Oxford Community Climate Action Task Force Report and Recommendation

Introduction

In March 2019 Oxford City Council created a Community Climate Action Task Force to coordinate a local response to the global climate challenge by recommending if and how the City of Oxford might commit to significant greenhouse gas (GHG) reductions commensurate with the Paris Climate Accords, including by joining a commitment framework like the Global Covenant of Mayors for Climate and Energy. The task force was charged not with developing a final plan but a preliminary road map to inform future decision-making, including though upcoming comprehensive plan revisions.

The steering committee met regularly throughout the summer of 2019 to review best practices in climate action among peer communities, climate action accomplishments by the City of Oxford, and the feasibility of making a municipal and/or community climate commitment. It coordinated a "Climate Action Workshop" on June 20, 2019 to engage diverse key stakeholders and the general public.

Task Force Recommendations

Based on its analysis the steering committee of the task force recommends:

1. The City of Oxford should sign the Global Covenant of Mayors as public commitment to confront climate change, framework for integrating climate action into community planning and decision-making, and platform for measuring and reporting progress on a phased timeline:
    a. Express a political commitment by signing a Letter of Commitment
    b. Within 1 Year: Inventory community-wide GHG emissions (CO_2e from stationary sources and in-boundary travel) and identify and report hazards
    c. Within 2 Years: Set GHG emission reduction targets over a baseline year, assess climate change risks/vulnerability, and complete full inventory (other GHG gases and sectors)
    d. Within 3 Years: Develop Climate Action Plan showing implementation strategies for achieving targets and Climate Adaptation Plan for adjusting to changed climate
    e. Ongoing: Report updated emissions inventory every three years.
2. The City of Oxford should integrate climate action into upcoming comprehensive plan revision as specific focus of the request for proposals for consulting services, existing conditions research, public engagement, and development of goals and objectives. This process can assist the community in cost-effectively identifying realistic GHG reduction targets (municipal and community-wide) and develop mitigation and adaptation plans and strategies to achieve them.
3. The City of Oxford should integrate climate action with existing decision-making processes. Goals and strategies identified in the comprehensive plan should guide capital improvements planning and budgeting, operational budgeting, administration/operation, as well as regulations and decision criteria shaping private/community development. This requires collaboration across departments, guided and supported by city administration and Council.
4. Additional climate action responsibilities should be carefully balanced with other policy-making and staff priorities, and additional support provided where necessary (e.g. GHG inventory should be coordinated by particular staff, but data gathering shared across departments and perhaps supported by in-house interns). City leadership should ensure sufficient staff resources.
5. The City should collaborate with neighboring jurisdictions in community-wide climate efforts. Joint Miami-Oxford climate action is central to achieving respective operational and community goals and should engage other jurisdictions and key organizational stakeholders in a collaborative leadership structure to optimize coordination and community-wide progress.

Overview of Climate Action and the Global Covenant of Mayors

In 2018 students in Miami's Institute for Environment and Sustainability prepared a public service project "Climate Change Mitigation and Adaptation Strategies for the City of Oxford, Ohio: A Feasibility Study of the Global Covenant of Mayors for Climate and Energy" for the Environmental Commission.

According to the UN, "impacts of climate change are global in scope and unprecedented in scale" including shifting weather, flooding and rising sea levels, mass extinction and requires "drastic action today." U.S. Army Corps of Engineers projects the Oxford area could by 2100 experience a 7° F increase in annual temperatures, stronger storms and a 25% increase in March maximum stream flow, a 15% decrease in October minimum flows, and disruptions to species and society (US ACE and ORBA 2017).

Climate action seeks to avoid or mitigate future emissions, while planning for adaptation. In 2015, 195 countries signed the Paris Climate Agreement committing to limit global average temperature increases to below 2°C (3.6°F) and strive for 1.5°C (2.7°F). Cities have joined in this effort via a "Global Covenant of Mayors for Climate and Energy" committing to "take concrete measures with long-term impact" to tackle interconnected challenges of climate change mitigation and adaptation" by (i) reducing /avoiding GHG emissions, (ii) preparing for impacts of climate change, (iii) increasing access to sustainable energy, and (iv) tracking progress. According to the IPCC, limiting warming to 1.5°C effectively requires carbon neutrality by 2050, but U.S. signatories are not required to set particular targets.

Research on Best Practices by Peer Cities

The task force researched climate actions by 38 small-city signatories to the Global Covenant of Mayors (pop. <50,000) and reviewed PSP report survey of GHG reduction targets by 71 signatory cities.

- *GHG Reduction Targets:* Signatory cities have set either a net-zero goal or percentage-reduction targets, typically 80-100% by 2050 over a baseline year. Many cities have phased targets and/or separate goals for municipal operations in earlier years.
- *Climate Action Plans:* Most signatory cities have stand-alone climate action plans, but others have recently begun to incorporate climate action into wider comprehensive planning.
- *Administration:* Climate action is coordinated by cities in collaboration with public stakeholders, tasked to designated staff and committees and/or integrated with existing decision-making.
- *Climate Action Implementation:* Climate action strategies focus on major emissions sectors, which in many cases are traditional areas of municipal focus. Some of these include:
    - Energy: energy conservation, purchasing of renewable energy credits for municipal and community use, development of solar/wind/hydroelectric
    - Public Facilities and Utilities: green building standards for new public facilities, energy efficient street lighting and traffic controls, green infrastructure
    - Transportation: planning and traffic engineering for complete streets, travel-demand management and promotion of alternative transportation, efficient city fleets
    - Buildings: planning for walkable and mixed-use development, promote infill and redevelopment, green building incentives and regulatory standards
    - Waste Reduction: improved recycling and composting, wastewater treatment, biogas
    - Land Use Management: urban forestry, conservation planning, ecological restoration.
- *Public Engagement*: Citizen initiatives are increasingly incorporated into local governance, but also involve continued community-wide collaboration (i.e. climate action task forces).

Communities with sizes and resources comparable to Oxford are prioritizing climate action and integrating it with goal setting, planning, decision-making, operations, and community engagement.

Community Engagement

While climate action may be coordinated by cities, it is a community-wide effort. On June 20, 2019 the task force steering committee hosted a Climate Action Workshop at the Presbyterian Seminary Building, inviting key stakeholders and the general public. 30 people participated, including the steering committee itself, key stakeholder representatives, and diverse individuals.

After a brief presentation on the science of climate change and municipal best practices, staff representatives presented recent accomplishments by the City of Oxford to achieve greater energy efficiency, including facility upgrades, electric aggregation featuring renewable energy credits, and development policies that prioritize walkable and mixed-use urbanization.

Small-groups discussed accomplishments to date and opportunities for GHG reduction focused on buildings/energy, development and transportation, waste reduction, and land management:

- *Buildings and Energy:* Accomplishments include residential electric aggregation featuring renewable energy credits; implementation of energy efficiency requirements via Model Energy Code; zoning that prioritizes infill and adaptive re-use; medium-density and mixed-use development; and technology upgrades in many facilities (e.g. LED lighting, geothermal heating/cooling, etc.). Opportunities include designing public buildings for neutrality, green building incentives and standards, climate impact analysis as part of design review, promoting high-efficiency HVAC (paired with renewable energy sourcing).
- *Waste Reduction:* Accomplishments include recycling 18% of current waste stream, yard waste composting, and new food-scraps composting pilot. Opportunities for improvement include integrating food scraps composting with solid waste contract (or undertake locally), increase residential recycling (e.g. full-sized containers), increase commercial and apartment recycling, reduce recycling contamination, and promotion of alternatives to single-use plastic.
- *Transportation:* Accomplishments include planning and investments for pedestrian and bicycle safety, introduction of public BCRTA transit, planning emphasis on walkability, and promotion of alternative modes (including e-scooters). Opportunities include complete streets design, additional investments in bike and pedestrian safety, shift toward alternate transportation, expand BCRTA to serve year-round residents, and planning for compact/walkable development.
- *Land Use Management:* Accomplishments include tree planting program, open-space preservation (e.g. TVCT), conservation subdivision, and policy emphasis on infill. Opportunities include expanded scope of urban forestry, tree preservation and replacement, expanded ecological restoration and native landscaping (i.e. reduced mowing), and land use education.

Outreach highlighted community consensus for the need for climate action, alignment with existing community values, and many opportunities to reduce emissions while promoting community goals.

Institutional Capacity

Oxford's ability to undertake climate action depends on the City's institutional capacities and the ability to leverage them through effective collaboration. We analyzed ways climate action might be efficiently integrated into existing decision-making, administration, and operation, and what reallocations of staff or budgetary resources might be required to do so.

- *Planning:* Climate-action planning -- inventory, mitigation, adaptation/resilience -- could be developed through upcoming comprehensive planning, projected for 2020. The RFP for consulting planning could be framed around sustainability goals of balancing equity, environment, and economy and climate action goals can be integrated across plan elements/chapters, while also the focus of more specific strategies (e.g. energy).

- *Staffing:* To a significant degree climate action aligns with existing staff priorities, for example cost-reduction through more efficient utility operations. Climate-action planning and implementation could be distributed among relevant staff across departments -- city management, service, community development, economic development, etc. -- incorporated among other priorities. Some responsibilities would be new (i.e. GHG inventory and reporting) but could be met in collaboration with Miami through embedded, in-house interns, for example.
- *Data Collection and Reporting:* The City of Oxford does not currently inventory or track GHG emissions, municipal or community-wide. Some data sources likely exist and can be converted into emissions (e.g. KWH of stationary electricity, fleet fuel usage), while others will require new data gathering (e.g. in or trans-boundary transportation). A department or staff member will need to be tasked with collecting and reporting data, but cannot do this alone: data gathering is an inter-departmental and thus administrative challenge.
- *Implementation:* Climate-related goals and strategies articulated in the Comprehensive Plan can be implemented over time through incorporation in existing planning and decision-making processes, including: budgetary and capital improvements planning, regulations, administrative policies, and decision-making standards by staff and boards/commissions.
- *Community-wide Collaboration:* A community-wide climate commitment will require a joint effort of diverse local jurisdictions, organizations, and individuals. A standing community-wide task force could coordinate planning and implementation among key stakeholders. Or this work of community engagement could be distributed among existing departments and boards/commissions, coordinated by city administration or designated staffer. Conversations with jurisdictional partners are necessary to determine the best model for collaboration.

The City has much of the institutional capacity necessary to weave climate action into its planning and administration. It is already doing many best practices. But making climate action explicit will require careful integration and reprioritization existing responsibilities. It cannot be the work of the Environmental Specialist and Environmental Commission alone, but must be a goal-driven process that cuts across relevant departments and boards/commissions. To the degree the City is guided by an overall strategic planning model, climate-related goals/tactics/metrics/reporting can more efficiently incorporated among other priorities. The Global Covenant of Mayors provides a systematic framework and process for setting ambitious goals, climate action planning, implementation, and reporting.

Task Force Steering Committee

While the Oxford Community Climate Action Task Force engaged diverse members of the public, it was guided by a steering committee formed of elected and appointed officials, staff, and concerned citizens:

Carla Blackmar (Planning Commission)
Prue Dana (citizen)
Mike Driesbach (City of Oxford Service and Engineering Director)
Maddie Maurer (Environmental Commission)
Sam Perry (City of Oxford Community Development Director)
David Prytherch (Council)
Chantel Raghu (Council)
Bill Snavely (Planning Commission)
Sandra Woy-Hazleton (citizen)

It enjoyed close collaboration with Miami University staffers Suzanne Zazycki and Adam Sizemore.

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager: Douglas Elliott

Police
Originating Department

Council Meeting Of: September 3, 2019

Account Code No. #: N/A

John A. Jones
Prepared By

Budgeted Amount: N/A

August 14, 2019
Date Prepared

Agenda Title: Resolution authorizing the acceptance of the Drug Use Prevention Grant in the amount of $21,911.96.

Recommendation: Adopt the Resolution.

Discussion: The Talawanda City School District and the Oxford Police Department have agreed to assign three police officers to the position of School Resource Officer (SRO) for the Talawanda District. The Drug Use Prevention Grant is an ongoing program that enables law enforcement agencies to establish and implement drug abuse resistance education programs in public schools. Grants awarded to a law enforcement agency shall be used by the agency to pay for not more than fifty percent of the amount of the salaries of school resource officers who conduct drug use prevention programs in public schools. Oxford Police Department applied for the grant and was awarded $21,911.96 for the 2019-2020 academic year. This resolution authorizes the acceptance of the grant.

Approved By:

	Initial	Date
Department Head:		
City Manager:	DRE	8-16-19

RESOLUTION NO.

A RESOLUTION AUTHORIZING THE CITY MANAGER TO ACCEPT THE OHIO ATTORNEY GENERAL'S OFFICE DRUG USE PREVENTION GRANT IN THE AMOUNT OF $21,911.96 FOR THE 2019-2020 ACADEMIC YEAR TO ASSIST WITH THE COMPENSATION OF THE CITY'S SCHOOL RESOURCE OFFICERS AND WITH DRUG USE PREVENTION PROGRAMS CONDUCTED IN THE SCHOOLS.

WHEREAS, the drug use prevention grant is an ongoing program that enables law enforcement agencies to establish and implement drug abuse resistance education programs in public schools; and

WHEREAS, grants awarded to law enforcement agencies shall be utilized by the agencies to pay for not more than fifty percent of the salaries of School Resource Officers who conduct drug use prevention programs in public schools; and

WHEREAS, the City Manager and the Police Chief recommend the City Manager be authorized to accept the Ohio Attorney General's Office Drug Use Prevention grant in the amount of $21,911.96 for the 2019-2020 academic year to assist with the compensation of the City's School Resource Officers and with Drug Use Prevention Programs conducted in the schools.

THE COUNCIL OF THE CITY OF OXFORD, OHIO, HEREBY RESOLVES THAT:

SECTION 1: Council accepts the recommendation of the City Manager and the Police Chief and hereby authorizes the City Manager to accept the Ohio Attorney General's Office Drug Use Prevention grant in the amount of $21,911.96 for the 2019-2020 academic year to assist with the compensation of the City's School Resource Officers and with Drug Use Prevention Programs conducted in the schools.

SECTION 2: This resolution shall take effect at the earliest date allowed by law.

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MAYOR

ADOPTED:

ATTEST:

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CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: KATE ROUSMANIERE

PREPARED BY: LAW (STAFF)

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager

City Council
Originating Department

Council Meeting Of: August 20, 2019

Councilor Prytherch/Clerk
Prepared By

Account Code No. #: N/A

Budgeted Amount: N/A

August 12, 2019
Date Prepared

Agenda Title: A Resolution to reestablish the Oxford Parking and Transportation Advisory Board.

Recommendation: Adopt the Resolution

Discussion:

As requested by Councilor Prytherch.

Approved By:

	Initial	Date
Department Head:		
City Manager:	DRE	8-15-19

A RESOLUTION TO REESTABLISH
THE OXFORD PARKING AND TRANSPORTATION ADVISORY BOARD.

WHEREAS, under the Charter of the City of Oxford the Council has the authority to create boards or commissions as it may deem necessary and determine their powers and duties; and

WHEREAS, the 2008 Oxford Comprehensive Plan states a transportation goal of "a quality, accessible transportation system with alternative forms of transportation for a diverse population, improved infrastructure, adequate parking, bikeways and efficient traffic management;" and

WHEREAS, because transportation is an integrated system - linking multiple modes of transportation, land use, and parking resources – policy-making and operation must be coordinated across relevant City departments and boards and with community partners; and

WHEREAS, Oxford City Council identified in its 2019 annual retreat the goal to "Promote Diverse Transportation Options and Accessibility" and tactic to "reinvigorate the Oxford Parking and Transportation Advisory Board."

THE COUNCIL OF THE CITY OF OXFORD, OHIO, HEREBY RESOLVES THAT:

SECTION 1: City Council reestablishes the City of Oxford Parking and Transportation Advisory Board to make recommendations to the City Manager and City Council regarding parking and transportation policies and improvements in the City of Oxford, promoting the goals of the comprehensive plan through:

- integrated planning and management of Oxford's multi-modal transportation system
- capital improvements
- parking policies and rates
- roadway design and other transportation policies
- coordination with local and regional transportation planning and transit agencies

SECTION 2: The board shall be made up of seven (7) voting members representing the following:

1. City Council representative,
2. Planning Commission representative,
3. Environmental Commission representative,
4. Chamber of Commerce representative,
5. Three (3) Community representatives, appointed by City Council,
6. The City Manager or designee shall be an ex-officio member.

