per bottle, while tap water costs less than \$0.01 per gallon
- An 8-oz glass of water can be refilled approximately 15,000 times for the same price as a six pack of soda

Environmental

- Drinking tap water eliminates GHG emissions, air pollution and fossil fuel consumption required for the transportation of bottled water
- Encourage re-usable bottles to reduce the impact of water transport, packaging, and waste generation

Promote the Economic Advantages of Cincinnati's Water Supply

As can be seen in the charts below, Cincinnati has some of the lowest water costs in the region and country. .

Quarterly Water Costs for the Avg. Single-Family House	
City/County	Water Utility/Cost for 25 CCF
Warren County	\$64.52
Cincinnati	\$68.83
Louisville	\$74.08
Dayton	\$76.20
Hamilton County	\$86.04
Columbus	\$86.16
Cleveland	\$92.52
Indianapolis	\$96.87

Quarterly Water Costs for the Avg. Single-Family House	
City	Water Utility/Cost
Cincinnati, OH	\$68.83
Chicago, IL	\$72.36
Miami Beach, FL	\$94.92
Phoenix, AZ	\$102.87
Houston, TX	\$133.50
Austin, TX	\$185.01
Boston, MA	\$196.41

Lexington	\$126.08		
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Sources: <http://www.cincinnati-oh.gov/water/linkservid/0B08C5A2-DD35-DA9A-8EC3765E789F1EC3/showMeta/0/http://waterwebster.org/WaterRates.htm>

Educate public about the improved water quality of our local rivers and streams

Encourage recreational use of the Ohio River

MSD and its partners, the Ohio River Valley Water Sanitation Commission (ORSANCO) and Sanitation District No. 1 of Northern Kentucky (SD1), developed a new website and free wireless device app as a public service initiative to help recreational users make informed decisions about where and when to recreate on the Ohio River. The tool focuses on water quality (E. coli counts based on a predictive model), but also provides information on river stage, river velocity and weather. The tool also shows real-time marine traffic, fish advisories, Doppler radar, the locations of marinas and boat ramps, and emergency alerts/announcements, among other information.

Protect our Water Supplies

- Partner with GCWW, MSD and Cincinnati Police to hold Prescription Drug Take Back Day in coordination with national take back event/day
- Educate residents about how to properly dispose of expired or unused prescription medication - Don't flush prescription drugs down the toilet. Mix with kitty litter or coffee grounds and place in the trash unless a pharmaceutical take back program is available. That is the best alternative.
- Educate residents to select less-toxic or non-toxic substitutes if possible.
- Do not pour unwanted household chemicals down the drain or on the ground. Take them to hazardous-waste collection centers.
- Use low-phosphate or phosphate-free detergents.
- Use water-based products whenever possible.
- Dispose of excess pesticides at hazardous-waste collection centers.

Are there other positive impacts of this recommendation?

Who will be targeted for this recommendation?

All residents of the Cincinnati community will be targeted to drink more water.

Who are potential key partners for this recommendation?

- Greater Cincinnati Water Works
- Doctors to promote water to the community
- Health and education based community groups and organizations
- Schools to promote water (health, gym classes, etc.)

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can work with Greater Cincinnati Water Works to create a campaign to drink more tap water. Make sure water fountains are available and plentiful.

Is it feasible?

Potential obstacles to this recommendation include:

- Status with bottled water brands
- Billion dollar marketing and advertising campaigns by national beverage companies
- The widely-held and mistaken, perception that tap water is not as pure as bottled water

How much would it cost?

- Advertising and marketing
- Educational outreach to the public and to schools
- Staffing

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): Develop campaign with GCWW to promote drinking tap water.

Short-Term, Mid-Term and Long-Term (One to Six Years): Use public relations to promote GCWW campaign for drinking water.

Green Cincinnati Plan – Water Recommendation Smart Water Management

What is it and why is it important to the City of Cincinnati?

This recommendation focuses on the efficient use of water. The total amount of freshwater that is used to produce the goods and services consumed by residents, businesses and the community includes:

- water consumed by residents for washing, drinking, and cooking, etc.
- water used in commercial businesses to produce food, clothing, energy, construction, etc.
- water used in community services for irrigating gardens, fire fighting, pools, recreational facilities, street cleaning, etc.

For the City of Cincinnati, one of the largest uses of energy by the government is the water system. For this reason, it is important for the City to develop and implement strategies that can help to reduce this energy cost related to the water system. The recommendations can result in effective usage of a high quality resource and cost savings for Cincinnati and its residents.

Examples of Strategies for Efficient Water Use:

Education and Awareness

- Encourage sustainable consumer choices and wise use of water through customer education.
- Repair leaking pipes and dripping fixtures because a one-drop-per-second leak will amount to over 2000 gallons of water waste per year,
- Monitor water meter and/or bill for unusual increases. This may signal a leaking pipe or faucet

Indoor Use

- Use faucet aerators to reduce water use in sinks/lavatories
- Check toilets for leaks and replace leaking toilets
- Insulate water pipes. It's easy and inexpensive to insulate water pipes with pre-slit foam pipe insulation. Insulated pipes provide hot water faster and avoid wasting water while it heats up.
- Minimize use of kitchen sink garbage disposal units and start a compost pile instead. In-sink 'garburators' require lots of water to operate properly, and also add considerably to the volume of solids in the sewer pipes which can lead to maintenance problems.
- Identify and upgrade outdated/inefficient plumbing and water fixtures –by replacing old toilets with dual-flush or other High Efficiency Toilets (HET), using no more than 1.3 gallons per flush.
- Use leak detection to reduce unnecessary water use.
- Encourage government agencies that receive free water to utilize efficient equipment and techniques to control waste.

Outdoor Use

- Best Management Practices such as sweeping to clean rather than washing dirt down the drain, collecting rainwater to irrigate plants, etc.
- Select plants from locally developed lists of native plants or plant drought-resistant lawns, shrubs and plants
- Water lawns and landscape plants early in the morning when the sun's rays aren't working to evaporate the water.
- Adjust the height of lawnmowers to cut grass higher. This helps protect roots from heat stress and reduces the loss of moisture to evaporation
- Aerate clay soils at least once a year to help the soil absorb and retain moisture
- Soak, don't spray. When watering let water soak into the ground surrounding plants, trees, shrubs and flowers. Install drip-irrigation or soaker hoses for more efficient watering in planting beds and beneath shrubs and trees.
- Landscape plans should group together plants with similar water requirements
- Don't run the hose during car washing. Clean the car using a pail of soapy water. Use the hose only for rinsing - this simple practice can save as much as 150 gallons when washing a car. Use a spray nozzle when rinsing for more efficient use of water.
- Consider reducing turf areas, which generally require more water than beds of well-adapted plants, and replenish mulch around plants and trees in the Spring and Fall

Source: <http://frontierassoc.net/greenaffordablehousing/FactSheets/GAHCfactsheets/27%20water%20conservation%20final.pdf>

- Partner with MSD to educate residents and businesses about rain harvesting, the proper techniques and city requirements
- Partner with MSD to create program that distributes and tracks use of rain barrels and water data
- Offer rain barrel coupon – purchase rain barrel from MSD receive \$5.00 off purchase of rain barrel
- Partner with MSD and other community partners to establish a rain barrel educational outreach program with local schools to teach children about water cycle and rain harvesting

Are there other positive impacts of this recommendation?

- Efficient Water Usage
- Public awareness and education
- Save money
- Energy Efficiency
- Stormwater management through rainwater collected

Who will be targeted for this recommendation?

All City of Cincinnati businesses and residents are targets for this recommendation.

Who are potential key partners for this recommendation?

GCWW, MSD, local neighborhood councils, city government employees

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati can take a lead role by partnering with key departments in implementing this recommendation and making an effort to communicate best practices in water usage and efficiency to all its facilities and service providers.

The City of Cincinnati should lead by example in effective water usage. Leading by example will help encourage residents and businesses to follow these same best practices and measures. When the City promotes these best practices and is able to show tangible evidence of the benefits from engaging in these practices, this will be even more convincing to residents and businesses.

Is it feasible?

Potential obstacles to this recommendation include:

- Ensuring all employees engage in smart water management practices
- Consistent tracking of progress and successfulness
- Cost to update some of water systems

How much would it cost?

Cost for staffing and promotional materials

Effective water usage will likely provide possible unintended impacts?

- Less revenue for GCWW because of more efficient usage
- Less utilization of GCWW infrastructure for water production and distribution

Timeline for Implementation

Short-Term (One to Two Years): Best management practices for efficient water usage of city facilities. Establishment of rain water harvesting educational outreach program

Mid-Term (Three to Four Years): *Water* Consider hosting website and providing technical advice on efficient water usage for residential and commercial users

Short-Term, Mid-Term and Long-Term (One to Six Years): Lead by example by having all City facilities engage in smart water management best practices described in chapter. Work with GCWW to promote smart water management best practices identified in recommendation to the larger community.

Green Cincinnati Plan – Outdoor Recreation and Nature Awareness Recommendation Use Existing Resources Better through Assessment, Marketing, Coordination

What is it and why is it important to the City of Cincinnati?

More recreation is a way to make our city more sustainable by increasing activity and creating healthy lifestyles. Outdoor recreation may also help serve a transportation function and reduce the number of trips taken by car. Getting people outside has other positive impacts including a greater appreciation for open space, plants, and animals.

Recreation facilities are provided by a number of different departments throughout the City of Cincinnati such as the Cincinnati Recreation Center (CRC), Cincinnati Park Board, Hamilton County Park District, and the Department of Transportation and Engineering (DOTE). This recommendation focuses on ensuring residents are aware of these resources and that the City is helping to adequately market these assets in a coordinated fashion.

Examples of Existing Resources

Cincinnati Recreation Commission (CRC)

The assortment of CRC recreation facilities throughout the City of Cincinnati provides many benefits to help increase the quality of life for residents. Most of CRC's programming is targeted towards active recreation, both indoors and outdoors. The activities are also diverse in an effort to reach all Cincinnatians, including seniors and persons with disabilities. Available activities include swimming at CRC pools, athletics at CRC's over 200 ball fields, six sand volleyball courts, 125 tennis courts, 90 basketball courts and indoor activities at the 26 recreation centers. CRC also maintains more than 100 playgrounds for more unstructured play and even operates six golf courses.

Source: <http://www.cincinnati-oh.gov/recreation/linkservid/3F0B56C4-2FC9-49DF-A81124195EF25252/showMeta/0/>

Cincinnati Parks

Cincinnati has five regional and 70 neighborhood parks, as well as 34 nature preserves. Cincinnati Parks maintains parkways and neighborhood gateways in addition to managing Cincinnati's Street Tree program on 1,000 miles of city streets. The Cincinnati Parks operates five nature centers, an arboretum, and one of the largest public plant conservatories in the country. In total, Cincinnati Parks manages more than 10 percent of city land. Cincinnati Parks hosts several educational programs to help educate residents and encourage interaction with nature. Another resource available to residents through Cincinnati Parks is maps of hiking trails throughout the park system. Source:

<http://cincinnatiiparks.com/>

Hamilton County Park District

Hamilton County Park District manages numerous public parks throughout the county, all listed on its website. Many residents are unaware of how the park system helps the local community and what opportunities there are to take advantage of at these park locations. Not only are these parks essential to nature awareness and preservation in the Cincinnati area, but they also serve as gathering places for residents to enjoy the outdoors and engage

in outdoor recreation. Below is a chart with brief descriptions of some of the numerous other resources parks provide to the community in which they're located:

Hamilton County Parks Offerings & Description	
Calendar	Events, Programs, Hikes
Conservation	Habitats, Plants, Animals, Non-Native Species, Green Initiatives
Recreation	Bicycling, Athletics, Bow Hunting, Camping, Frisbee Golf, Equestrian, Fishing, Golf, Lawn Bowling, Paddling, Trails, Walk Club, Winter Sports
Education	Adventure Outpost, Backpacking, Day Camp, Highfield Discovery Garden, Parky's Farm, Organized Groups, University of the Great Outdoors, Visitor Centers, Wildflowers
Resident Involvement	Hamilton County Parks Foundation, Job Opportunities, Volunteer Opportunities

Source: http://www.neonaturalist.com/parks/hamilton_park_district.html

DOT E

The Planning and Urban Design Division of the Department of Transportation and Engineering is responsible for development of regional and citywide transportation and urban design plans and policies. A key outdoor activity related to this function is biking. As a result of the City's Bike Plan, more shared paths, bike lanes, and wide shoulders are being constructed. These facilities can promote outdoor recreation, such as biking, and link citizens to other outdoor activities

Source: <http://www.cincinnati-oh.gov/dote/about-transportation-engineering/>

Other Resources

In addition to City facilities, an outstanding number of recreation resources are managed by non-profits and other entities within the city. From large providers such as the YMCA to smaller neighborhood resources such as Price Hill's Imago, the City is filled with outdoor recreation assets. Water based outdoor recreational activities including paddling and fishing are also growing in popularity. Events such as Paddlefest and the Mill Creek Yacht Club can be linked to the Water and Land Management chapters of this plan.