SECTION 3: The board shall meet quarterly (and only more often when specifically needed) to best align with the annual decision-making cycle for capital improvements budgeting and street resurfacing. To reduce the burden on staff, a chair shall be appointed by voting members of the board to be responsible (in collaboration with staff) for scheduling meetings, setting agendas, and organizing meetings. A non-staff board secretary shall be appointed with responsibility to take minutes.

SECTION 4: This Resolution shall take effect at the earliest date allowed by law.

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MAYOR

ADOPTED:

ATTEST:

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CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: DAVID PRYTHERCH

PREPARED BY: LAW (STAFF)

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager

City Council
Originating Department

Council Meeting Of: August 20, 2019

Councilor Raghu/Clerk of Council
Prepared By

Account Code No. #: N/A

Budgeted Amount: N/A

August 12, 2019
Date Prepared

Agenda Title: A Resolution calling upon the Ohio Legislature to enact a "Red Flag" law that would allow the seizure of guns before a person can commit an act of violence against self or others.

Recommendation: Adopt the Resolution

Discussion:

As requested by Councilor Raghu.

Approved By:

	Initial	Date
Department Head:		
City Manager:	DRE	8-15-19

RESOLUTION NO.

A RESOLUTION CALLING UPON THE OHIO LEGISLATURE TO ENACT A "RED FLAG" LAW THAT WOULD ALLOW THE SEIZURE OF GUNS BEFORE A PERSON CAN COMMIT AN ACT OF VIOLENCE AGAINST SELF OR OTHERS.

WHEREAS, Governor DeWine has called for passage of "red flag" laws after the mass shooting in Dayton on August 4, 2019; and

WHEREAS, currently there is an innovative law enacted in at least 18 states known as the "red flag" law that allows law enforcement to seize guns from individuals determined to be a threat to themselves or others; and

WHEREAS, "red flag" laws in Indiana, Illinois, Florida, New Jersey, Connecticut, Oregon, Washington, Maryland, and Nevada can be used by family members, mental health professionals, or law enforcement to ask a judge for a "gun violence restraining order" or an "extreme risk protection order" based on someone's violent or troubling behavior; and

WHEREAS, in Connecticut between 1999-2013, researchers found that police served 762 risk warrants, about 50 instances per year, and estimated that a gun suicide was prevented for every 10-20 seizures; police found guns in 99% of the cases in which they served warrants and seized an average of 7 firearms from each person; and

WHEREAS, removal of the gun via a "red flag" law is limited and targeted toward specific individuals and would create opportunities for more social services to address mental health and other safety issues; and

WHEREAS, this Resolution is for the immediate preservation of public peace, property, health and safety.

THE COUNCIL OF THE CITY OF OXFORD, OHIO, HEREBY RESOLVES THAT:

SECTION 1: Council hereby calls upon the Ohio legislature to enact a "red flag" law that would allow the seizure of guns before a person can commit an act of violence against self or others.

SECTION 2: The Clerk of Oxford City Council is directed to transmit copies of this resolution to Governor Mike DeWine and to all members of the Ohio legislature.

SECTION 3: This Resolution shall take effect at the earliest date allowed by law.

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MAYOR

ADOPTED:

ATTEST:

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CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: CHANTEL RAGHU

PREPARED BY: LAW (STAFF)

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to City Manager — Finance (Originating Department)

Council Meeting Of : 8/6/2019

Account Code No. : see below — Joe Newlin (Prepared By)

Budgeted Amount : — 7/30/2019 (Date Prepared)

Agenda Title:	**2019 Supplemental Budget #7**
Recommendation:	**Approve**

Issue 1
To make adjustment to budget for Water Improvement Fund from unencumbered balance - $90,000 The sole water main serving Springwood Subdivision (SR73) is not in the public Right of Way or in a utility easement. The lawyer for the private property owner has asked the City to abandon this main as it sits adjacent to their home's foundation. City staff has designed a new water main that will be installed by City crews later in 2019. (pending permits from OEPA, ODOT, and BCEO)

Action Needed:

Revenue Side

N/A

Expense Side

Water Improvement Fund (322)	90,000.00	Increase for water main materials
Net Effect on Fund Balance/(s) Increase/(Decrease)	(90,000.00)	
Total Net Effect on Fund Balance/(s) Increase/(Decrease)	(90,000.00)	
Breakdown by Fund		
Water Improvement Fund (322)	(90,000.00)	
Net Effect on Fund Balance/(s) Increase/(Decrease)	(90,000.00)	

Approved By:

	Initials	Date
Department Head:		7/31/19
City Manager:	DRE	8/2/19

ORDINANCE NO.

AN ORDINANCE AMENDING ORDINANCE NO.3493. SUPPLEMENTAL BUDGET ORDINANCE NUMBER 7 TO MAKE SUPPLEMENTAL APPROPRIATIONS FOR FISCAL YEAR 2019.

WHEREAS, additional appropriations are needed for the current fiscal year and monies are available for appropriation in those funds, and changes to estimated revenues.

THE COUNCIL OF THE CITY OF OXFORD, OHIO, HEREBY ORDAINS THAT:

SECTION 1: Additional appropriations are needed for the current fiscal year and monies are available for appropriation in those funds, and changes to estimated revenues;

SECTION 2: The following increase/(decrease) in appropriations from unencumbered balances be made:

Water Improvement Fund 322	90,000.00

SECTION 3: In all other respects, Ordinance No. 3493 shall remain in full force and effect.

SECTION 4: This ordinance shall take effect immediately upon its adoption.

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MAYOR

ADOPTED: _____

ATTEST:

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CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: KATE ROUSMANIERE

PREPARED BY: LAW (STAFF)

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager

City Council
Originating Department

Council Meeting Of: August 20, 2019

Councilor Prytherch/Clerk of Council
Prepared By

Account Code No. #: N/A

Budgeted Amount: N/A

August 12, 2019
Date Prepared

Agenda Title: A Resolution accepting the Planning Commission's recommendation and approving the adoption of the Oxford Complete Streets Policy and incorporating the same into the Transportation Chapter of the Oxford Comprehensive Plan.

Recommendation: Adopt the Resolution

Discussion:

As requested by Councilor Prytherch.

Approved By:

	Initial	Date
Department Head:		
City Manager:	DRE	8-16-19

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager

Community Development Department
Originating Department

Council Meeting Of:

Account Code No. #:

Budgeted Amount:

March 26, 2017
Date Prepared

Agenda Title:	**A Resolution to accept the Planning Commission Recommendation to Adopt the Complete Streets Policy**

Recommendation:	**Approval**

Discussion:
For some time, the Oxford Planning Commission has been working on the development of a Policy that outlines the mission of the City's transportation improvements projects for a safe, attractive and connected roadway system for all the users of the public right-of-way, regardless of their mode of transportation, age or abilities throughout the City. The Complete Streets policy is the outcome of this long deliberation and discussion from the Planning Commission.

Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. This policy is meant to be a guiding policy to recognize that alternative modes of surface transportation plays a pivotal role in moving people and to reflect the community values and quality of environmental stewardship, safety, security, mobility and individual freedom.

A great deal of effort has been made in the Oxford roadway system to be more inclusive, including bike lanes, sidewalks and ramps. Additionally, the collaboration between Miami University and the City in coordinating the roadway improvements to encourage more walking, biking in and around the campus also allows for more improvements for all users. How to sustain these efforts and to instill the idea of making the City roadway system for everyone has been the topic for many municipalities. Over thousands of U.S. cities have adopted the Complete Streets policy to shift the focus of roadway improvements to be more inclusive to accommodate all users.

The policy recognizes that there is no one design standards for all streets and is context-based. The design of particular project will take in various factors, such as local needs, adjacent land uses, traffic volume and speed, as well as current and future demands to develop a sensitive design that incorporates the most up-to-date, widely-accepted design standards for everyone. It also provides exemptions to adhere to this policy due to particular circumstances and cost factors.

Given that the grassroots in supporting alternative modes of transportation has grown to support the construction of OATS Trail, the Planning Commission felt that this is a policy that would be beneficial to the community and shared this with the City Council at their joint meeting.

The Commission voted unanimously in its January meeting to recommend that Council to adopt this Complete Streets Policy.

RESOLUTION NO.

A RESOLUTION ACCEPTING THE PLANNING COMMISSION'S RECOMMENDATION AND APPROVING THE ADOPTION OF THE OXFORD COMPLETE STREETS POLICY AND INCORPORATING THE SAME INTO THE TRANSPORTATION CHAPTER OF THE OXFORD COMPREHENSIVE PLAN.

WHEREAS, Council finds in accordance with Section 1125.01 of the Codified Ordinances of the City of Oxford, the Oxford Planning Commission held a public hearing on January 10, 2017 regarding the adoption of the Oxford Complete Streets Policy; and

WHEREAS, the Oxford Planning Commission, after public hearing and deliberation, recommended approval of the Oxford Complete Streets Policy attached hereto and incorporated herein as Exhibit "A".

SECTION 1: City Council hereby accepts the recommendation of the Oxford Planning Commission, and after deliberation, approves the adoption of the Oxford Complete Streets Policy attached hereto and incorporated herein as exhibit "A" and further directs that the same shall be incorporated into the Transportation Chapter of the Oxford Comprehensive Plan.

SECTION 2: This resolution shall take effect at the earliest date allowed by law.

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MAYOR

ADOPTED:

ATTEST:

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CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: DAVID PRYTHERCH

PREPARED BY: LAW (STAFF)

EXHIBIT "A"

CITY OF OXFORD
HOME OF MIAMI UNIVERSITY

Complete Streets Policy

Vision

The surface transportation network will become better connected, safer, more attractive, and accessible for all users of the public right-of-way, regardless of their mode of transportation, age or abilities, as transportation projects throughout the City are designed, constructed, reconstructed by using complete street principals. All users will experience a visually attractive and functional environment while traveling safely and conveniently on and across all surface roadways within the City of Oxford. This vision is to make the network more complete when necessary roadway resurfacing, reconstruction, and/or expansion is planned. Complete Streets are defined as streets that are designed for all users of the public right-of-way who can safely and conveniently reach their designations along and across a street or road, regardless of their chosen mode of transportation, age or physical condition. All users include: pedestrians, cyclists, transit and school bus riders, people with disabilities, motorists, freight haulers, service personnel, and emergency responders.

Purpose

Streets are an integral component of the City. They play a vital role in the social and economic health of the community by providing the primary physical link between citizens, businesses, and institutions of the City. The purposes of this policy are as follows:

1. To recognize that alternative modes of surface transportation play a pivotal role in moving people and goods.
2. To further articulate the Oxford Comprehensive Plan in creating a quality, accessible transportation with alternative forms of transportation for a diverse population.
3. To encourage improvement to the surface transportation networks to balance the needs of all users; and
4. To incorporate the community values and quality of environmental stewardship, safety, security, mobility and individual freedom.

The implementation of this policy shall also follow the recommendations articulated in the Bike and Pedestrian Safety Plan, as adopted by City Council, to provide optimal network connections for all users of the Oxford Community.

Goals

A. Ensure that the needs of all users are balanced throughout the surface transportation network to the greatest reasonable measure.
B. Incorporate the vision, purpose, and goals of this policy into all aspects of the project development process for surface transportation projects.
C. Create a balanced, comprehensive, integrated, fully interconnected, functional and visually attractive surface transportation network.

D. Promote the use of the latest and best "complete streets" design standards, principals, policies, and guidelines within the context of the community.

Benefits of Complete Streets

By providing, when appropriate, features such as accessible sidewalks, designated bike facilities and accessible transit stops, livable streets encourage walking, transit uses and biking, all of which have important health benefits. By shifting a share of automobile traffic to walking, biking and transit, livable streets (complete streets) help reduce the demand for fossil fuels ease automobile congestion, reduce wear on roadways, improve air quality and make streets more attractive for businesses and customers, and increases economic activity at the neighborhood level.

Policies

The City of Oxford surface transportation network shall balance the need for all current and future users. Project identification, planning, scoping, and design for new construction, reconstruction, resurfacing, rehabilitation within the public right-of-way shall adhere, where applicable, to the following:

1) There is no one design standard that achieves the complete streets outcome. Design of particular projects will be context-sensitive, consideration of adjacent land uses and local needs and incorporating the most up-to-date, widely–accepted design standards for the particular setting, traffic volume and speed, and current and projected demand. Each project must be considered both separately and as part of a connected network to determine the level and type of treatment necessary for the street to be complete. Additional principals, policies and guidelines may be found under the Best Practice Design.

2) Exemption under one (1) or more of the following conditions as determined by the City Manager:

    a. Where bicyclists and pedestrians are prohibited by law from using the roadway, or
    b. Where the cost of providing such accommodations would be disproportionate given the need or probability of use, or
    c. Where severe topographic or natural resource constraints prohibit such accommodations, or
    d. Where conditions or restrictions outside the purview of the City of Oxford prohibit such actions.
    e. Where the project consists primarily of the installation of traffic control or safety devices.
    f. Where roadway safety standards or bicycle and pedestrian safety standards cannot be met.

3) Where accommodations for all users cannot be made, reasonable efforts shall be made to identify adjacent alternative routes and/or methods of travel to provide a safe, reliable, integrated, and interconnected surface transportation network.

4) Roadways, sidewalks, shared-use paths, street crossings, pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated,

and maintained so that all users of the surface transportation network can travel safely, reliably, and independently.

5) The implementation of this policy shall reflect the context and character of the surrounding built and natural environment, and enhance the appearance of such.

6) The design and development of surface transportation infrastructure shall be in accordance with all City of Oxford ordinances, codes, plans, policies, and guidelines where appropriate.

7) A system of performance measurements shall be established to gauge the success of this Policy with regards to the stated Goals above.

Sample of Performance Measurement:

The success of this policy will be measured in the following quantitative ways:

1. Lane-mile of on-street bike routes.
2. Percentage of resurfacing, reconstruction and expansion projects that are exempted from adhering to this policy.
3. Conformance to the Bike and Pedestrian Safety Improvement Plan.
4. Percentage of roadways that do not have sidewalks, crossings.

Best Practice Design:

1) AASHTO Design Publications: Guide for the Development of Bicycle Facilities, 4th Edition.
2) American Planning Association Publication: "Complete Streets: Best Policy and Implementation Practices.
3) National Association of City Transportation Official- Urban Street Design Guide: http://nacto.org/publication/urban-street-design-guide/
4) National Complete Streets Coalition: Smart Growth America The best Complete Street Policies of 2015 and a web link http://www.smartgrowthamerica.org/complete-streets/changing-policy/policy-elements
5) Design Walkable Urban Thoroughfares: http://www.ite.org/css/
6) OHIO Department of Transportation Bike and Pedestrian Program (http://www.dot.state.oh.us/Divisions/Planning/SPR/bicycle/Pages/Resources.aspx)
7) ODOT Transportation Alternatives Program Guidance http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Documents/TAP/2016%20Transportation%20Alternatives%20Program%20Guidance.pdf
8) US DOTA Policy Statement: "Design Guidance Accommodating Bicycle and Pedestrian Travel: A Recommended Approach": http://www.dot.fhwa.dot.gov/environment/bikeped/design.htm
9) US DOT Bicycle and Pedestrian Program: Bicycle Facilities and the Manual on Uniform Traffic Control Device. http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/mutcd/

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager

City Council Meeting of: August 20, 2019

Account Code #: 330.830.69150 & 69159

Budgeted Amount: $249,000.00

Service Department
Originating Department

Michael B. Dreisbach, Service Director
Prepared By

August 8, 2019
Date Prepared

Agenda Title: Contract for the Replacement of Bar Screen and Grit Removal Equipment for the Wastewater Treatment Plant

Recommendation: Approve

Discussion:

The 2019 capital improvement plan includes funding for the replacement of bar screen and grit removal equipment at the City's Wastewater Treatment Plant. This equipment removes inorganic waste and grit from wastewater influent which are detrimental to the biological treatment processes utilized at our Plant.