Who will be the targets for this recommendation?

All residents living in the City of Cincinnati will be targeted through this recommendation.

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can work with each organization identified in the recommendation to assess the use of the resources provided by that organization. After this assessment, the amount of marketing necessary for each organization's resources can be better determined.

Is it feasible?

Some potential obstacles to achieving this recommendation include:

- Developing a uniform method to assess current use and potential use of resources
- Consistency and how often assessments will be conducted
- Ensuring organizations keep data as records so it can be compared each year to plan for improvements and calculate usage of facilities and resources
- Organizing a one-stop shop for residents when there are multiple providers
- Due to depth and diversity of these assets, there may be an awareness gap and challenges in marketing these resources as a whole

How much would it cost?

- Cost of an assessment
- Promotional materials

Are there other positive impacts?

- Increased nature and recreation awareness
- Increase physical activity of residents leading to a healthier city
- Ability to combine marketing efforts, saving organizations money and resources

Are there possible unintended impacts?

- Non-productive competition between recreational providers
- Discovery of recreational gaps that don't have funding

Timeline for Implementation

Short-Term (One to Two Years): The City can support the effort of all groups (DOTE, Parks, CRC, etc.) compiling information on events and activities going on in the parks, other outdoor areas, etc. as they try to increase coordination in awareness and marketing efforts. The City can partner with Green Umbrella (GU) to organize organizations and gather information that is pertinent to the outdoor recreation and nature awareness database.

Mid-Term (Three to Four Years): The City can support GU's efforts to organize all the information into a database and house this on the GU website for easy access by the public.

Long-Term (Five to Six Years): The City can take a lead role by encouraging all employees to access and use the GU website. This could be part of a health initiative.

Short-Term, Mid-Term and Long-Term: The City can support the organizations mentioned in this recommendation, along with other outdoor recreation and nature awareness organizations, in their efforts to strengthen partnerships and build cooperation between all of the groups involved.

The City can partner with outdoor and recreation organizations (Parks, CRC, DOTE, schools) in efforts to change attitudes and habits so residents look to do more outdoor activities and engage in nature.

Green Cincinnati Plan – Outdoor Recreation and Nature Awareness Recommendation

Support Events like Kids Outdoor Adventure Expo

What is it and why is it important to the City of Cincinnati?

In order to increase people's awareness to take advantage of the many outdoor recreational and nature education opportunities available in the Cincinnati region, this recommendation focuses specifically on the awareness of children. Families with children should be of key interest. Exposure to nature at an early age can lead to a lifelong appreciation of the outdoors.

In order to reach this target audience and engage children in outdoor recreational and nature awareness activities, this recommendation focuses on the strategy of the City of Cincinnati hosting or promoting events such as Kids Outdoor Adventure Expo each year. This recommendation is important because by targeting families to attend these events focused on outdoor and nature activities, this will help encourage and engage the families, and especially the children, to try to incorporate these activities into their daily lives.

Examples of Outdoor Events

Kids Outdoor Adventure Expo

The Kids Outdoor Adventure Expo (Kids Expo) is part of Paddlefest, an annual event where over 2,000 paddlers take to the Ohio River. At Kids Expo 2012, children toured a working tow boat and learned about life and jobs on the river. In addition, they learned about great outdoor activities like sustainable gardening, how to bait a hook and catch a fish, bird watching, riding a bike in the first Kids Expo bike rodeo, and learning basic bike repair. Every child also learned about water safety, how to act in and around water, how to safely paddle in water, and the proper way to wear a life jacket.

Great Outdoor Weekend (GOW)

GOW, an initiative of Green Umbrella, is a sampling of the best outdoor recreation and nature education activities offered in the region around Greater Cincinnati. In 2012, GOW offered over 120 opportunities for adults and children alike to engage with the environment. Opportunities included learning about composting, taking a creek walk, exploring the tree tops or archery. All programs at the event, which occurs every September, are free and open to the public.

Five Rivers Metro Parks Adventure Summit

The adventure summit is the Greater Dayton area's premier outdoor adventure exposition. Every other year, thousands of outdoor enthusiasts converge on Dayton, Ohio, The Outdoor Adventure Capital of the Midwest, for a weekend of outdoor skill, culture, and experience.

Midwest Outdoor Experience

Midwest Outdoor Experience (formerly GearFest) has grown beyond just gear and exploded into a multi-day event, featuring outdoor activities, exhibitor village, competitions, music, craft beer garden and food, camping, and exciting demos. Midwest Outdoor Experience offers something for the budding weekend warrior to the hardcore

outdoor enthusiast. With over 15,000 visitors during the 2012 event, Midwest Outdoor Experience is one of the largest festivals celebrating the outdoor lifestyle in the Midwest.

Nature Next Door Program

This program is offered by the Cincinnati Parks Department as an eight-week series at local parks. It's a free, inner-city [summer camp](#) that provides outdoor activities for children in one-and-a-half-hour sessions. Nature Next Door brings science and nature education to children in some of our city's most at-risk neighborhoods. Each summer the Nature Next Door program provides hands-on lessons on wildlife, fossils, insects, and more to over 3,600 inner city children.

Additional Resource

No Child Left Inside

No Child Left Inside is a non-profit organization that works for nature and outdoor recreation awareness for families and children. There is information for parents, mentors and teachers on strategies for promoting nature and the outdoors to children. This is a strong resource for information and activities going on in the Cincinnati region to connect children with nature and the outdoors. Source: <http://lncigc.org/>

Who will be the targets for this recommendation?

All residents living in the City of Cincinnati with children

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can take a lead role in organizing and promoting programs such as Kids Outdoor Adventure Expo through their different entities such as Hamilton County Parks, Cincinnati Recreation Commission, and Cincinnati Parks.