Staff prepared plans, drawings, and specifications for this improvement and advertised the project for bids on July 12 and July 19, 2019 in *The Journal News* and other plan clearinghouses. Bids were opened on July 26, 2019, with the following results:

Downing Construction Co, Inc.	**$198,400.00**
Building Crafts, Inc.	**226,000.00**

The City has not worked with Downing Construction Co. in the past, and has checked numerous references. Downing Construction Co. received positive comments from all of our contacts and has done work similar to this project in the past.

Staff recommends the City Council authorize the City Manager to enter into an agreement with Downing Construction Co., Inc. for the replacement of bar screen and grit removal equipment per project specifications at a cost of $198,400.00. Staff is also requesting a contingency in the amount of $19,840.00, therefore the contract amount not to exceed shall be **$218,240.00.**

Approved By:

	Initial	Date
Department Head:	MBD	8/8/19
City Manager:	DRE	8-16-19

RESOLUTION NO.

A RESOLUTION ACCEPTING THE BID SUBMITTED BY DOWNING CONSTRUCTION CO., INC. AND AUTHORIZING THE CITY MANAGER TO ENTER INTO A CONTRACT WITH DOWNING CONSTRUCTION CO., INC. FOR THE REPLACEMENT OF BAR SCREEN AND GRIT REMOVAL EQUIPMENT PER PROJECT SPECIFICATIONS AT THE CITY'S WASTEWATER TREATMENT PLANT AT A COST OF $198,400.00 PLUS A CONTINGENCY IN THE AMOUNT OF TEN PERCENT (10%) OF THE CONTRACT PRICE OR $19,840.00 FOR A TOTAL COST NOT TO EXCEED $218,240.00.

WHEREAS, the City advertised for bids on July 12, 2019 and July 19, 2019 in the *Journal News* and in plan clearinghouses. Two (2) sealed bids were opened and publicly read on July 26, 2019. The lowest and best bid was provided by Downing Construction Co., Inc. in the amount of $198.400.00; and

WHEREAS, the City Manager and the Service Director recommend City Council accept the bid of Downing Construction Co., Inc. as the lowest and best bid for the replacement of bar screen and grit removal equipment per project specifications at the City's Wastewater Treatment Plant at a cost of $198,400.00 plus a contingency in the amount of ten percent (10%) of the contract price or $19,840.00 for a total cost not to exceed $218,240.00.

SECTION 1: City Council hereby accepts the recommendation of the City Manager and the Service Director and finds Downing Construction Co., Inc. to be the lowest and best bidder and accepts the bid of $198,400.00 for the replacement of bar screen and grit removal equipment at the City's Wastewater Treatment Plant.

SECTION 2: City Council further authorizes the City Manager to enter into a contract with Downing Construction Co., Inc. for the replacement of bar screen and grit removal equipment per project specifications at the City's Wastewater Treatment Plant at a cost of $198,400.00 plus a contingency in the amount of ten percent (10%) of the contract price or $19,840.00 for a total cost not to exceed $218,240.00.

SECTION 3: This resolution shall take effect at the earliest time allowed by law.

_____
MAYOR

ADOPTED:

ATTEST:

_____
CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: KATE ROUSMANIERE
PREPARED BY: LAW (STAFF)

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager

Council Meeting of: August 20, 2019

Service Department
Originating Department

Account Code #: N/A

David Treleaven
Prepared By

Budgeted Amount: N/A

August 8, 2019
Date Prepared

Agenda Title:	Environmental Commission Meeting of August 7, 2019

Recommendation:	For Review and Consideration

Discussion:

Environmental Commission members present at the Wednesday, August 7, 2019 meeting were: Chair, Mr. Wright Gwyn; Vice-Chair, Ms. Madeline Maurer; City Council Representative, Ms. Chantel Raghu, and Mr. Andor Kiss. A quorum was present. Planning Commission Representative, Ms. Carla Blackmar, and Mr. Jon Ralinovsky had previously informed the Commission that they would be unable to attend the August meeting. Also in attendance was Ms. Suzanne Zazycki, Assistant Director of the Miami University (MU) Institute for the Environment and Sustainability Department (IES).

The minutes from the June 5, 2019 Environmental Commission meeting was unanimously approved as presented.

Ms. Zazycki attended the evening's Commission meeting to inquire if the Environmental Commission was interested in continuing to be the client of the IES 2019-2020 academic year Professional Service Project (PSP) inventorying the greenhouse gas (GHG) emissions associated with the Oxford municipal operations. An initial PSP had been undertaken during the 2018-2019 MU academic year by a team of IES graduate students, to quantify the carbon footprint of Oxford's municipal operations, with the Commission as the client. In the course of the PSP (entitled: "Understanding a Local Government Operations GHG Inventory"), the data collection and processing was found to be more complicated, tedious, and time consuming than initially anticipated, and the entire GHG inventory was not completed. However, one of the products produced by the PSP team was an instructional manual on the use of ClearPath Pro, which is a Global Protocol for Community-Scale Emissions compliant GHG inventory software tool. Access to ClearPath is through Oxford's annual membership in the Local Governments for Sustainability. With the newly adapted PSP schedule, the graduate students have three to three and a half months (January into April) to collect and process any data, with a final presentation and report due by early May. Ms. Zazycki proposed that the GHG emission data (distribution of questionnaires to appropriate City Divisions and to Rumpke of Ohio) is collected from Oxford during the fall with herself and City staff, so the data would be available for the PSP team starting in January, 2020. The Environmental Commission concluded that any effort to reduce Oxford's GHG emission would need a baseline inventory, and unanimously chose to be the client for this academic year's PSP.

(Continued)

Approved By:		Initial	Date
	Department Head:	MBS	8/12/19
	City Manager:	DRE	8/16/19

Mr. Gwyn informed Commissioners that Community Development Director, Mr. Sam Perry, and he had continued discussions regarding the draft Tree Protection and Preservation Ordinance. Mr. Gwyn indicated that Mr. Perry was still reluctant about having a stand-alone tree protection and preservation ordinance, and believes that the desired benefits could be achieved by simply adding the requirement of a tree survey to existing codes for Major Subdivision or Planned Developments, along with the inclusion of standard drawings of protection of existing trees during construction activities (existing tree protection is already included in Oxford's Codified Ordinances). One of the sticking points was tree preservation and protection of landmark and/or protected trees on residential private property of one acre or less. Mr. Gwyn proposed that only construction on owner-occupied residential property requiring a building permit from the Community Development would be impacted by at least some of the draft preservation and protection ordinance requirements. If a permit was required, there would be the requirement of preparing a site drawing depicting the landmark and protected tree locations. Landmark and protected trees removed for the construction could either be replaced with a two-inch caliber tree of the same species planted on the property, or by payment to a Tree Fund in the amount that was the average cost of a 2-inch diameter tree planted during the most recent City of Oxford Tree Planting Project (typically conducted in the late fall). Commissioners indicated that this was considered a good compromise of protecting or replacing landmark/protected trees on residential private properties while trying to reduce the potential cost to the residential property owner. A Motion was proposed as follows:

Motion:

The Environmental Commission accepts the draft Tree Preservation and Protection Ordinance in its current form and content, and instructs Staff to provide the draft Ordinance to the Planning Commission for their review and/or comments.

The Motion passed unanimously.

Mayor Kate Rousmaniere had provided the Commissioners with a proposal and associated background information pertaining to the City of Oxford purchasing, installing, and maintaining equipment for the public to charge electrical vehicles. Mayor Rousmaniere requested that the Environmental Commission consider supporting this proposal. As the Commission has been researching the acquisition of electrical vehicle chargers for some time, the Commissioners indicated that they would support such a request. The following Motion was proposed:

Motion:

The Environmental Commission supports the City of Oxford's effort to obtain, install, and maintain a publically accessible electrical vehicle charging station as outlined in the July 16, 2019 request from Mayor Rousmaniere. The Environmental Commission also recommends that any surplus funding generated by the monies paid by the public to utilize the electrical vehicle chargers be designated to efforts to further expand the number of publically-accessible electrical vehicle charging stations in the community.

The Motion passed unanimously. A copy of Mayor Rousmaniere's July 16, 2019 request is attached to this Staff Summary Report.

Councilor Raghu informed Commissioners that she was proposing three items for City Council consideration during the upcoming 2020 budget discussions, these being: A) Divestment of fossil fuel-related investments in Oxford's holdings; B) Prohibition of the City of Oxford utilizing single-use plastic bottles (barring any public health or emergency situations); and C) Continuation and ultimate expansion of the food scraps composting pilot program. The divestment is considered to be at least budgeting neutral in the immediate future, and could be a financially wise decision in the long term, as potential restrictions on the use of fossil fuels (in an effort to combat global climate change) are enacted. Eliminating the City of Oxford's use of single-use plastic bottles should be a budget-positive decision, as potable tap water is much less expensive than bottled water. Continuing the food scraps drop-off program for the 2020 year would cost approximately $14,700 (assuming no rate increase from the hauler, GoZERO Services for 2020 and no expansion in the number of the drop-off containers). Oxford has

approximately 4,800 total refuse and recycling accounts. Paying for the food scrap drop-off program in 2020 could be accomplished by an approximate monthly charge of $0.26 to each account. Curbside residential food scrap collection would likely be cost-prohibitive at the present. GoZERO Services has estimated a monthly fee of $12 if all residential accounts (referred to as "non-subscription" service) are included in the service. Presently, there are approximately 3,200 residential accounts, so the monthly expense for curbside food scraps collection would be approximately $38,400, with an annual expense of some $460,800. If individual residents wish to enlist GoZERO Services to provide curbside food scrap collection, the estimated fee would be $19 per month, and would require at least 300 residential accounts to subscribe with GoZERO Services.

The following Motions were presented for consideration:

Motion:

The Environmental Commission supports City Councilor Raghu's proposal for the City of Oxford's 2020 budget considerations to divest Oxford's investment holdings in any fossil fuel-related equities, bonds, and/or funds.

The Motion passed unanimously.

Motion:

The Environmental Commission supports City Councilor Raghu's proposal for the City of Oxford's 2020 budget considerations for the elimination of the City of Oxford's use (except in situations of public health or other emergencies) of single-use plastic water bottles.

The Motion passed unanimously.

Motion:

The Environmental Commission supports City Councilor Raghu's proposal for the City of Oxford's 2020 budget considerations for the continuation of the existing pilot program of residential food scrap drop-off for composting.

The Motion passed unanimously.

Staff informed the Commission that the draft of the refuse and recycling contract document and specifications had been completed. Several of the Environmental Commission's recommendations have been incorporated into the document's text and request for prices, including an option for a lower volume of residential services ("Discounted Service"), having the 65-gallon lidded, waste wheeler cart be the default of residential recycling service (23-gallon red bins available upon request) each with no monthly rental fee, and a request for residential curbside food scraps collections. Presently, it is anticipated that the contract document and specifications will be made available to waste haulers in mid-September 2019, with their price submittals due in early to mid-October 2019.

A summary of the residential food scraps drop-off pilot program was provided and discussed.

Staff informed the Commission that the annual Tree Maintenance Project had started. Twenty one public trees (three of which were Ashes) were scheduled to be removed, and two stumps in the tree lawn were to be ground-out. Staff has started to compile planting locations for the annual Fall Tree Planting Project, and has noted that there are a large number of potential planting locations in the residential area between Tollgate Drive and West Chestnut Street.

Commissioners concluded discussions at 8:55 p.m. The next Environmental Commission meeting is tentatively scheduled for 7:00 pm on September 4, 2019, in the Municipal Building's First Floor Conference Room.

Electric Car Charger Proposal for Environmental Commission consideration
From Kate Rousmaniere, Mayor
July 16, 2019

I propose that the City of Oxford budget for the installation of one electric charger station w/ 2 plugs for the city garage. Service Director Mike Dreisbach and the City Manager have been talking about this for some time and have ideas and seem ready to move on it.

I am requesting Environmental Commission endorsement to further this proposal for City Council budgeting approval. Is the Environmental Commission supportive of moving this proposal forward?

Ray Cardona of the Cincinnati Electric Car Club, recommends the HCS-40 at $565. See on Clipper Creek.com website https://store.clippercreek.com/hcs-40-hcs-40p-ev-charging-station?search=HCS-40%20

HCS-40, 32 Amp Level 2 EVSE, 240V, with 25 ft cable

- Brand: ClipperCreek
- Product Code: 0909-00-003
- Availability: In Stock

- $565.00

Ray Cardona from Cincinnati Electric Car Company says: "Once above 30 amps, for most EVs and plug-in hybrids, those units do not offer added benefits. The next level down is 24 amps and that would an option but no lower. The price difference between these two is only $65. Clipper Creek shows a lot of options but these are of different plugs. The HCS-40 hardwire at $565 is "the most popular" for a reason and it's what I have at home. It's reliable, very low draw when not charging a car, 25 foot cable is excellent and the built in cord hanging feature means the cord is easy to store. That model is my recommendation. For post mounting, Clipper Creek has excellent quality units which reflect on the prices. Electric and safety codes will also have to be considered. Some locations have safety posts located between the unit and parking space to prevent vehicles from damaging the post installed units."

Further Questions/Considerations for us

- Once installed, there are a number of electric car charger location maps, like Plug Share.com that we should get added to. https://www.plugshare.com/

- We will have to decide if we want to do free charging or a meter. If we charge, we could assign the funds raised to a fund to be used to buy a second charging station later.

Here's how Yellow Springs does the charging: Cost for the "park and charge" service will be $1.50 per hour until the electric charge is complete, after which the fee will roll over into a parking fee of $5 per hour (to further turnover) The charging stations can be set up to notify owners of charge completion by text message, and fees are designed to incentivize turnover.
https://ysnews.com/news/2012/11/village%E2%80%99s-own-battery-park

- We might also want to consider a special penalty for a non-electric car parking in the charging space.

- Do we need a special maintenance contract with the charging company?

- Other similarly sized communities that have electric chargers: (click on the site on the PlugShare.com website for information about what they offer.
    - Yellow Springs Ohio
    - Greensburg Indiana
    - Mount St. Francis Indiana

- A lot of community parks have charger stations. Do we want to get one for the Community park too?

- Parking signs may be an addition expense.
https://www.myparkingsign.com/mpds/charging-station.aspx?engine=googlebasemobile&keyword=Charging+Station&skuid=K-7798-RE-12x18-D1&gclid=EAIaIQobChMI4vyK4J644wIVjp-fCh2Ryg9nEAQYASABEgLKuvD_BwE

The Cincinnati Electric Car Club: We provide electric vehicle awareness via "Drive & Ride" events and parades and showing our cars to the general public, civic and public officials. Drive & Ride means our cars can be driven by others or we can give demonstration rides explaining the features and technology. Please, let us know what we can do to assist your efforts to bring chargers to Oxford. Thank you. Ray Cardona Cincinnati Electric Car Club Cell: 513-807-9342. ray.cardona68@gmail.com

CITY OF OXFORD
STAFF SUMMARY REPORT

Report to the City Manager

City Manager
Originating Department

Council Meeting Of: August 6, 2019

Doug Elliott
Prepared By

Account Code No. #: N/A

Budgeted Amount: N/A

July 29, 2019
Date Prepared

Agenda Title: An Ordinance Accepting The Annexation Petition From Douglas R. Elliott, Jr. for 148.258 Acres Of Land In The Township Of Oxford, Butler County Ohio, And Accepting Said Territory To Be Annexed.

Recommendation: Adopt the Ordinance.

Discussion:

Miami University and the City of Oxford submitted on April 19, 2019 an annexation petition to the Butler County Commissioners. (The procedure utilized was Expedited Type II Annexation). The petition proposed to annex five parcels of land (part of Miami University Airport) totaling 148.258 acres off of Fairfield and Brookville Roads next to the Oxford Community Park. The primary reason for the annexation is to enable the City to lower the speed limit and consider other improvements for pedestrian and driver safety near the entrance to the Oxford Community Park off of Fairfield Road. The City Manager served as the agent for the petitioner. The County Commissioners approved the annexation on May 20, 2019. The last step is for City Council to adopt an Ordinance Accepting the Annexation.