The City of Cincinnati can also work with local outdoor recreation or nature awareness groups such as the Cincinnati Cycle Club, the Outdoor Mindset Group, 45069 Club and Beyond, Cincinnati Backpackers Meetup, Cincinnati Run Club, and more listed on the following website of outdoor recreation meet-up [website](#):. By partnering these groups, the City of Cincinnati can leverage and help promote these already existing organizations to help create smaller versions of Kids Outdoor Adventure Expo to educate and encourage children to participate in specific outdoor and recreation activities.

Is it feasible?

Some potential obstacles to achieving this recommendation include:

- Organizations may not want to spend time and resources on children since most members are adults

How much would it cost?

- Educational materials at events
- Publicity for events
- Sponsors for events

Are there other positive impacts?

- Increased nature and recreation awareness especially among children and families

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): The City can support these events and the organizations involved to develop plans to expand and market the events in the future.

The City can support the incorporation of more outdoor and nature related events in cooperation with organizations such as Parks, Green Umbrella, etc. at the Earth Day event at Sawyer Point.

Mid-Term (Three to Four Years): The City can support the creation of new outdoor recreation and nature awareness events for children such as a Green Umbrella supported Outdoor Kids Expo for winter and quarterly events, possibly at the local parks, to help children learn about the changing seasons in the area.

Short-Term, Mid-Term and Long-Term: The City can partner with the Parks, Green Umbrella, schools, etc. to participate in more marketing of these events for children in order to increase the reputation of the events and to gain resources and partnerships from local corporations and organizations.

Green Cincinnati Plan – Outdoor Recreation and Nature Awareness Recommendation Link Natural Areas to the Urban Population

What is it and why is it important to the City of Cincinnati?

In an effort to increase outdoor recreation and nature awareness, this recommendation focuses on strategies to link natural areas to the urban population. Often when people live in a large urban area such as Cincinnati, people tend to forget the outdoor and natural areas that are available for use right in their neighborhood or just down the road. For this reason, it is important to link and engage the urban population to these opportunities and resources to help increase awareness and utilization of the resources.

Strategies to Link Natural Areas to the Urban Population

Transit

Often large parks and natural areas are not within walking distance. Metro can incorporate linking parks and natural areas in its future public transit planning. By ensuring adequate public transit to these areas, all residents will have the ability to get to and enjoy these resources.

Biking

The Little Miami Bike Trail and other local bike trails also serves as transportation connections which have the potential to be further developed to interconnect with other bike trails and incorporate more parks and outdoor areas along the routes.

Urban Wilderness Loop – Knoxville Example

Only two miles from downtown, Knoxville's Urban Wilderness presents a unique urban playground for hikers, mountain bikers, and trail runners. The first phase of the Urban Wilderness project is the newly opened South Loop Trail — thirty-five miles of natural surface trails connecting five parks and natural areas along with public and private lands creating an unparalleled outdoor venue. The 11.5 mile trail connects Ijams Nature Center, Forks of the River Wildlife Management Area, William Hastie Natural Area, and Marie Myers Park with trailheads and parking along the route. The South Loop offers easy to moderate trails for all users and the additional 24 miles of secondary trails accommodate users from beginner to advanced on dozens of trails of varying terrain.

A similar trail could be a creative option for the City of Cincinnati to link a number of its parks and natural areas in an effort to interconnect as many of these resources as possible to make them easily accessible and convenient for residents as possible.

Cincinnati Mill Creek Greenway Trail

The planned 13.5-mile City of Cincinnati Mill Creek Greenway Trail will serve as a multi-purpose trail that will connect with existing streets, on-road bike lanes, Metro and Access bus stops, and pedestrian sidewalks. In addition, the trail will link parts of five residential neighborhoods, two business districts, Salway Park, and the Spring Grove Cemetery. The multi-objective Mill Creek Greenway Trail will feature green technology and eco-friendly construction methods, including use of porous and other green paving materials such as rubber from shredded tires for the trail and parking lots, and trail furnishings from reused

or recycled materials. This trail system can be incorporated into and use as a small scale example of the larger trail system this recommendation proposes.

Source: <http://www.cincinnati-oh.gov/bikes/bike-infrastructure/trails/>

Who will be the targets for this recommendation?

- Residents of the City of Cincinnati
- Transportation resources – City of Cincinnati Department of Transportation and Engineering, Metro
- Hamilton County Park District

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati needs to partner with transit, park, natural area, and other organizations to help implement the strategies in this recommendation. Input from all these organizations is needed to identify to what degree this recommendation is feasible in the Cincinnati region. The City can take a lead role in trying to organize a meeting between the different organizations to formulate a plan and identify the cost structure and resources available for the plan.

Is it feasible?

Some obstacles to achieving this recommendation include:

- Space needed to interconnect natural areas and parks to the urban population
- Increasing interest in outdoors and nature to the urban population
 - Sometimes there are cultural differences that make structural recreation such as team sports a priority over more passive interactions with nature

How much would it cost?

- Transit routes
- Promotion, events

Are there other positive impacts?

- Increased physical activity of residents outdoors
- Nature awareness
- More people outside helps create a cleaner, safer city where residents take more pride and ownership of the outdoors in their area

Are there possible unintended impacts?

- Taking resources away from other priorities (transit to jobs?)

Timeline for Implementation

Short-Term (One to Two Years): The City can partner with Parks, DOTE, local bike trails, etc. to collect data on locations of all the trails that should be included in trail system and on the map.

The City can partner with Parks, DOTE, local bike trails, etc. in increasing promotion of the increased connectivity of the urban areas and natural areas because many people are unaware of the linkage. A kick-off event for the trail system could help spread the word.

The City can partner with Mill Creek Watershed Council of Communities and MSD to designate the Mill Creek as a water trail with ODNR recognition.

Short-Term, Mid-Term and Long-Term: The City can support Metro to ensure proper transit routes are available for easy accessibility to outdoor recreation sites.

Green Cincinnati Plan – Outdoor Recreation and Nature Awareness Recommendation Establish Mentoring Programs

What is it and why is it important to the City of Cincinnati?

Fostering and growing a passion and appreciation for outdoor recreation and nature at a young age is a strategy that can lead to a lifelong appreciation for the natural environment. This recommendation focuses on how mentoring programs can help connect outdoor and nature enthusiasts with others who are interested in learning more about taking advantage of the outdoor recreation and nature resources available throughout the City of Cincinnati.

Examples of Mentoring Programs

- **Outdoor Nation**

Outdoor Nation (ON) is a non-profit focused on promoting nature and outdoor adventure. ON hosts summits around the country, award grants for outstanding project ideas, leads outdoor outings, works with youth, and connects with others with a similar mission, all in an effort to mobilize a movement to get the next generation outside. Some of the mentoring programs ON supports through its grants are:

- **Reach One Teach One**

Peer to peer mentoring is one of the most effective ways to introduce the outdoors to young people. Reach One Teach One works with several schools in New York, on a pilot basis, to have young reliable college-age mentors address students to promote and organize outdoor activities and opportunities with local organizations. This awareness leads to student outdoor appreciation and ultimately advocacy of outdoor activities during the school day.

- **Nature’s Big Brothers & Big Sisters**

Engaging community partner organizations is a top strategy for Outdoor Nation. By leveraging the existing infrastructure, Nature’s Big Brothers and Big Sisters recruits/trains high school students by using existing FamComp resources (program in California). This training teaches the young leaders of Big Brothers and Big Sisters to be safe outdoor leaders and positive mentors. Once trained, these leaders can plan and implement monthly outdoor activities and service projects with their ‘little ones.’

The City of Cincinnati can use these examples as models for how to set up or incorporate nature awareness and outdoor recreation mentoring programs within the region. There are numerous organizations throughout Cincinnati promoting outdoor recreation and nature awareness. These organizations can all incorporate mentoring programs to help increase participants and promote the value of the outdoor recreation or nature activity the organization supports.

If the City of Cincinnati did want to form an entirely new program to help promote outdoor recreation and nature awareness, the program replication guide from the Outdoor Explorers Mentoring Program could be used as a guide for how to build a similar program in the Cincinnati area.

Program Replication Guide:

http://www.wilderness.net/toolboxes/documents/education/OEMP_Replication_Guide.pdf

Existing Mentoring Programs in Greater Cincinnati that could incorporate an outdoor element to their program include:

- YMCA and Cincinnati Youth Collaborative (CYC) mentoring
http://www.cycyouth.org/cyc-pages.php?page_id=28
- Big Brothers Big Sisters
http://www.bigsforkids.org/site/c.buIUJgNUKjL6G/b.6412363/k.EF05/Home_Page.htm
- UC Zoo-Mates
<http://www.uc.edu/cce/student/Zoo-Mates.html>
- Cincinnati Youth Collaborative Business mentors Partnership
http://www.cycyouth.org/cyc-pages.php?page_id=146
- Cincinnati Nature Center
<http://www.cincynature.org/youth-programs.html>

Other programs that might offer a potential pool of mentors:

- Cincinnati Museum Center Youth Program
<http://www.cmcyouthprograms.org/home>
- Giveback Cincinnati and other YP organizations
http://www.givebackcincinnati.org/v3/events_details.asp?EventID=1459
- Sierra Club Inner City Outings
<http://miami.ohiosierraclub.org/inner-city-outings/>
- High School Students (who have volunteer requirements – “service learning”)
- NKU Leadership Institute
<http://nkuonline.nku.edu/smartcatalog/freshman-service-leadership-committee.htm>
- Boy & Girl Scouts
<http://www.danbeard.org/>
<http://www.girlscoutsofwesternohio.org/Pages/default.aspx>

Who will be the targets for this recommendation?

- Residents interested in the outdoors and recreation
- Current mentoring programs in place that may want to incorporate nature and outdoors into their mentoring program focus
- Cincinnati Public Schools
- Outdoor recreation/nature organizations (biking, kayaking, hiking groups, etc.)

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can partner with the different organizations mentioned in this recommendation to discuss the feasibility of incorporating mentoring on outdoor recreation and awareness topics into the current mentoring program or the organizations current dynamics if there is not an existing mentoring program. By using groups already providing mentoring support or already prompting a mission related to outdoor recreation and nature awareness, this will help cut costs and time needed to develop a completely new program to fulfill the recommendation.

Is it feasible?

Some potential obstacles to achieving this recommendation include:

- Finding people willing to be mentors and people wanting to be mentored

How much would it cost?

- Funding for a mentoring program (not just a one-time cost)
- Promotion of the mentoring program

Are there other positive impacts?

- Connecting residents in the Cincinnati region
- Increased outdoor recreation and nature awareness
- Increased network and resource for people interested in outdoors/nature

Are there possible unintended impacts?

- Stretching existing mentoring organizations away from their core missions

Timeline for Implementation

Short-Term (One to Two Years): The City can partner with the Green Umbrella's Meet Me Outdoors Action Team to determine which mentoring programs are best to target. After the list is assembled, the Action Team can help bring ideas to these mentoring programs about how to incorporate outdoor and nature awareness into their existing program.

The City can support outdoor or nature programs, such as the ones mentioned in this recommendation, in efforts to partner with mentoring programs or for these outdoor and nature awareness organizations to start their own mentoring program.

Mid-Term (Three to Four Years): The City can partner with Green Umbrella Meet Me Outdoors Action Team to help match volunteers with a new mentoring program.

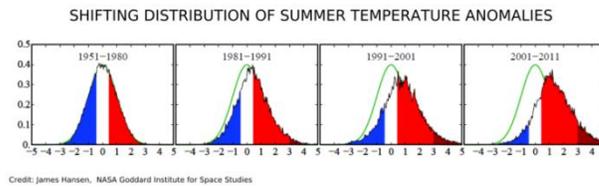
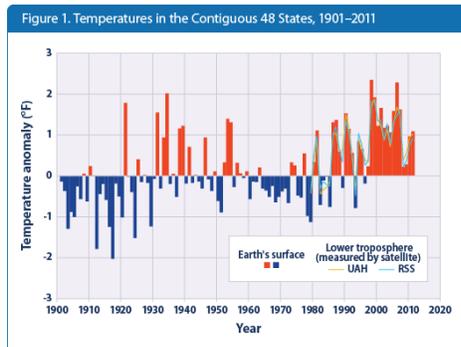
Short-Term, Mid-Term and Long-Term: The City can help partner with CPS, etc. to identify and target more children to participate in these mentoring programs related to outdoor recreation and nature awareness.