Approved By:

	Initial	Date
Department Head:		
City Manager:	DRE	8-2-19

ORDINANCE NO.

AN ORDINANCE ACCEPTING THE ANNEXATION PETITION FROM DOUGLAS R. ELLIOTT, JR. FOR 148.258 ACRES OF LAND IN THE TOWNSHIP OF OXFORD, BUTLER COUNTY OHIO, AND ACCEPTING SAID TERRITORY TO BE ANNEXED.

WHEREAS, on April 19, 2019 Douglas R. Elliott, Jr., Agent for the petitioners, filed a petition with the Board of County Commissioners of Butler County, Ohio, to obtain annexation to the City of Oxford, Butler County, Ohio, territories consisting of 148.258 acres of land contiguous to the City of Oxford and the existing corporation line of the Township of Oxford, Ohio. Said petition was filed with the consent of all parties utilizing the annexation procedure set forth in Sections 709.021 and 709.023 of the Ohio Revised Code.

WHEREAS, the Board of County Commissioners did, by Resolution No.19-05-00904 adopted on May 20, 2019, approve the annexation of the proposed territory to the City of Oxford as hereinafter described. Such approval was subject to the terms and conditions contained in the Statement of Services Resolution No.7076 a copy of which is attached hereto as Exhibit "A" and incorporated herein by reference.

WHEREAS, the Board of County Commissioners did, through the Clerk of the Board of County Commissioners, Butler County, Ohio, certify a transcript of the proceedings in connection with the map and petition required herein to the Clerk of Oxford City Council who received the same on or about May 29, 2019.

WHEREAS, a certified transcript of the proceedings for annexation with an accurate map of the territory, together with the petition for annexation and the papers relating to all proceedings heretofore with the County Commissioners, are all on file with the Clerk of the City of Oxford and have been for sixty days.

SECTION 1: The proposed annexation, as applied for in the petition of the owner of the real estate in the territory sought to be annexed and filed with the Board of County Commissioners, Butler County, Ohio, in which the petition prayed for annexation to the City of Oxford, Ohio, of certain territory adjacent thereto as hereinafter described, be and the same is hereby accepted and deemed annexed to the City of Oxford, subject to all the terms and conditions provided herein and contained within the Statement of Services Resolution No. 7076 attached hereto and incorporated herein as Exhibit "A". The territory to be annexed is more particularly described in Exhibits "B" and "C," attached hereto and incorporated herein.

SECTION 2: The Clerk of the City of Oxford be and is hereby authorized and directed to make five copies of this ordinance, to each of which shall be attached a copy of the map accompanying this petition for annexation, a copy of the transcript of the proceedings of the Board of County Commissioners of Butler County, Ohio, related thereto, and certified as to the correctness thereof. The Clerk shall then forthwith deliver one copy to the County Auditor, one copy to the County Recorder, one copy to the County Engineer, and one copy to the Ohio Secretary of State and shall file notice of this annexation with the Board of Elections within thirty (30) days after it becomes effective and the Clerk shall do all other things as required by law.

SECTION 3: This Ordinance shall take effect at the earliest time allowed by law.

_____
MAYOR

ADOPTED:

ATTEST:

_____
CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: KATE ROUSMANIERE

PREPARED BY: LAW (STAFF)

EXHIBIT 'A'

RESOLUTION NO. 7076

A RESOLUTION ADOPTING A STATEMENT INDICATING THE SERVICES THE CITY OF OXFORD, OHIO WILL PROVIDE TO THE TERRITORY PROPOSED TO BE ANNEXED TO THE CITY OF OXFORD, OHIO PURSUANT TO A PETITION FILED WITH THE BOARD OF COUNTY COMMISSIONERS OF BUTLER COUNTY, OHIO BY DOUGLAS R. ELLIOTT JR., AGENT FOR PETITIONER, AS PROVIDED BY OHIO REVISED CODE SECTION 709.023.

WHEREAS, the City of Oxford desires to lower the speed limit and initiate other improvements for pedestrian, cyclist and motorist safety near the entrance to the Oxford Community Park which is currently outside of the City limits; and

WHEREAS, Oxford Codified Ordinance Section 921.39 E. states in part "The property or properties served by the extension of a municipal utility shall be required to annex into the City upon the official request of the City".

THE COUNCIL OF THE CITY OF OXFORD, OHIO, HEREBY RESOLVES THAT:

SECTION 1: Council, having received the notification of a petition for annexation from The President and Trustees of The Miami University of Oxford, Ohio for 148.258 acres of land in the Township of Oxford, Butler County, Ohio hereby accepts said petition.

SECTION 2: Council hereby adopts this resolution indicating what services the City will provide to the land to be annexed to the City in accordance with Ohio Revised Code Section 709.023(C).

SECTION 3: The City of Oxford, Ohio hereby states that it will provide, upon the finalization of the annexation, the following services to the Territory: law enforcement, recreation programming, maintenance of any and all public streets and alleyways, keeping same open, in repair and free from nuisance, and professional planning staff; which said services shall be available immediately or as required thereafter upon finalization of the annexation. In addition, the facilitation of public utility services which include potable water, sanitary and storm sewerage, solid waste collection and disposal, electricity, street lighting and fire inspection, fire protection, paramedic and ambulance services, and any and all other services provided to or made available to the citizens of the City of Oxford, Ohio, as appropriate shall be available as the Territory is developed and such services become appropriate. Extension of all public utility services shall be subject to such regulations, conditions and fees as the City deems appropriate.

SECTION 4: The Clerk is hereby directed to forward a certified copy of this resolution to the Board of County Commissioners of Butler County, Ohio.

SECTION 5: This resolution shall take effect at the earliest date allowed by law.

MAYOR

ADOPTED: May 7, 2019

ATTEST:
CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: KATE ROUSMANIERE

PREPARED BY: LAW (STAFF)

RESOLUTION NO. 7075

A RESOLUTION ACCEPTING THE ANNEXATION PETITION TO THE CITY OF OXFORD, OHIO OF CERTAIN TERRITORY PROPOSED TO BE ANNEXED TO THE CITY OF OXFORD, OHIO PURSUANT TO A PETITION FILED WITH THE BOARD OF COUNTY COMMISSIONERS OF BUTLER COUNTY, OHIO BY DOUGLAS R. ELLIOTT JR., AGENT FOR PETITIONER, AS PROVIDED BY OHIO REVISED CODE SECTION 709.023.

WHEREAS, the City of Oxford desires to lower the speed limit and initiate other improvements for pedestrian, cyclist, and motorist safety near the entrance to the Oxford Community Park which is currently outside of the City limits; and

WHEREAS, the City Manager recommends Council accept the annexation petition from The President and Trustees of The Miami University of Oxford, Ohio for 148.258 acres of land off of Fairfield Road in the Township of Oxford, Butler County, Ohio.

THE COUNCIL OF THE CITY OF OXFORD, OHIO, HEREBY RESOLVES THAT:

SECTION 1: Council, having received the notification of a petition for annexation from The President and Trustees of The Miami University of Oxford, Ohio for 148.258 acres of land in the Township of Oxford, Butler County, Ohio hereby accepts said petition.

SECTION 2: Council hereby consents to the annexation petition from The President and Trustees of The Miami University of Oxford, Ohio for 148.258 acres of land in the Township of Oxford, Butler County, Ohio in accordance with Ohio Revised Code Section 709.023(D).

SECTION 3: The Clerk is hereby directed to forward a certified copy of this resolution to the Board of County Commissioners of Butler County, Ohio.

SECTION 4: This resolution shall take effect at the earliest date allowed by law.

Kate Rousmaniere
MAYOR

ADOPTED: May 7, 2019

ATTEST: MaryAnn Eaton
CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: KATE ROUSMANIERE

PREPARED BY: LAW (STAFF)

RESOLUTION NO. 7077

A RESOLUTION REGARDING ZONING BUFFERS IN A PROPOSED ANNEXATION OF PROPERTY CONTAINING 148.258 ACRES FROM OXFORD TOWNSHIP, BUTLER COUNTY, OHIO TO THE CITY OF OXFORD, BUTLER COUNTY, OHIO PURSUANT TO THE REQUIREMENT OF SECTION 709.023(C) OF THE OHIO REVISED CODE.

WHEREAS, the City of Oxford desires to lower the speed limit and initiate other improvements for pedestrian, cyclist and motorist safety near the entrance to the Oxford Community Park which is currently outside of the City limits.

THE COUNCIL OF THE CITYOF OXFORD, OHIO, HEREBY RESOLVES THAT:

SECTION 1: Council, having received the notification of a petition for annexation from The President and Trustees of The Miami University of Oxford, Ohio for 148.258 acres of land in the Township of Oxford, Butler County, Ohio ("the Territory"), hereby accepts said petition.

SECTION 2: If the Territory becomes subject to zoning by the City and the City permits uses in the annexed territory that the City determines are clearly incompatible with the uses permitted under current county or township zoning regulations in the adjacent land remaining within the township from which the Territory was annexed, City Council will require, in the zoning ordinance permitting the incompatible uses, the Petitioner to provide a buffer separating the use of the Territory and the adjacent land remaining within the township.

SECTION 3: The Clerk is hereby directed to forward a certified copy of this resolution to the Board of County Commissioners of Butler County, Ohio.

SECTION 4: This resolution shall take effect at the earliest date allowed by law.

Kate Rousmaniere
MAYOR

ADOPTED: May 7, 2019

ATTEST: MaryAnn Eaton
CLERK OF OXFORD CITY COUNCIL

INTRODUCED BY: KATE ROUSMANIERE

PREPARED BY: LAW (STAFF)

EXHIBIT 'B'

Date: January 25, 2019

Description: 148.258 Acres
Annexation

Location: Oxford Township
Butler County County, Ohio

Situated in the State of Ohio, Congress Lands West of the Miami River and being 148.258 acres of land in Part of Lot #1 and Lot #2 located in Section 29, Town 5, Range 1 East, Oxford Township, Butler County, Ohio and Part of Lot #6 located in Section 28, Town 5, Range 1 East, Oxford Township, Butler County, Ohio and being the lands of The President and Trustees of the Miami University as recorded in Deed Book 357, Page 443 (Part of Lot #1 and Part of Lot #2), Deed Book 358, Page 44 (Part of Lot #2) and Official Record 6382, Page 1455 (Part of Lot #6) and Official Record 6538, Page 2300 (Part of Lot #6) of the Butler County, Ohio Recorder's Office and being further described as follows;

Beginning at the northeast corner of said Section 29 and being the northwest corner of said Section 28 and being the **True Point of Beginning**;

thence, leaving the northeast corner of said Section 29 and with the northerly of said Section 28, South 87° 51' 08" East, 587.89 feet to the northwest corner of Lot #3436 and being the lands of City of Oxford, Ohio as recorded in Official Record 6270, Page 477 of the Butler County, Ohio Recorder's Office;

thence, leaving the northerly line of said Section 28 and with the northerly boundary of said Lot #3436, South 49° 52' 38" West, 801.14 feet to the westerly boundary of said Lot #3436 and being the westerly boundary of Lot #6;

thence, leaving the northerly boundary of said Lot #3436 and with the westerly boundary of said Lot #3436 and with the westerly boundary of said Lot #6, South 02° 40' 22" West, 1404.31 feet to the northeast corner of Lot #3437 and being the lands of City of Oxford, Ohio as recorded in Official Record 6282, Page 1455 of the Butler County, Ohio Recorder's Office;

thence, leaving the westerly boundary of said Lot #3436 and the westerly boundary of said Lot #6 and with the northerly boundary extended of said Lot #3437 and with the northerly boundary of Lot #3438 and being the lands of City of Oxford, Ohio as recorded in Official Record 6538, Page 2298 of the Butler County, Ohio Recorder's Office, North 87° 19' 38" West, 100.00 feet to the northwest corner of said Lot #3438;

thence, leaving the northerly boundary of said Lot #3438 and with the westerly boundary of said Lot #3438, South 02° 40' 22" West, 696.00 feet to the southerly boundary of said Lot #2;

thence, leaving the southerly boundary of said Lot #2 and continuing the westerly boundary of said Lot #3438, South 02° 28' 08" West, 894.37 feet to the centerline of Brookville Road;

thence, leaving the westerly boundary of said Lot #3438 and with the centerline of said Brookville Road for the following three courses:

1) South 84° 00' 05" West, 98.86 feet;
2) South 83° 07' 35" West, 1558.01 feet;

6900 Tylersville Road, Suite A
Mason, OH 45040
513-336-6600

110 South College Ave, Suite 101
Oxford, OH 45056
513-523-4270

1404 Race Street, Suite 204
Cincinnati, OH 45202
513-834-6151

209 Grandview Drive
Fort Mitchell, KY 41017
859-261-1113

http://www.bayerbecker.com

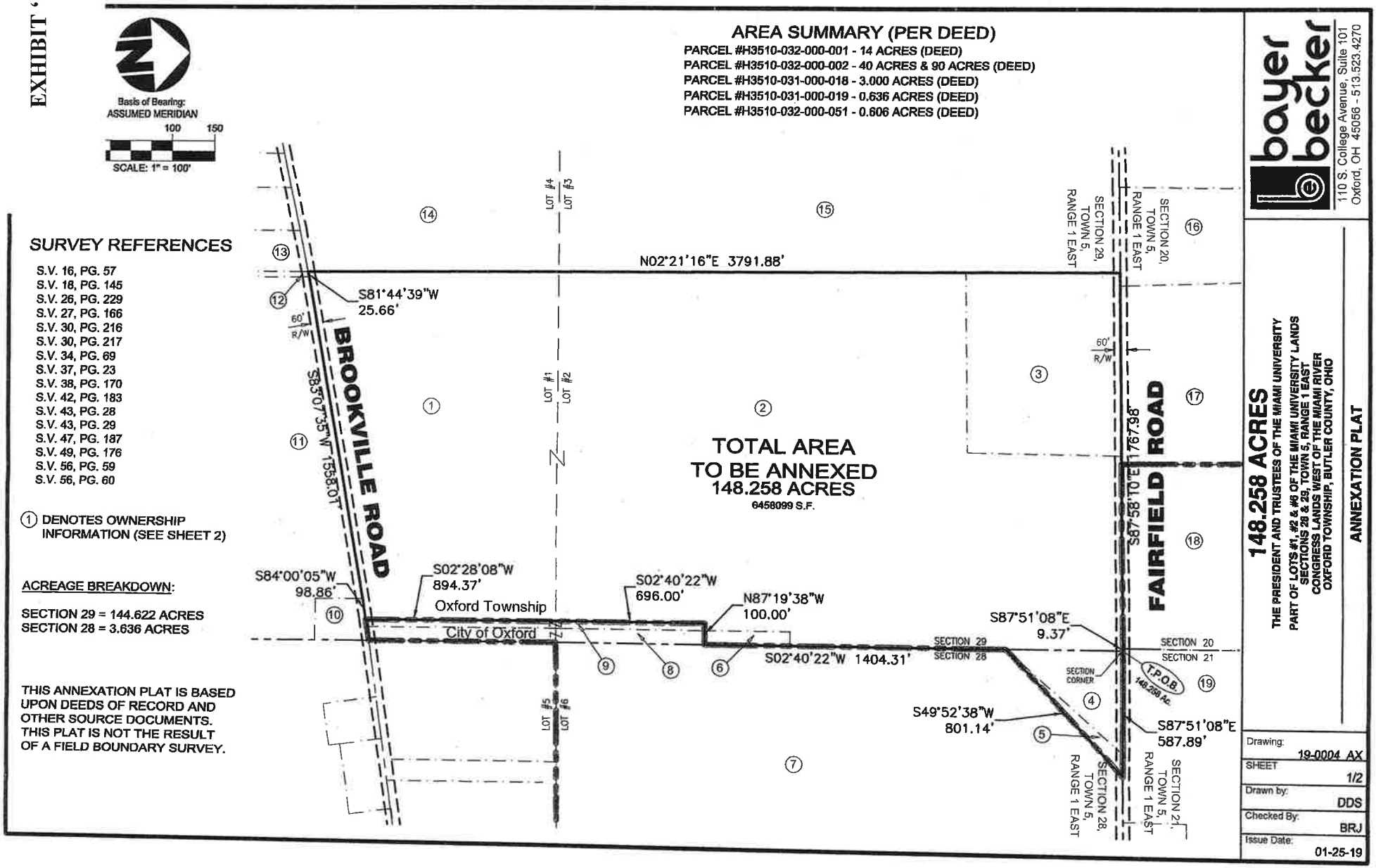
3) South 81° 44' 39" West, 25.66 feet to the easterly boundary of Lot #4 and being the southeast corner of the lands of The President and Trustees of the Miami University as recorded in Deed Book 358, Page 161 of the Butler County, Ohio Recorder's Office;

thence, leaving the centerline of said Brookville Road and with the easterly boundary of said Lot #4 and with the easterly boundary of Lot #3 and being the lands of Miami University as recorded in Deed Book 357, Page 528 of the Butler County, Ohio Recorder's Office, North 02° 21' 16" East, 3791.88 feet to the southerly line of said Section 29 and being the northeast corner of the lands of The President and Trustees of the Miami University as recorded in Deed Book 357, Page 528 of the Butler County, Ohio Recorder's Office;

thence, leaving the easterly boundary of said Lot #3 and with the southerly line of said Section 29, South 87° 58' 10" East, 1767.98 feet to the southwest corner of Lot #3231 and being the lands of Southwestern Ohio Seniors' Services, Inc., as recorded in Official Record 5417, Page 467 of the Butler County, Ohio Recorder's Office;

thence, leaving the southwest corner of said Lot #3231 and with the northerly line of said Section 29, South 87° 51' 08" East, 9.37 feet to the **True Point of Beginning,** containing 6,458,099 square feet or 148.258 acres of land more or less of which 3.636 acres of land are located in Section 28 and 144.622 acres of land are located in Section 29 and being subject to all easements, legal highways, restrictions and rights-of-way of record.