The City can support the efforts of schools, mentoring programs, nature programs, and outdoor recreation programs to build stronger relationships and coordinate more with each other.

Green Cincinnati Plan – Climate Change Recommendation Dealing with Prolonged Heat

What is it and why is it important to the City of Cincinnati?

Research suggests Cincinnati could experience a significant shift in climate in the future. Cincinnati has already experienced increasing periods of prolonged heat in the summer and mild weather in winter. Average U.S. temperatures are projected to rise 7^oF to 11^oF by the end of the century under a high carbon-emissions scenario and 4^oF to 6.5^oF under a low carbon-emissions scenario. The 2000 to 2010 decade was the hottest on record so far. The two charts below show statistical data showing the increase in temperatures across the U.S., emphasizing the need to establish a plan to deal with these changes and the effects it will have on the City’s residents and environment.



This recommendation focuses on strategies to prepare Cincinnati and its residents for the inevitable impacts of climate change, including times of prolonged heat. There are actions described in this recommendation to reduce the risk of prolonged heat; and strategies to more effectively deal with the prolonged heat when it occurs.

Sources:

- http://upload.wikimedia.org/wikipedia/commons/thumb/8/88/Shifting_Distribution_of_Summer_Temperature_Anomalies2.png/800px-Shifting_Distribution_of_Summer_Temperature_Anomalies2.png
- <http://www.epa.gov/hiri/resources/pdf/HIRIbrochure.pdf>

Specific problems associated with prolonged heat:

- Illness and physical affects including: heat edema, heat rashes, heat cramps, heat exhaustion, heat syncope, heat stroke, hyperpyrexia
- Increase in projected deaths in Cincinnati each year from extreme summertime heat according to Heat in the Heartland:

Years:	2020-2029	2045-2055	2090-2099
Number of Projected Deaths Each Year:	19	23	31

- Negative effect on ecosystems if plants and animals cannot adapt
- Average nighttime temperature increases mean homes will cool more slowly during the night, resulting in people getting less relief from heat at night

Strategies to deal with prolonged heat:

- Communicate danger of prolonged heat by ensuring real time public access to information on the risks and appropriate responses through broadcast media, websites and toll-free phone lines

- Set up 24-hour cooling centers throughout the city to respond to human needs during extreme heat and communicate to residents the importance of going to these centers if they do not have air conditioning in their homes
- Conducting police checks of senior citizens and at-risk individuals
- Inspection of high-risk buildings to ensure windows and ventilation systems are properly working
- Establish a system to alert public health officials about those in distress
- Continue Cincinnati Health Department's monitoring system of daily weather forecasts for the timely issuing of heat alerts and heat emergencies for the city
- Continue Cincinnati Drug and Poison Control's system for issuing special health alerts during times of prolonged heat
- Monitoring on utility shut-offs
- Preparation for power failures during heat emergencies
- Preparation for spikes in power demand

Are there other positive impacts of this recommendation?

- Better health for citizens
- Community outreach on the impacts of climate change

Who will be targeted for this recommendation?

Vulnerable populations: elderly, poor, ill, etc.

Who are potential key partners for this recommendation?

Cincinnati Health Department, National Weather Service (issues heat watches), Cincinnati Drug and Poison Information Center, local recreation centers (cooling center locations), Cincinnati Police Department, Duke Energy

How can the City of Cincinnati influence the initiation of these programs?

The City of Cincinnati can implement strategies to deal with prolonged heat. The City needs to consistently communicate with residents during times of prolonged heat to ensure all people are aware of the situation when prolonged heat is going to occur and that people are educated about how to handle the situation to stay safe and cool. The City can lead emergency planning efforts.

Is it feasible?

Potential obstacles to this recommendation include:

- Timely communication with residents
- Ensuring all at-risk residents are safe

How much would it cost?

- Education and promotion on how to handle prolonged heat
- Increased staff during prolonged heat to carry out the strategies described in this recommendation (toll-free phones, door-to-door checks, building checks)
- Increased electric generating capacity or programs to shed non-critical loads

Are there possible unintended impacts?

- Panic among residents when heat advisories and emergencies are announced
- People ignore the advisories and do not take appropriate action

Timeline for Implementation

Short-Term (One to Two Years): Review City’s Emergency Plan and incorporate language for heat emergencies.

Mid-Term (Three to Four Years): Include resources in budget to implement recommendations in Emergency Plan.

Short-Term, Mid-Term and Long-Term (One to Six Years): The City can partner with Cincinnati Health Department, National Weather Service (issues heat watches), Cincinnati Drug and Poison Information Center, local recreation centers (for cooling center locations), Cincinnati Police Department, and Duke Energy to make residents aware of heat situation, what strategies to take to deal with heat and where to go.

Overall Sources:

- Heat in the Heartland: 60 Years of Warming in the Midwest. Published in July 2012 by the Union of Concerned Scientists.
- Chicago Climate Action Plan, Strategy 5: Adaption
 - www.chicagoclimateaction.org
- Local Governments, Extreme Weather, and Climate Change 2012. Published in 2012 by ICLEI–Local Governments for Sustainability USA
 - <http://www.iclei.org/>

Green Cincinnati Plan – Climate Change Recommendation Changes in Growing Zone

What is it and why is it important to the City of Cincinnati?

Hardiness or growing zones are geographically defined areas in which a category of plant life is capable of growing, as defined by climatic conditions, including its ability to withstand the minimum temperatures of the zone.

As the world's climate continues to change, so could the native ecosystems within our region. If left unchecked, climate changes would make the region's plant hardiness zone similar to that of northern Alabama by the end of the century. Even if the GHG emissions are dramatically reduced, our plant hardiness zone could look similar to that of southern Missouri. Tree species such as maples and white oaks will disappear. Native birds and animals will have trouble adapting to our new climate. Some will not survive, while others will migrate to more hospitable climates if possible. New plants can cause additional allergies to humans and insect pests can cause disease among the plant population. The purpose of this recommendation is to prepare Cincinnati's natural environment for climate impacts and maintain biodiversity.