EXHIBIT 'C'



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110 S. College Avenue, Suite 101
Oxford, OH 45056 - 513.523.4270

148.258 ACRES

THE PRESIDENT AND TRUSTEES OF THE MIAMI UNIVERSITY
PART OF LOTS #1, #2 & #3 OF THE MIAMI UNIVERSITY LANDS
SECTIONS 28 & 29, TOWN 5, RANGE 1 EAST
CONGRESS LANDS WEST OF THE MIAMI RIVER
OXFORD TOWNSHIP, BUTLER COUNTY, OHIO

ANNEXATION PLAT

Drawing:	19-0004 AX
SHEET	1/2
Drawn by:	DDS
Checked By:	BRJ
Issue Date:	01-25-19

OWNER INFORMATION

① PART OF LOT #1
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
D.B. 357, PAGE 443 (40 ACRES DEED)
PARCEL #H3510-032-000-002

② PART OF LOT #2
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
D.B. 357, PAGE 443 (90 ACRES DEED)
PARCEL #H3510-032-000-002

③ PART OF LOT #2
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
D.B. 358, PAGE 44 (14 ACRES DEED)
PARCEL #H3510-032-000-001

④ PART OF LOT #6
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
O.R. 6382, PAGE 1455 (3.00 ACRES DEED)
PARCEL #H3510-031-000-018

⑤ PART OF LOT #6
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
O.R. 6538, PAGE 2300 (0.636 ACRES DEED)
PARCEL #H3510-031-000-019

⑥ PART OF LOT #2
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
O.R. 6538, PAGE 2300 (0.606 ACRES DEED)
PARCEL #H3510-032-000-051

⑦ LOT #3436
CITY OF OXFORD, OHIO
O.R. 6270, PG. 477 (110.044 ACRES DEED)
PARCEL #H4000-141-000-001

⑧ LOT #3437
CITY OF OXFORD, OHIO
O.R. 6282, PAGE 1455 (3.00 ACRES DEED)
PARCEL #H4000-141-000-003

⑨ LOT #3438
CITY OF OXFORD, OHIO
O.R. 6538, PAGE 2298 (1.239 ACRES DEED)
PARCEL #H4000-141-000-004

⑩ PART OF LOT #1
BOWLING ESTATES LTD.
O.R. 6017, PG. 146 (1.073 ACRES DEED)
PARCEL #H3510-032-000-040

⑪ PART OF LOT #1
BOWLING ESTATES LTD.
O.R. 6017, PG. 157 (65.697 ACRES DEED)
PARCEL #H3510-032-000-003

⑫ PART OF LOT #1
JOSEPH S. HESSELBROCK TR.
AND LARRY J. HESSELBROCK TR.
O.R. 9064, PG. 1706 (TRACT XIII)
(0.902 ACRES DEED)
PARCEL #H3510-032-000-026

⑬ PART OF LOT #4
THOMAS E. AND KAREN L. RUPP TRS.
O.R. 6831, PG. 878 (15.655 ACRES)
PARCEL #H3510-032-000-004

⑭ PART OF LOT #4
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
D.B. 358, PAGE 161 (25.700 ACRES DEED)
PARCEL #H3510-032-000-005

⑮ PART OF LOT #3
THE PRESIDENT AND TRUSTEES
OF THE MIAMI UNIIVERSITY
D.B. 357, PAGE 528 (100.24 ACRES DEED)
PARCEL #H3510-032-000-007

⑯ PART OF LOT #4
JACK F. AND KAREN S. GROVE
D.B. 1616, PG. 599 (8.005 ACRES DEED)
PARCEL #H3510-020-000-010

⑰ PART OF LOT #1
JACK F. AND KAREN S. GROVE
D.B. 1592, PG. 467 (106.745 ACRES DEED)
PARCEL #H3510-020-000-008

⑱ LOT #3723
GARY M. PAULIN TR. ETAL
O.R. 8627 PG. 999
PARCEL #H4100-039-000-001

⑲ LOT #3231
SOUTHWESTERN OHIO SENIORS' SERVICES, INC.
O.R. 5417 PG. 467
PARCEL #H4100-022-000-025

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PART OF LOTS #1, #2 & #6 OF THE MIAMI UNIVERSITY LANDS
SECTIONS 28 & 29, TOWN 5, RANGE 1 EAST
CONGRESS LANDS WEST OF THE MIAMI RIVER
OXFORD TOWNSHIP, BUTLER COUNTY, OHIO

ANNEXATION PLAT

Drawing:	19-0004 AX
SHEET	2/2
Drawn by:	DDS
Checked By:	BRJ
Issue Date:	01-25-19

A regular meeting of the Oxford City Council was called to order by Mayor Kate Rousmaniere on Tuesday, August 6, 2019 at 7:00 p.m. Those members present were Steve Dana, Glenn Ellerbe, David Prytherch, and Mike Smith. Chantel Raghu arrived at 7:01 p.m. and Edna Southard was excused.

Staff members present: Mr. Doug Elliott, City Manager; Mr. Mike Dreisbach, Service Director; Mr. John Jones, Police Chief; Mr. Joe Newlin, Finance Director; Ms. Jessica Greene, Assistant City Manager; Casey Wooddell, Parks & Recreation Director; Mr. Alan Kyger, Economic Development Director; Mr. John Detherage, Fire Chief; Mr. Chris Conard, Acting Law Director and Ms. Mary Ann Eaton, Clerk of Council.

ADJOURN TO EXECUTIVE SESSION

Mr. Smith moved to adjourn to Executive Session immediately in accordance with Ohio Revised Code Section 121.22(G)(1) for the purpose of discussing the appointment of a Public Official. Mr. Dana seconded. The motion passed by the following roll call:

AYE: Mr. Ellerbe, Mr. Prytherch, Mr. Smith, Mr. Dana, Mayor Rousmaniere (5)

NAY: None (0)

ABS: None (0)

ADJOURN FROM EXECUTIVE SESSION

Mr. Dana moved to adjourn from Executive Session at 7:30 p.m. Mr. Smith seconded. The motion passed 6-0-0.

PLEDGE OF ALLEGIANCE

Mayor Rousmaniere requested the Pledge of Allegiance.

APPROVAL OF AGENDA

Mr. Dana moved to approve the agenda. Mr. Smith seconded. The motion passed 6-0-0.

PUBLIC PARTICIPATION

PUBLIC COMMENTS

Ms. Prue Dana, 131 W. Collins Street, stated she was speaking this evening to call attention to the perilous times in which we live noting Dayton, Ohio is not too far away. Ms. Dana advised she was born and raised on E. 5th Street, next to the Oregon District. Ms. Dana noted we need to acknowledge what is happening and continue working together for the good of the whole community of Oxford, Ohio in combination with Miami University. Ms. Dana thanked Council for spending time to create a caring community here in Oxford.

Mr. David Brown, Butler County Auditor's Office, advised local governments that receive advances on tax settlements would receive the second advance later this week.

Mr. Brown noted the County's new financial reports were published noting he had the Popular Annual Financial Report (PAFR) with him and advised he would leave a few copies for those interested in reading it. Mr. Brown noted the PAFR and CAFR were posted on the County's website.

Mr. Brown advised work on fuel quality testing continues within the Auditor's Office noting Auditor Reynolds is advocating for a change in State Law whereby the Auditor's Weights and Measures personnel could test fuel for water, sediment or octane level while they are doing their duty of checking pumps for accuracy in the amount of fuel they are dispensing.

Mr. Brown advised the Auditor's Office has not found any skimmers in Butler County since last September noting there had been an arrest which was big news. Mr. Brown noted the FBI had some ideas of who might have put skimmers in gas pumps in Fairfield and in Hamilton County. Mr. Brown advised the FBI made an arrest in June in Louisville noting the person was a Cuban national. Mr. Brown noted when he came into the country he applied for asylum and was fingerprinted which helped to identify him as the perpetrator along with the video from Butler County. Mr. Brown advised the entire press release was posted on the Auditor's website.

Mayor Rousmaniere noted in the past Mr. Brown encouraged people to look for pumps with a certain sticker on them before fueling and inquired if that was still the case because she does not always see them. Mr. Brown explained a lot of gas stations have gone away from that because the pumps have newer technology. Mr. Brown advised the newer pumps are not accessible for any kind of tampering.

Ms. Raghu referred to a flyer regarding the arrest of the person placing skimmers in gas pumps and noted people found it offensive that his ethnicity was listed. Ms. Raghu inquired what the rationale was for listing his ethnicity. Mr. Brown noted the assumption all along was that a gang was moving through and was responsible for the crimes. Mr. Brown advised the Auditor's Office had heard they were Cuban nationals from the beginning. Mr. Brown noted this was a way to show it was not someone local and that it was an affiliation which goes along with what the authorities told the Auditor's Office 2-3 years ago. Ms. Raghu noted she felt it was offensive and suggested in future announcements that ethnicity information be withheld. Ms. Raghu advised she understood when looking for a suspect that descriptive terms would be needed and noted in this situation the person had already been located. Ms. Raghu reiterated she felt it was offensive. Mr. Brown stated he was sorry Ms. Raghu saw it that way noting the Auditor's Office reported the evidence as they found it.

CONSENT AGENDA

MINUTES

Minutes of the July 16, 2019 City Council Meeting. (Mary Ann Eaton, Clerk of Council)

REPORT

Report regarding the July 17, 2019 Board of Zoning Appeals Meeting. (Sam Perry, Community Development Director)

RESOLUTION
AGREEMENT WITH BUTLER COUNTY

A Resolution No. 7092 authorizing the City Manager to enter into an agreement of cooperation with Butler County, Ohio, pursuant to the provisions of the Housing and Community Development Act of 1974, as amended. (Kim Newton, Assistant to the City Manager)

Mr. Dana moved to approve the consent agenda. Mr. Smith seconded. The motion passed 6-0-0.

RESOLUTIONS

RESOLUTION
SUPPORTING A CLEAN OHIO
GRANT APPLICATION

A Resolution No. 7093 in support of Miami University's Clean Ohio Green Space Conservation Grant application for the restoration of Four Mile Creek. (Mike Dreisbach, Service Director)

Mayor Rousmaniere, Mr. Prytherch, Mr. Smith and Mr. Ellerbe recused themselves as employees of Miami University.

Mr. Dreisbach advised in the vicinity of the equestrian stables at Miami University there was significant erosion along the stream corridor. Ms. Dreisbach noted approximately 350 feet of area by the stables is eroding and advised Miami University was applying for a grant from the Clean Ohio Green Space Conservation fund to restore the area in question. Mr. Dreisbach noted this was beneficial to the City because the work would likely have to be done as part of the OAT's trail improvements and advised the City was not competing with Miami University for the grant. Mr. Dreisbach noted a Resolution of support from the municipality was required with Miami's grant application and asked for Council's approval of the proposed Resolution.

Vice Mayor Dana inquired if there were any comments from the public and there were none.

Mr. Dana noted his support of the proposed Resolution as it addresses the Oxford Area Trail System, the Equestrian Center and all of the environmental issues that lie at the base of this plan.

Ms. Raghu moved to adopt Resolution No. 7093. Mr. Dana seconded. The motion passed 2-0-0.

Mr. Conard advised former Law Director Steve McHugh obtained an ethics opinion on August 15, 2018 and the question poised involved grant funding for road work.

Mr. Conard noted the summary of the ethics opinion indicated that City Council members employed by the university are prohibited from participating in matters before Council that definitely and directly affect the university. Mr. Conard advised the Resolution regarding a Miami University grant application could fall into that category and therefore in his role as Acting Law Director he recommended those members of Council recuse themselves in an abundance of caution because the City of Oxford wants to maintain the highest ethical standards possible.

RESOLUTION
SUPPORTING ODOT'S BRIDGE
INSPECTION PROGRAM

A Resolution No. 7094 in support of the Ohio Department of Transportation's Bridge Inspection Program (PID#109334) and authorizing the City Manager to sign all agreements necessary for the City to participate in the program. (Mike Dreisbach, Service Director)

Mr. Dreisbach advised ODOT was offering Oxford being a community of less than 50,000 persons a Bridge Inspection Program at no cost to the City. Mr. Dreisbach noted ODOT was willing to spend 100% of the cost to inspect all of Oxford's bridges and culverts and advised the City would be responsible for the local costs including maintenance and repair. Mr. Dreisbach noted the proposed program would save the City approximately $7,000 per year and recommended Council approve the Resolution.

Mayor Rousmaniere inquired if there were any comments from the public and there were none.

Mr. Dana inquired if this program would affect the Black Covered Bridge and if not why. Mr. Dreisbach advised the program would not affect the Black Covered Bridge because vehicles were specifically prohibited from it. Mr. Dreisbach noted the program was for vehicular bridges.

Mr. Prytherch noted the county was responsible for any county bridges within the City limits.

Mr. Dana moved to adopt Resolution No. 7094. Mr. Smith seconded. The motion passed 6-0-0.

ORDINANCES
FIRST READING

ORDINANCE
ANNEXATION OF 148.258 ACRES

An Ordinance Accepting The Annexation Petition From Douglas R. Elliott, Jr. For 148.258 Acres Of Land In The Township Of Oxford, Butler County Ohio, And Accepting Said Territory To Be Annexed. (Doug Elliott, City Manager)

Mr. Elliott advised Miami University and the City of Oxford submitted an annexation petition to the Butler County Commissioners on April 19, 2019. Mr. Elliott noted the petition proposed to annex five parcels of land totaling 148.3 acres off of Fairfield and Brookville Roads next to the Oxford Community Park.

Mr. Elliott advised the primary reason for the annexation is to enable the City to lower the speed limit and to consider other improvements for pedestrian and driver safety near the entrance to the Oxford Community Park off of Fairfield Road. Mr. Elliott noted he served as the agent for the petitioner and advised the County Commissioners approved the annexation on May 20th. Mr. Elliott noted the last step in the process was for Council to adopt an Ordinance accepting the annexation. Mr. Elliott offered to answer any questions.

Mayor Rousmaniere inquired if there were any comments from the public and there were none.

Mayor Rousmaniere inquired if the City was annexing from the township or from Miami University and Mr. Elliott advised the land was in the township. Mayor Rousmaniere inquired if the land would still be owned by Miami University and Mr. Elliott advised yes. Mayor Rousmaniere asked Mr. Elliott to remind everyone what the process was for an Expedited Type II Annexation. Mr. Elliott advised an Expedited Type II Annexation requires all of the property owners to sign the petition noting if it was processed properly the County Commissioners must approve it. Mr. Elliott advised there was no provision for objections to the annexation under the expedited process unless it was not filed properly. Mr. Elliott noted in this case since the Miami University property is tax exempt there would be no loss of revenue to the township. Mr. Elliott reiterated the reason for the annexation was to lower the speed limit and to make other safety improvements in the vicinity of the Oxford Community Park. Mr. Elliott noted some of the improvements such as pedestrian crossings and flashing lights have already been installed.

Mr. Dana noted all of the improvements that will flow from this annexation, lower speed limit, pedestrian and cyclist safety are timely considering the traffic to and from the aquatic center. Mr. Dana advised this was a good example of "Complete Streets" in action because it addresses the needs of people with varied mobility.

Mr. Prytherch noted his support of the annexation and of the reduced speed limit. Mr. Prytherch noted when the City embarks on annexations in the future he hoped Council would consider them in terms of the Comprehensive Plan.

ORDINANCE
SUPPLEMENTAL BUDGET

An Ordinance Amending Ordinance No. 3493. Supplemental Budget Ordinance Number 7 To Make Supplemental Appropriations For Fiscal Year 2019. (Joe Newlin, Finance Director)

Mr. Newlin advised the Supplemental Budget consisted of an adjustment to the Water Improvement Fund from the unencumbered balance of $90,000. Mr. Newlin noted the sole water main serving Springwood Subdivision on SR 73 is not in the public right-of-way or in a utility easement. Mr. Newlin advised the attorney for the private property owner has asked the City to abandon the water main as it sits adjacent to the homes foundation. Mr. Newlin noted City staff has designed a new water main that will be installed by City crews later this year after permitting is complete from the Ohio EPA, the Ohio Department of Transportation and the Butler County Engineer's Office.

Mayor Rousmaniere inquired if there were any comments from the public and there were none.

Mr. Prytherch asked for further explanation of the water main itself. Mr. Dreisbach advised decades ago when the water main was extended to serve Springwood the developer and the City approved going outside of the right-of-way to come into one of the cul-de-sacs in Springwood. Mr. Dreisbach noted he assumed it was to save money at the time. Mr. Dreisbach advised the private property owner was digging a foundation and the City was fortunate that their backhoe only ran against the water main and did not damage it noting it was the only water main serving the entire subdivision. Mr. Dreisbach advised it was prudent for City crews to move the water main to a protected space in the SR 73 right-of-way noting there was an unanticipated expense of $90,000 for the materials.

ANNOUNCEMENTS

Mr. Elliott reminded everyone of the CIP Work Session scheduled for Monday, August 19 at 7:00 p.m. noting staff was finalizing the CIP and would send it to Council on Thursday of this week.

Mr. Elliott reminded everyone of the Community Picnic on Thursday, August 29 noting an Open House for the new Police Station would also take place that evening. Mr. Elliott advised a Ribbon Cutting with Council members was planned for 5:30 p.m.

Mr. Wooddell noted the Parks and Recreation Department was hosting a "Back to School Bash" on Sunday, August 11th at the Aquatic Center. Mr. Wooddell advised a lot of community partners were on board noting at the event from 5-9 p.m. Great Clips would provide free hair cuts, Primary Health Solutions would provide free dental screenings, Crossroads Church and the Talawanda School District would provide free school supplies and back to school forms. Mr. Wooddell noted Police and Fire staff would be on site including the School Resource Officers. Mr. Wooddell advised free food would be available on site as well. Mr. Wooddell noted there was a special event fee to get into the Aquatic Center for that evening and advised everything else he just mentioned was free and would be outside of the Aquatic Center gates. Mayor Rousmaniere noted games and inflatables would also be set-up outside of the gates.

Mr. Ellerbe inquired if the Family Resource Center had been notified of this event noting a lot of the free services would be of great use to some of their clients. Mayor Rousmaniere advised the Coalition for a Healthy Community sent flyers to the Family Resource Center.

Mr. Wooddell noted there was some concern with the pool admission not being free that evening and advised a private donor reached out to him and offered to pay the admission for 50 children. Mr. Wooddell noted staff would work with the Police Department including the School Resource Officers to identify which children might be appropriate to receive the free admission. Mr. Dana asked Mr. Wooddell to try to target children who used to walk to the former pool and do not have the means to get to the new Aquatic Center.

Ms. Raghu read the names and age of those who were killed in Dayton last weekend as follows: Megan Betts, 22; Monica Brickhouse, 39; Nicholas Cumer, 25; Derrick Fudge, 57; Thomas McNichols, 25; Lois Oglesby, 27; Saeed Saleh, 38; Logan Turner, 30; and Beatrice Warren-Curtis, 36.

Ms. Raghu stated that Dayton was so close to home and noted she felt Council members can feel helpless especially as citizens. Ms. Raghu advised she felt Council members were in a position to feel less helpless. Ms. Raghu inquired what Council can do from a local perspective and suggested adopting a Resolution endorsing Red Flag laws as requested by a citizen some time ago. Ms. Raghu noted the City of Cincinnati passed a ban on bump stocks. Ms. Raghu suggested Council encourage the State of Ohio to increase the purchasing age of weapons that are typically used by the military. Ms. Raghu advised she felt Council needed to face their helplessness and do something about it. Ms. Raghu encouraged Council in the upcoming meetings to endorse gun control measures.

Mr. Ellerbe noted this Saturday was one of his favorite days of the year and advised the Red Brick Reunion Porsche show would take place in Uptown Oxford. Mr. Ellerbe noted a whole bunch of really sweet rides come into town and create a rolling art exhibit. Mr. Ellerbe advised he would be there as soon as he possibly could and noted his hope the rest of Council would be there too. Mr. Ellerbe noted the show opens at 9:00 a.m., judging is at 10:00, a lunch break at noon, closing ceremonies at 2:00, a Porsche parade and the event ends at 4:00 p.m.

Mr. Ellerbe advised Butler County has a "Secret Shake Society" and recommended everyone go to the Butler County Visitor's Bureau and check out how to become a member. Mr. Ellerbe noted restaurants and ice cream vendors have a special shake and advised if you are a member of the Secret Shake Society you can get an extremely fancy shake for a special price.

Mr. Dana referred to an upcoming report from the Community Development Department on Oxford Housing Affordability noting he looked forward to receiving it. Mr. Dana noted the Community Development Department was also working on an Oxford Transportation Plan noting he felt it would be beneficial to have such a plan and he looked forward to it greatly.

Mr. Dana noted his hope Logan Keebler will always be remembered. Mayor Rousmaniere offered many condolences to the Keebler family.

Mr. Smith advised an Oxford favorite, John Kogge & the Lonesome Strangers would play at the Uptown Music Festival this week noting the weather looked great and he hoped to see everyone there.

Mr. Prytherch advised a business advisory group which includes representatives from the Chamber of Commerce, Enjoy Oxford, Councilors and Mayor Rousmaniere was formed. Mr. Prytherch noted the group has been meeting to tackle some of the issues in terms of the vibrancy and diversity of Uptown businesses. Mr. Prytherch advised the group was interested in creating a Business Improvement District in Uptown Oxford. Mr. Prytherch encouraged everyone to look for more on that in September.

Mr. Prytherch noted the Climate Action Task Force has been meeting weekly with a goal of moving relatively quickly towards a recommendation on the feasibility of making a climate commitment. Mr. Prytherch advised the group including City staff has researched 30 plus communities close to Oxford's size that have made a climate commitment focusing on best practices and trying to do an institutional analysis. Mr. Prytherch noted the group was nearing a recommendation and a presentation to Council to discuss what making the climate commitment would mean.

Mr. Prytherch advised he would bring forward Complete Streets as a Resolution and an Ordinance noting he looked forward to working with staff and the Clerk on the best way to do that.

Mr. Prytherch referred to Ms. Raghu's comments noting one does feel powerless in part because cities have no power to deal with the immediate causes of gun violence. Mr. Prytherch noted the legislature has taken away the ability of localities to do anything about firearms what so ever and yet the legislature has not confronted the issues.

Chief Jones advised he prepared comments to address this issue. Chief Jones noted he felt there were some things Council could do that Council may not be thinking about right now. Chief Jones advised the tragedy in Dayton was mitigated by the quick response and heroic actions of 6 Dayton Police Officers who were already in the area when the shooting took place. Chief Jones noted they did not have to wait on a 911 call to respond, they were right there, 6 Police Officers, and that is just the ones who fired back. Chief Jones advised heavy Police presence allowed for immediate response that saved many lives. Chief Jones noted while many in our community have probably thought this is something that can never happen here in Oxford he has thought about it for years as a Police Officer and the Oxford Police Officers know the vulnerability we have in this town, noting it could happen anywhere. Chief Jones advised OPD has responded to "shots fired" calls in the bars Uptown and fortunately no one was hit although it was a very chaotic scene to sort out. Chief Jones noted his fear was something like this would happen and there would not be officers in the immediate area. Chief Jones advised clearly on Uptown weekend nights we do have a lot of officers and try to flood the area with foot patrol, bike patrol and vehicle patrol noting there were nights officers were in vehicles and were not in the Uptown area. Chief Jones noted staffing is limited, calls pull officers elsewhere in the City and advised OPD relies on the staff at the bars to call them for problems. Chief Jones advised OPD works well with the bar security noting they do a good job of stopping fights and removing people from the bar reminding everyone that their staff is unarmed. Chief Jones asked Council to keep that in mind as they enter into budget discussions and to think about what is important, some of the new programs or is it public safety issues, and do we have the staffing we need. Chief Jones advised he was meeting with the owner of Brick Street next week to conduct a vulnerability assessment at his facility noting he would reach out to the other establishments to see if they are interested as well. Mayor Rousmaniere inquired what a vulnerability assessment entailed. Chief Jones advised staff looks at their business practices and their facility to determine what areas can be improved and made safer. Chief Jones noted these assessments have been made at the schools, churches and businesses in the community. Chief Jones advised OPD was putting together some refresher training for the Municipal Building staff on responding to an active threat noting they were willing to work with other groups just as they work with church groups and the schools. Chief Jones advised he felt Red Flag laws were important noting law enforcement regularly comes into contact with folks who have a mental illness, drug/alcohol dependency, violent tendencies or other causes of concern that when they have access to a firearm OPD knows they are a dangerous individual but OPD was very limited in what they can do. Chief Jones noted he has argued with local prosecutors about this noting other Police Chiefs in the area agree that better policy was needed in this area. Chief Jones advised our neighbors in Indiana have Red Flag laws.

Chief Jones noted some local politicians will say the existing laws will cover the situations and advised he was currently trying to navigate a situation where OPD removed guns from an individual because of a situation they responded to and just trying to navigate through the legal process and waiting on subpoenas was a broken process. Chief Jones advised in his opinion there were areas of policy that need to be changed. Chief Jones noted he sincerely hopes and prays what happened in Dayton will never happen here and advised OPD will continue to prepare for the worst.

Mr. Dana thanked Chief Jones for his comments.

Mr. Prytherch noted he felt Council needed to be more active in asking the legislators in Columbus to do something because they have taken away any regulatory ability from local government. Mr. Prytherch referred to Enjoy Oxford's welcoming banners and noted Oxford should be a place that takes the temperature down and calls out hate. Mr. Prytherch noted in a world that is so polarized he felt Oxford does a good job as a community.

Mayor Rousmaniere inquired if a Municipal Red Flag law would hold up in court. Ms. Raghu advised the Resolution would ask the state legislature for an endorsement of a Red Flag law. Ms. Raghu noted Cincinnati passed a law banning bump stocks. Mayor Rousmaniere inquired if a law banning bump stocks would hold up in court. Mr. Conard advised he would have to research the issue noting as a general proposition the area of guns laws have been preempted by the state and there is very a limited role for Home Rule under those circumstances. Mr. Conard advised Congressman Turner is now coming out publically against assault weapons and supporting Red Flag legislation as well as the ban on large magazines.

Mr. Prytherch asked staff or anyone on Council who sees opportunities where municipalities are weighing in on legislation to share the information. Mr. Prytherch noted cities are the places where these things happen, cities have to clean up the aftermath and have very little legislative authority.

Mayor Rousmaniere noted the option was to send Resolutions to the state legislature as this Council has done on other matters. Mr. Conard encouraged Council to not ignore the representatives in Washington D.C.

Mayor Rousmaniere advised McCullough Hyde Memorial Hospital will receive the Coalition for a Healthy Community's PUSH award at the Thursday night concert this week at 7:00 p.m.

Mayor Rousmaniere noted on August 21 President Crawford is having his annual Town/Gown Reception at Lewis Place from 4-6 p.m.

Mayor Rousmaniere recapped the dates and time for Council's upcoming CIP and Budget Work Sessions.

ADJOURN

Mr. Ellerbe moved to adjourn at 8:32 p.m. Mr. Smith seconded. The motion passed 6-0-0.

MIAMI UNIVERSITY

INSTITUTE FOR THE ENVIRONMENT & SUSTAINABILITY

Professional Service Project Final Report
May 14, 2018

Climate Change Mitigation and Adaptation Strategies for the City of Oxford, Ohio:

A Feasibility Study of the Global Covenant of Mayors for Climate & Energy

Client: City of Oxford Environmental Commission

Project Team Members
Master of Environmental Science students:
Ryan Bourgart
Celeste Bronson
Page Jordan
K. Clare Quinlan
Sara Rudokas

Project Advisors:
Jonathan Levy, PhD, Director
Suzanne Zazycki, JD, Associate Director
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- AFOLU - Agriculture, Forestry, and Other Land Use
- CAP - Climate Action Plan
- CURB - Climate Action for Urban Sustainability
- EU - European Union
- GHG - Greenhouse gas
- GPC - Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
- GWP - Global Warming Potential
- ICLEI - ICLEI-Local Governments for Sustainability[1]
- IPPU - Industrial Processes & Product Use
- IES - Institute for the Environment and Sustainability
- KPI - Key Performance Indicator
- LESAC - Lafayette Energy Sustainability Advisory Committee
- LGO - Local Government Operations
- OEC - Oxford Environmental Commission
- ppm - parts per million
- UNFCCC- United Nations Framework Convention on Climate Change
- UN-Habitat - United Nations-Habitat
- USEPA - United States Environmental Protection Agency

[1] ICLEI is the original acronym for the International Council for Local Environmental Initiatives. In 2003 the organization dropped the full phrase and became "ICLEI-Local Governments for Sustainability." (ICLEI 2018a).

EXECUTIVE SUMMARY

The goal of this project was to summarize the requirements for and assess the feasibility of joining the Global Covenant of Mayors for Climate & Energy (Covenant), and explore alternative options for the City of Oxford.

Climate change encompasses variations in Earth's regional and global weather patterns. Greenhouse gases (GHGs) trap heat emitted from the Earth. The emission of GHGs by humans contributes to these changes, which include increasing global temperatures, rising sea levels, and altering weather patterns. There are two approaches to responding to climate change: mitigation and adaptation. Mitigation involves decreasing GHGs in the atmosphere to slow climate change. Adaptation involves adjusting to and preparing for predicted impacts of climate change.

The contribution of anthropogenic GHGs to climate change has spurred the development of initiatives to reduce GHGs and enhance resilience to climate change. The Covenant is an initiative that is designed to help cities around the globe measure, track, and reduce GHG emissions in response to climate change. The Covenant is structured in four phases: a public commitment to the Covenant, conducting a GHG inventory, setting targets to reduce GHG emissions, and creating a plan to mitigate emissions and adapt to climate change. These steps must be completed within three years.