Strategies to deal with changes in the growing zone:

To prepare for changes in Cincinnati's growing zone, the City can partner with nurseries, developers and other stakeholders. Together they can work to amend the landscape ordinance to better accommodate plants that can tolerate the altered climate. The City and its partners can also work to publish a new plant-growing list, focusing on plants that can thrive in warmer conditions. Farmers, gardeners and nurseries, etc. may need to make changes to when they plant certain plants and when certain crops or plants should be picked, which could be included in this resource.

In addition to climate change trends, it is also important to evaluate the soil moisture, humidity, the number of days of frost, and the risk of a rare catastrophic cold snap in the region. All of these factors have an effect on a changing growing zone and whether certain plant species can successfully grow in this region's conditions.

Are there other positive impacts of this recommendation?

- Farmers/gardeners may be able to grow new crops that could never grow here previously
- More emphasis on protecting biodiversity

What will be the target for this recommendation?

Landscapes, land managers, park districts, horticulturists, landscape architects, gardeners and farmers

Who are potential key partners for this recommendation?

Nurseries, developers, urban planners, Cincinnati Zoo and Botanical Gardens, Krohn Conservatory, Hamilton County Park District, City Park Board, Civic Garden Center

How can the City of Cincinnati influence the initiation of this recommendation?

- Plant appropriate trees
- Update landscape ordinances and recommended lists
- Lead or participate in tree planting campaigns

Is it feasible?

Potential obstacles to this recommendation include:

- Finding new plants that can survive in our climate
- Dealing with disruption of ecosystems as plants and animals die off
- Consistent data management for research on climate changes, etc.
- Capacity building to deal with changing growing zones
- Changing landscape ordinances

How much would it cost?

- Education and promotion to residents, nurseries, etc. on what plants to use
- Monitoring which plants are most successful as temperatures rise

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): The City can plant appropriate trees and change recommended plant species in landscape ordinance.

Short-Term, Mid-Term and Long-Term (One to Six Years): Support nurseries, developers, urban planners, Cincinnati Zoo and Botanical Gardens, Krohn Conservatory, Hamilton County Park District, City Park Board, Civic Garden Center on educating and promoting correct plants.

Overall Sources:

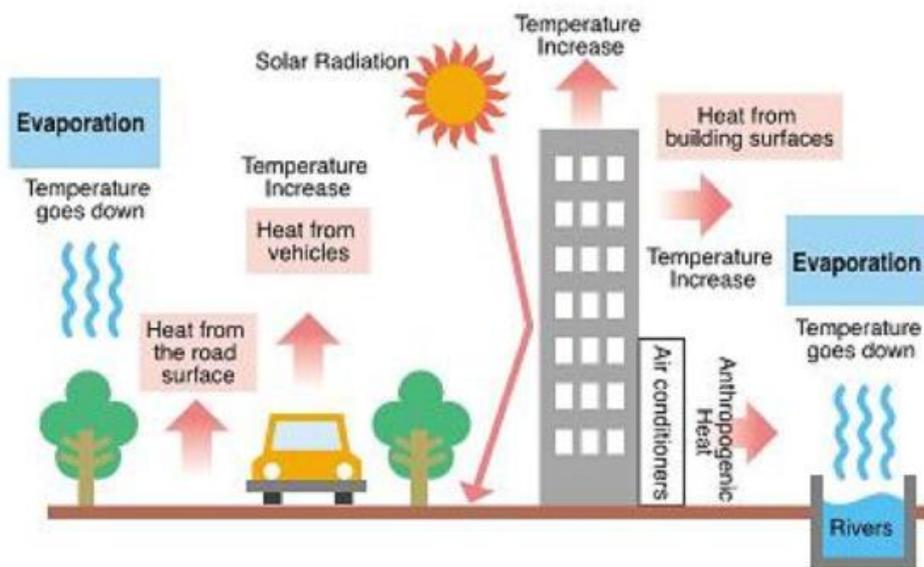
- http://en.wikipedia.org/wiki/Hardiness_zone
- <http://www.rockefellerfoundation.org/uploads/files/9eacd477-e2ef-4b72-9207-5a18135dceb3.pdf>
- Chicago Climate Action Plan, Strategy 5: Adaption
 - www.chicagoclimateaction.org

Green Cincinnati Plan – Climate Change Recommendation Mitigating Urban Heat Islands

What is it and why is it important to the City of Cincinnati?

According to the U.S. EPA, temperatures in U.S. cities can be as much as 10°F hotter than surrounding areas. U.S. cities tend to consist of many buildings with dark surfaces and a strong presence of asphalt pavement. The buildings and the pavement absorb a significant amount of light and radiation and emit it as heat, warming the city. Scientists believe vegetation also plays a large part in keeping an area cool through the **evaporative cooling process**. **Building** a city means replacing vegetation with structures, resulting in the city losing the evaporative cooling advantages of vegetation. Other heat sources include cars and [air conditioners](#), which are ubiquitous in urban areas, convert energy to heat and release this heat into the air. Below is a diagram illustrating the urban heat island effect:

● The Urban Heat Island Effect



This recommendation focuses on reducing the urban heat island effect. The cause of urban heat islands is known; therefore, many strategies have been developed to help control it.

Specific issues caused by heat islands:

- Compromised human health and comfort
- Increased energy consumption
- Elevated emissions of air pollutants and greenhouse gases
- Impaired water quality

Source: <http://www.epa.gov/heatisd/impacts/index.htm>

Strategies to deal with urban heat islands:

- Use of cool roofs - On a hot, sunny, summer day, traditional roofing materials can reach peak temperatures of 190°F. By comparison, cool roofs, made of light colored materials, reach maximum temperatures of 120°F. Cool roofs can also lower cooling energy use, peak electricity demand, air pollution and greenhouse gas emissions, heat-related incidents, and solid waste generation due to less frequent re-roofing.
- Use of green roofs – these vegetated roofs contribute to heat island reduction by replacing heat-absorbing surfaces with plants, shrubs, and small trees that cool the air through evaporation.