Chapter 2 outlines the nuances of conducting a GHG inventory. The Covenant requires inventories to follow the Global Protocol for Community-Scale GHG Emission Inventories (GPC). There are various tools for conducting an inventory, each with unique as well as shared features. Two tools were analyzed for this project: CIRIS and ClearPath. CIRIS is strictly an inventory tool that organizes and depicts GHG data. ClearPath is a more comprehensive tool, providing assistance in each phase of the Covenant. We found evidence that conducting an inventory can take cities between 2 months to a year to complete. If done in-house using a free tool, the financial costs could be minimal, but we also found that one city paid a consultant $10,000 per year to complete one. The benefits for completing an inventory include the ability to take action to mitigate climate change, understanding sources of emission, and deciding where to focus reduction efforts.

Chapter 3 describes the process of setting targets to reduce GHG emissions, creating climate action plans (CAPs) to implement actions to meet targets, and developing climate adaptation plans to describe how cities will adjust to climate change impacts. Among other requirements, Covenant CAPs must include a political commitment, an implementation plan, and a monitoring plan. Just as there are tools for conducting an inventory, there are tools to set targets and create CAPs. Climate Action for Urban Sustainability (CURB) is a free tool that helps set targets and create a CAP. ClearPath also includes the capability to satisfy these requirements. The CAPs we reviewed took as many as two years to develop; one city hired a consultant for $50,000 to complete a CAP. Climate adaptation plans require the identification of climate hazards and a vulnerability assessment estimating the probability of climate change risks in order to recognize, evaluate, and communicate uncertainties associated with climate change.

Chapter 4 presents other opportunities for Oxford if it chooses to not sign the Covenant. Organizations such as ICLEI-Local Governments for Sustainability (ICLEI), STAR communities, C40 Cities, and the United States Environmental Protection Agency (USEPA), all offer a wide array of resources to support sustainability efforts at varying costs. This chapter also outlines free, downloadable resources that provide

step-by-step guidance for Oxford. One important finding of our research that came up consistently is the importance of community engagement for all sustainability planning efforts.

Chapter 5 outlines our recommendations. A majority of the cities that have signed the Covenant and completed its requirements are large, so we recommend that Oxford wait to sign the Covenant and revisit the feasibility of making a commitment in two years. In the interim we recommend Oxford conduct a full GHG inventory that is GPC compliant. We also recommend that Oxford begin the climate change mitigation and adaptation planning process. To help with this process we recommend engaging the community by establishing a task force.

CHAPTER 1: INTRODUCTION

This report summarizes the work conducted by a team of graduate students from Miami University's Institute for the Environment and Sustainability (IES) in partnership with the Oxford Environmental Commission (OEC). The purpose of this project was to provide the City of Oxford with a detailed summary of the Global Covenant of Mayors for Climate & Energy, as well as other actions that cities around the United States are taking to measure and manage city-level greenhouse gas emissions. The research was conducted from August 2017 to May 2018.

1.1. Background

1.1.1. Climate Change

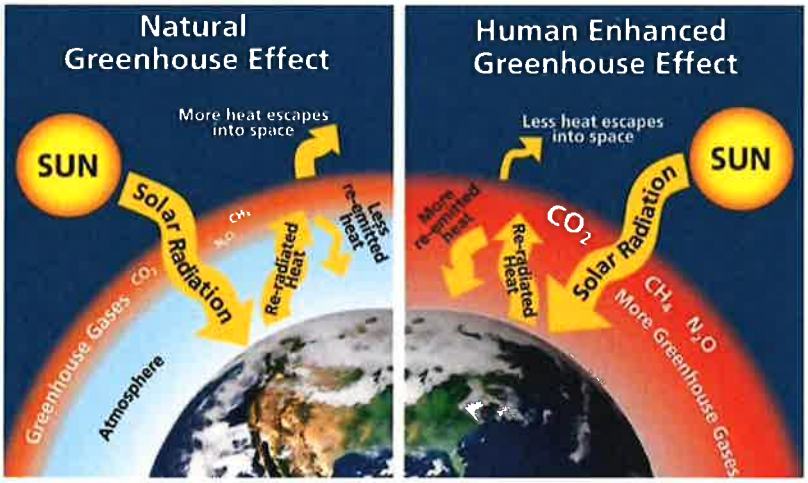


Figure 1. Left- The GHG effect occurs naturally, with gases in the atmosphere re-emitting heat to Earth and letting some heat escape into space. Right- The human enhanced greenhouse gas effect is caused by an increased concentration of GHGs in the atmosphere, which re-emit more heat and allow less heat to escape into space than under natural conditions (NPS 2018).

Climate change is any variation of Earth's regional and global annual weather patterns, such as an increase or decrease in average rainfall or temperature (NASA 2018a). While Earth's climate is always changing, most scientists agree that more recently there have been many significant changes, including rising sea levels, accelerated melting of glaciers, and shifts in plant blooming times. These changes are attributed to the rise in global temperature that has occurred in the 20th century, particularly since the late 1970's (NASA 2018a; Cook et al. 2013; CAS 2018). A main cause of this global warming is the burning of fossil fuels by humans. When coal, oil, and gas are burned, they emit greenhouse gases (GHGs), such as carbon dioxide, methane, and nitrous oxide (NASA 2018a). These gases prevent heat from escaping the atmosphere, similar to the way glass in a greenhouse holds in heat (Figure 1) (NPS 2018).

While this greenhouse effect is naturally occurring, the average global temperature rise from 1970-2015 was 1.7 °C, which is 170 times the rate normally associated with the current geologic era (Gaffney and Steffen 2017). Prior to the Industrial Revolution, carbon dioxide levels were approximately 280 parts per million (ppm). Today, carbon dioxide levels exceed 400 ppm, trapping more heat and resulting in a rising global average temperature (NASA 2018b). This rise in temperature can alter wind and weather patterns and accelerate melting of glaciers, which in turn causes sea levels to rise (NASA 2011). Approximately 43% of cities around the world are already dealing with problems presented by climate change, and virtually all cities are at risk (KPMG Advisory N.V. 2011). These problems include flooding, an increased frequency and intensity of storms, an increase in snow, and drought (C40 Cities 2012). Addressing climate change is a complex challenge that is difficult to address as it encompasses the entire planet.

1.1.2. Mitigation and Adaptation

There are two general approaches in responding to climate change: mitigation and adaptation. Mitigation involves the reduction and stabilization of GHGs in the atmosphere in an attempt to prevent or slow climate change, whereas adaptation involves adjusting to and preparing for the impacts of climate change that already happened or are expected to happen (NASA 2018b). Adaptation can involve both reducing vulnerability to the negative effects expected by climate change, as well as making the most of potential benefits that may be associated with climate change, such as longer growing seasons (NASA 2018b). Figure 2 shows the model used by the UN Intergovernmental Panel on Climate Change (IPCC) to explain the intersection between climate change risk and socioeconomic pressures.

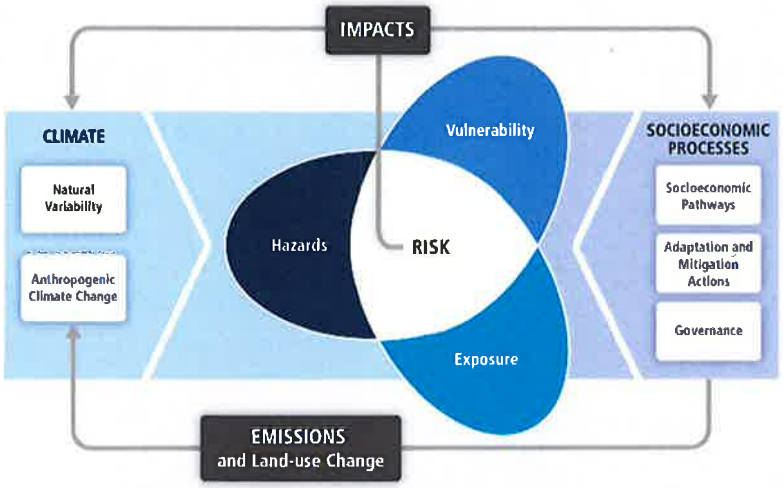
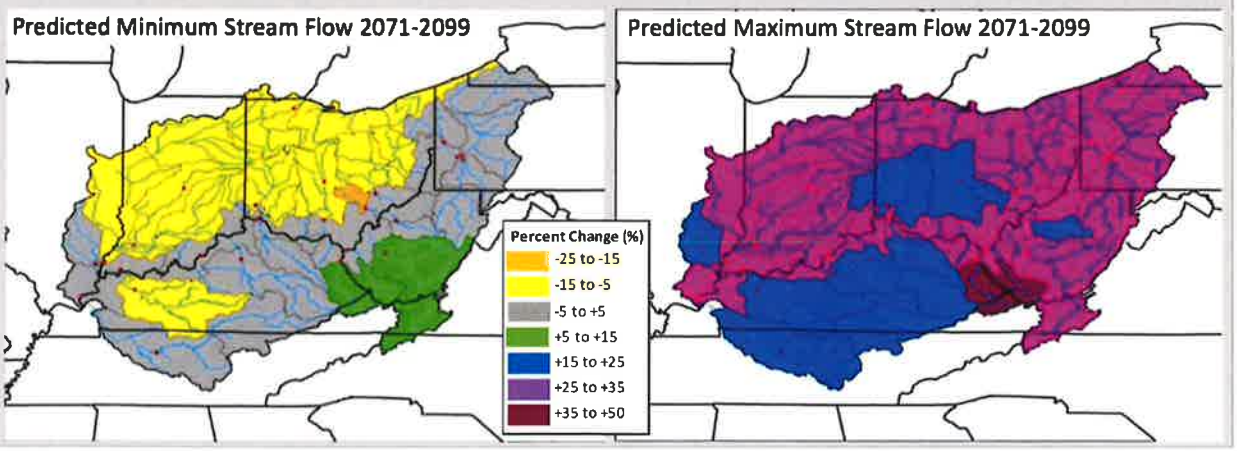


Figure 2. IPCC model showing the interaction of the climate (on the left) and socioeconomic processes (on the right) to produce climate change risk (IPCC 2014).

How will climate change impact Oxford?

The U.S. Army Corps of Engineers published a report in 2017 about how climate change is predicted to directly affect the Ohio River Basin region, which includes Butler County, and more specifically, the City of Oxford. This report found that flooding, drought, and power failures are likely going to happen more frequently and at a higher intensity. With climate change, the region is predicted to have a 7°F increase in mean annual temperature from 54°F currently to 61°F by the end of this century (US ACE and ORBA 2017). For the Oxford area, annual average maximum stream flow during March is predicted to increase by up to 25% by the end of this century, resulting from predicted stronger storm events (US ACE and ORBA 2017). Additionally, by 2099, the annual average minimum stream flow during October is predicted to decrease by up to 15%. This expansion of the stream flow spectrum and more extreme fluctuations in water levels is expected to disrupt the native flora and fauna regionally, causing harm to many species (US ACE and ORBA 2017).



On the left of the model, natural climatic variability and human-driven climate change produce climate hazards, such as increased precipitation and risk of flooding. On the right, socioeconomic factors, such as governance and mitigation actions, influence a city's vulnerability and exposure to those hazards (IPCC 2014). To address these issues, the IPCC emphasized the need for cities to minimize the hazards posed by anthropogenic climate change (through mitigation), while also reducing vulnerability and exposure to those hazards (through adaptation) (IPCC 2014).

1.1.3. History of the Covenant

The consensus that humans have contributed to climate change has spurred many community leaders to work together to reduce GHG emissions and enhance resilience to climate change. In 2008 the European Commission created the European Union (EU) Covenant of Mayors, a climate initiative designed to help local governments reduce carbon dioxide emissions by at least 40% by 2030, adapt to climate change, and address the issue of energy access. In 2014 city leaders outside the EU launched the Compact of Mayors, in which cities from around the world committed to reduce emissions city-wide, enhance resiliency of their cities, and track progress transparently (Covenant 2018c).

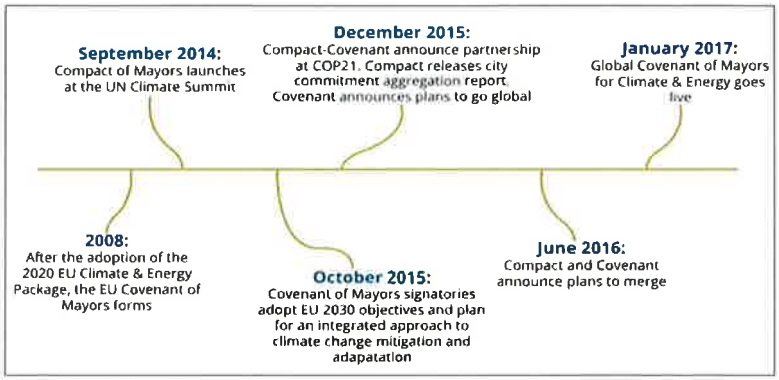


Figure 3. A visual representation of the history behind The Global Covenant of Mayors for Climate & Energy (Covenant 2018c).

In December 2015, the Paris Climate Agreement was adopted by 195 countries (European Commission 2018). This agreement stated that every country involved would work to hold the increase in global average temperature to below 2°C, and to strive to hold it below a 1.5°C increase (UN Sustainable Development 2018). Following the Paris Climate Agreement, the Compact of Mayors and EU Covenant of Mayors merged to form the Global Covenant of Mayors for Climate & Energy (hereafter referred to as the "Covenant") (Figure 3). This new Covenant is designed to help cities across the globe share a common vision to measure, track, and reduce GHG emissions as a response to climate change (Covenant 2018c). As of May 8, 2018, over 7,700 cities have signed onto the Covenant (Covenant 2018b). Of those cities, 152 are located in the United States, and 20 have populations comparable to Oxford (less than 25,000) (Covenant 2018a).

1.1.4. Overview of Covenant

The overall goal of the Covenant is to reduce GHG emissions and address current and future climate change risks. It is designed to achieve this through a four-phase process (Figure 4) (Compact of Mayors 2015a):

Phase 1: Cities publicly commit to mitigate GHG emissions and adapt to climate change.
Phase 2: Cities conduct a GHG emissions inventory, submitting partial inventories in each year.
Phase 3: By the end of year two, cities set targets to reduce GHG emissions.
Phase 4: By the end of year three, cities create plans to mitigate emissions and adapt to climate change.

Each phase of the Covenant includes steps to both mitigate emissions and adapt to climate change (Figure 4). To mitigate emissions, signatories must conduct the GHG inventory, set reduction targets and develop an action plan for meeting those targets. In order to help cities to adapt to climate change and become more resilient, signatories must first identify hazards posed to the local region by climate change, assessing the city's vulnerability to those hazards, and create a plan for how the city will adapt to the hazards.

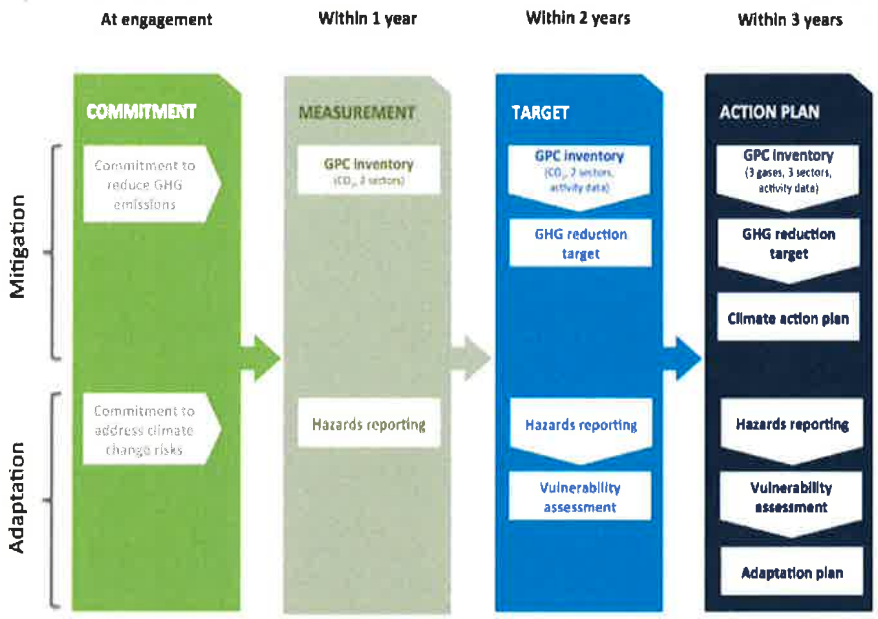


Figure 4. A summary of the phases, timeline and mitigation and adaptation requirements for the Covenant (Compact of Mayors 2015b).