- Trees and vegetation - Scientists with The Lawrence Berkeley National Laboratory's Heat Island Group estimate that planting trees and vegetation for shade can reduce a building's cooling energy consumption by up to 25 percent annually. Trees and vegetation can also reduce heating and cooling energy use and associated air pollution and greenhouse gas emissions, remove air pollutants, sequester and store carbon, help lower the risk of heat-related illnesses and deaths, improve stormwater control and water quality, reduce noise levels, create habitats, improve aesthetic qualities, and increase property values.
- Expand green spaces such as parks and rooftop gardens
- Apply high-reflectivity coatings to asphalt
- Sprinklers on the roof wet the surface so that the air around it cools through evaporation
- Tree borders can be planted around traditional parking lots. Tall trees not only contribute to evaporative cooling but also provide much-needed shade.
- Increase cool pavements which can indirectly help reduce energy consumption, air pollution, and greenhouse gas emissions. Depending on the technology used, cool pavements can improve stormwater management and water quality, increase surface durability, enhance nighttime illumination, and reduce noise.

Are there other positive impacts of this recommendation?

- Reduced energy use, lower bills for residents
- Improved air quality and lower greenhouse gas emissions
- Enhanced stormwater management and water quality
- Reduced pavement maintenance
- Improved quality of life, better health

Who will be targeted for this recommendation?

The urban area of Cincinnati will be targeted for this recommendation.

Who are potential key partners for this recommendation?

Urban planners, building owners in the city-especially downtown, residents of Cincinnati, construction companies building in the city, Park Board, Department of Transportation and Engineering (DOT&E)

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can take a lead role in this recommendation in areas such as:

- Shift toward concrete roads, adopt cool roof and pavement building standards and lead tree planting efforts
- Require cool/reflective roof standard for new construction or major renovations of City facilities
- Legislation requiring paved surfaces to be covered with "cool pavement"

Is it feasible?

Potential obstacles to this recommendation include:

- Legislation
- Enforcing policies regarding controlling urban heat island effect

How much would it cost?

- Cost to make changes to building and roads
- Cost of planting new vegetation and trees
- Employees

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): Plant street trees, promote cool/green roofs.

Mid-Term (Three to Four Years): Incorporate requirements for cool/green roofs, landscaping into zoning and subdivision regulations.

Short-Term, Mid-Term and Long-Term (One to Six Years): The City can partner with urban planners, building owners in the city-especially downtown, residents of Cincinnati, construction companies building in the city, Park Board, DOTE to implement strategies identified in recommendation such as cool roofs, expanded greenspace, green roofs, etc. throughout Cincinnati.

Overall Sources:

- <http://science.howstuffworks.com/environmental/green-science/urban-heat-island.htm>
- <http://www.epa.gov/heatisd/impacts/index.htm>

Green Cincinnati Plan – Climate Adaption Recommendation Improving Infrastructure to Withstand Stormier Weather

What is it and why is it important to the City of Cincinnati?

The Environmental Protection Agency (EPA) and NASA have both done scientific research to predict how climate change will affect patterns of precipitation and storm events. The research shows that the amount of precipitation, strength of winds and overall severity of storms and tornadoes in the area are expected to increase.

The prediction of increased severe weather presents risk to the community. Infrastructure needs to be strengthened to mitigate the impact of storms and their aftermath-such as increased flooding. This recommendation is for the City of Cincinnati to improve the infrastructure of the community-ensuring the infrastructure can sufficiently withstand weather more severe than historical weather patterns.

Sources: <http://www.epa.gov/climatechange/science/future.html>
<http://www.sciencedaily.com/releases/2007/08/070830105911.htm>

Strategies to Improve the Infrastructure:

Short-term Strategies:

- Monitor the changing environment to gain operational information about climate change in Cincinnati and its effects
- Assess the current infrastructure's ability to handle worst-case climate change scenarios to identify potential threats associated with those impacts and determine where these weaknesses overlap. For example, is there a bridge that is vulnerable to a rise in river level, flooding and severe storms?
- Conduct cost/benefit analyses to identify and prioritize the most vulnerable infrastructure for retrofit now to avert future direct and collateral damage from impacts
- Incorporate climate change considerations into current decision-making and planning. For example, when maintenance requires culvert replacement, replace old culverts with new ones that are adequate to handle more frequent/severe floods
- Relatively minor alterations to the building codes such as banning building systems (like electrical boxes, furnaces and hot water heaters) in basements

Long-term Strategies:

- Reforms to the planning, design, operation, and maintenance of transportation infrastructure. To the extent practicable, design and build infrastructure to withstand a warmer and wetter climate.
- Bridges may need to be built with larger capacities to compensate for river level rising or increased flood events
- Highways may need to be designed to reduce the volume of standing water on the travel surface associated with frequent heavy rain events
- Highways and roads along rivers or streams may need to be relocated further away from where they are presently located to compensate for rising water levels, erosion and increased flooding
- Managed retreat, in which people would cede low-lying areas to the river

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Sources:

- <http://collaborate.csc.noaa.gov/climateadaptation/Lists/Resources/DispForm.aspx?ID=459&ContentTypeld=0x010300039D262E3B99C846B963A88630C05E27>

- <http://www.nytimes.com/2012/11/04/nyregion/protecting-new-york-city-before-next-time.html?pagewanted=all&r=0>

What will be the targeted areas for this recommendation?

The targets of this recommendation are managers of infrastructure, roads, levees, etc.

Who can the City partner with to accomplish this recommendation?

DOTe, civil engineers, city planners

How can the City of Cincinnati influence the initiation of this recommendation?

The City of Cincinnati can **conduct a vulnerability assessment** that will highlight the actions needed to reduce the risk posed by climate change to community-wide systems such as transportation, drinking water and electrical systems. After this assessment is completed, the City can identify the areas of risk and implement the appropriate strategies, such as the ones identified in this recommendation, to deal with these at risk areas.

Is it feasible?

The obstacles to achieving this recommendation include:

- Funding will be a challenge
- Inability to predict severity of storms and their aftermaths
- Coordination of multiple entities with a role in infrastructure

How much would it cost?

- Construction costs for new or improved infrastructure
- Cost of running vulnerability assessment

Are there other positive impacts?

- Safer community for residents during severe weather
- Less damage means cost savings during recovery after severe weather
- Creation of jobs to improve infrastructure

Are there possible unintended impacts? No.

Timeline for Implementation

Short-Term (One to Two Years): Complete vulnerability assessment.

Mid-Term (Three to Four Years) and Long-Term (Five to Six Years): Make infrastructure investments.

Short-Term, Mid-Term and Long-Term (One to Six Years): The City can partner with DOTe, civil engineers, city planners, etc. to assess current infrastructure and identify needs for improvement, cost-benefit analysis, identify minor c