The team created a two-page summary of all Covenant requirements. This is found in Appendix A.

1.1.5. Oxford's Interest in the Covenant

The Oxford Environmental Commission was curious whether it is feasible for the City to commit to the Covenant; especially whether the City has resources to satisfy the commitment within the three-year time period. The Commission was also interested in exploring alternative actions the City can take to achieve a similar goal as the Covenant.

Figure 5. Oxford is located in Butler County, in SW Ohio. Oxford indicated by a red dot (USDA 2012).

Oxford, Ohio, is a relatively small city that encompasses only 7.5 mi^2 in southwest Ohio (Figure 5). Home to Miami University, Oxford's current population is 22,000, with approximately 7,500 permanent residents and approximately 15,000 university students (City of Oxford 2010; US Census Bureau 2016; Miami University 2017; Oxford Visitors Bureau 2017). To oversee operations related to environmental and sustainability issues, the City employs one Environmental Specialist who has a wide variety of responsibilities, including ensuring the city's solid waste and stormwater management operations are in compliance with federal- and state-mandated environmental regulations, managing recycling and refuse programs, and the city street and public tree program, among many other tasks (Treleaven 2018). The client representative for this

project is the Oxford Environmental Commission. The Commission, comprised of community volunteers and one representative from City Council, is tasked with promoting environmental awareness and providing recommendations to City Council (City of Oxford 2018).

The City of Oxford has already undertaken many efforts to become a more sustainable city. Some of these practices are outlined in the City's Comprehensive Plan, adopted in 2008, and include transportation alternatives, residential green building practices, and maximizing the use of existing utilities (ACP Visioning+Planning 2008). These efforts are a high priority for the city, yet the city must balance all initiatives within the current fiscal realities. The relatively small year-round population, and similarly small number of city staff who are tasked with environmental issues must be taken into account. By examining the necessary requirements for the Covenant, as well as alternative paths to sustainability, the City of Oxford can evaluate the feasibility of taking additional steps to demonstrate its commitment to sustainable practices.

1.2. Project Description

With evidence that human-derived GHG emissions have contributed to climate change, over 7,700 cities around the world have made a commitment to track, measure, and reduce local GHG emissions by signing the Global Covenant of Mayors for Climate & Energy (Covenant 2018c). In order to evaluate if committing to the Covenant is feasible for Oxford, the City needs to understand all elements of the Covenant, including the time and labor necessary, any financial investments, and any other resources that would be needed to comply. The City also needs to understand if there are other avenues better suited for smaller college cities like Oxford that will allow them to achieve similar results as the Covenant.

The goal of this project was to summarize the requirements for and assess the feasibility of joining the Covenant, and explore alternative options for the City of Oxford. To do this the team established the following objectives:

1. Identify and summarize the specific requirements for all four phases of the Covenant.
2. Determine requirements for completing a GHG inventory, including available tools for calculating emissions, data points needed, and cost and time estimates for completion.
3. Describe the requirements for setting GHG emission reduction targets by reviewing Covenant guidelines and contacting cities to determine how they set their targets.
4. Determine requirements for completing both climate action and climate adaptation plans including outlining components of the plans, determining how other cities have written theirs, and estimating the time and cost commitment.
5. Identify alternate actions Oxford can pursue, including other climate initiatives and independent paths to sustainability, with an emphasis on examples set by similarly-sized cities.

The subsequent chapters of this report contain information about the Covenant and various alternative paths towards sustainability that may be suitable for Oxford. In Chapter 2, we discuss GHG inventories, including the data one needs to collect and the software products that are available to complete the inventory. In Chapter 3 we explain the requirements for setting GHG emission reduction targets as well as climate action and adaptation plans. In Chapter 4 we explore alternative initiatives that we discovered when exploring cities similar in size to Oxford, and in Chapter 5, we outline our recommendations for the City of Oxford.

CHAPTER 2: GREENHOUSE GAS INVENTORIES

A GHG inventory is an estimate of all GHG emissions from a specific source during a specified period of time (Krug 2015). With the results of the inventory, cities can set emission reduction targets, develop action plans, and track performance (Fong et al. 2014).

Signatories of the Covenant are required to complete a community-wide GHG inventory, which includes emissions from residential, commercial, institutional (e.g. schools, hospitals), manufacturing, and agricultural sectors (Figure 6). It is recommended that cities also conduct an inventory of local government operations (LGO), which includes emissions from public buildings and facilities, streetlights and traffic signals, water processing, government fleets, and employee commuting (Figure 6). While not required, conducting an LGO inventory can demonstrate transparency in operations and willingness to record and reduce emissions. Also, since the LGO is a sub-set of the community-wide inventory, and thus contains a smaller dataset, conducting the LGO inventory first may be useful for learning how to conduct a community-wide inventory (Fong et al. 2014).

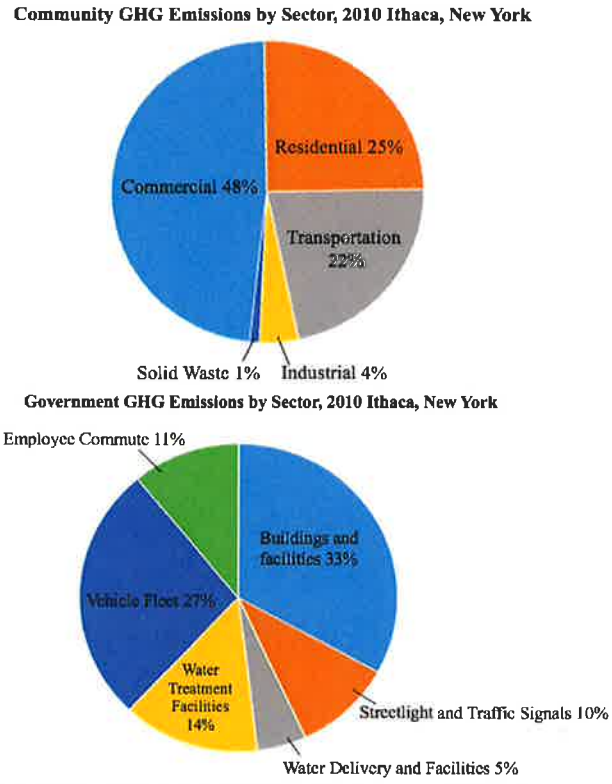


Figure 6. Ithaca, NY sources of GHG emissions as of 2010, from the (top) community and (bottom) government (Taitem Engineering P.C. & Belmaker 2013).

Covenant of Mayors for Climate and Energy GHG Requirements

Mitigation: Signatories of the Covenant are required to complete a community-wide GHG inventory using the Global Protocol for Community-Scale GHG Emissions (GPC) Standard.

Cities must determine the geographical boundary for the inventory and the year (defined as a continuous 12-month period).

Within 1 year, cities must report emissions from stationary energy and in-boundary travel and within 3 years they must also include emissions from waste. Cities are, however, strongly encouraged to report emissions from all three sectors as soon as they are able to. Additional activities are optional: transboundary travel, industrial processes and product use (IPPU), and agriculture, forestry and land use (AFOLU).

Similarly, within 1 year, cities report emissions of carbon dioxide (CO_2) and within 3 years they must also report on methane (CH_4) and nitrous oxide (N_2O). It is recommended that cities report emissions of all three GHGs as soon as the data becomes available. Additional GHGs are optional: HFCs, PFCs, SF_6 and NF_3.

A complete updated inventory is required every three years, and the inventory year may be no more than three years prior to the reporting year. Over time, the Covenant of Mayors would like cities to update their inventories on a more frequent annual basis to improve monitoring and reporting of community-wide GHG emissions.
(Source: Compact of Mayors, 2015b)

2.1. Global Protocol for Community-Scale GHG Emission Inventories

Signatories to the Covenant are required to conduct an inventory using the Global Protocol for Community (GPC) standard (Compact of Mayors 2015b). The GPC is a globally-accepted framework to identify, calculate, and report a city's GHG emissions which was created to provide more consistency and credibility in GHG reporting (Fong et al. 2014). Under the GPC, entities first define inventory boundaries, such as the geographic boundary of the area to be measured and the length of time to the target year. For example, Ithaca, NY defined the boundary for the community-wide inventory as emissions resulting from activities taking place within the city's geopolitical boundary (Taitem Engineering, P.C. & Belmaker 2013). However, the City of Aspen, CO has defined its boundary for the community-wide GHG inventory to include some residential areas outside of Aspen (Figure 7).

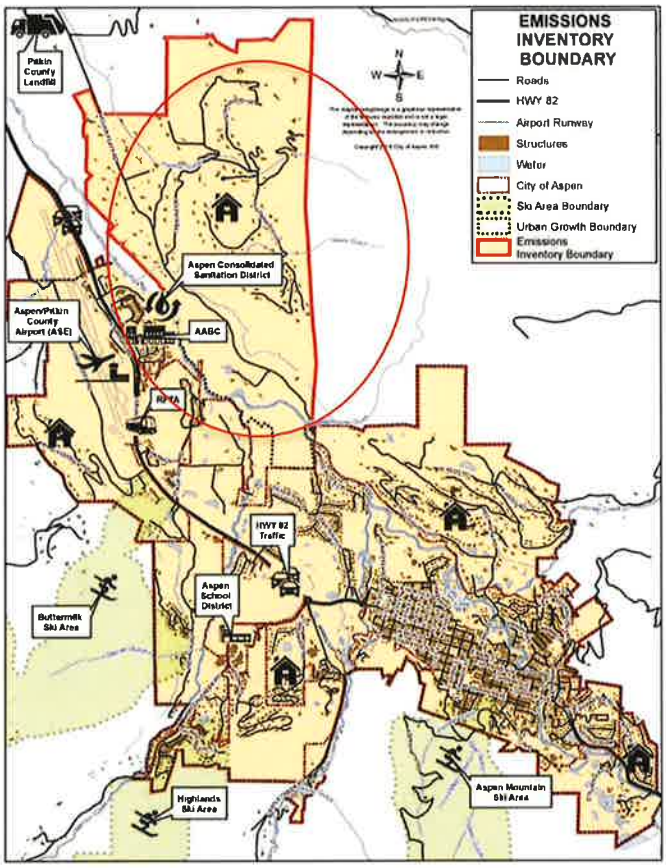


Figure 7. GHG Inventory Boundary for Aspen, Colorado. The area circled in red is outside the municipal boundaries, yet is still included in the GHG inventory (City of Aspen 2015).

To help guide data collection, the GPC classifies city activities into six sectors: stationary energy, transportation, waste and wastewater, industrial processes and product use (IPPU), and agriculture, forestry, and other land use (AFOLU). These sectors are grouped into three "scopes" based on the origin of the emission source (Figure 8). Scope 1 includes GHG emissions from sources within the city boundary, also referred to as direct emissions. This includes all of the following processes taking place within the stated boundary: stationary fuel combustion; waste and wastewater; AFOLU; transportation; and IPPU. Scope 2 includes all emissions from the grid-supplied energy. These are labeled indirect sources since they are not owned or controlled by the reporting entity. Scope 3 includes all other indirect

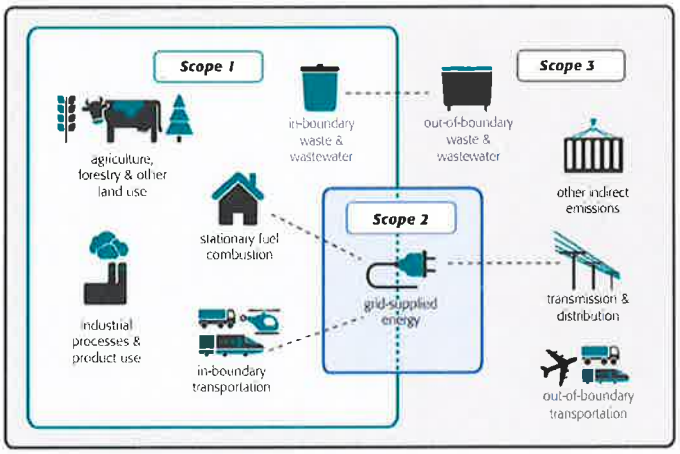


Figure 8. GPC categories for emissions defined by scopes (Fong et al. 2014).

emissions, such as out-of-boundary waste and wastewater, out-of-boundary transportation, transmission and distribution of electricity, and other indirect emissions (Fong et al. 2014).

Under the GPC, there are two levels of GHG reporting. One level, called BASIC, allows entities to only collect Scope 1 stationary energy, transportation, and waste sectors (not IPPU or AFOLU), all Scope 2 emissions, and only Scope 3 emissions from the waste sector (Figure 9). The other level, called BASIC+, requires one to collect all Scope 1 emissions, including the AFOLU and IPPU, all Scope 2 emissions, and all Scope 3 emissions (Fong et al. 2014).

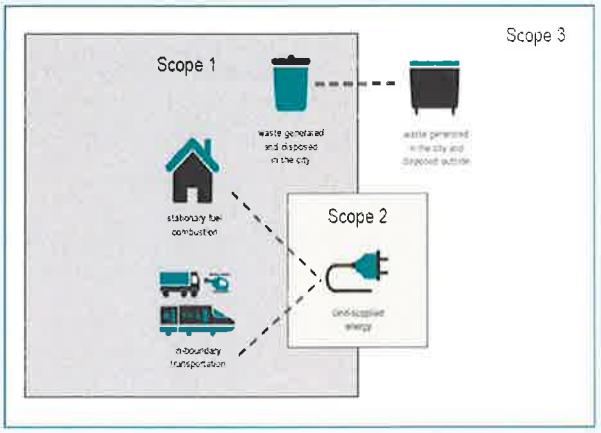


Figure 9. GPC BASIC reporting level. BASIC requires the following sectors in Scope 1: stationary fuel combustion, in-boundary transportation, and waste generated and disposed in the city. BASIC also requires scope 2 grid-supplied energy and scope 3 waste generated in the city and disposed outside (Fong et al. 2014).

These sectors and scopes set the framework for the emissions calculations. To calculate the actual emissions, a city is required to collect a wide array of data. Table 1 includes a description of each sector, as well as examples of data necessary to collect for each sector.

Table 1. Description and data examples of the six sectors of a GHG inventory as defined by the GPC (C40 Cities 2017).

Energy Sector	Description	Data Examples
Stationary Energy	• Electricity generated from fuel combustion • Indirectly by grid-supplied electricity • Fugitive emissions released from processes	• Tons of coal burned • Electricity consumed (kWh)
Transportation	• Road, rail, water, air, inter-city and international • Directly by fuel combustion • Indirectly by grid-supplied electricity	• Gasoline purchased • Miles traveled for vehicles, including cars, motorcycles, airplanes, and boats
Waste and Wastewater	• Disposal inside or outside city boundary • Disposal and treatment produce emissions through decomposition and incineration	• Solid waste at landfills • Population served by septic system • Average total nitrogen discharged (kg N/day)
Industrial Processes & Product Use (IPPU)	• Non-energy related industrial activities and products within city boundary	• Energy consumed from construction • Transportation that occurs on an industrial site • Air conditioning use
Agriculture, Forestry, and Other Land Use (AFOLU)	• Emissions from land-use changes • Digestive processes of livestock • Agricultural nutrient management	• Manure management (tons) • Fertilizer use (tons) • Crop production

2.2. Tools for Completing an Inventory

There are several online tools available as resources to help a city conduct a GHG inventory. These tools include downloadable spreadsheets that allow users to input emission data and that provide calculators to convert data. These spreadsheets commonly include the following elements:

- **Emission factors.** Emission factors convert the data that is collected for each source into a mass of GHG emissions (Fong et al. 2014). These factors are expressed as the weight of pollutant divided by a unit of weight, volume, distance, or duration of the activity emitting the pollutant (e.g., kilograms of particulate emitted per megagram of coal burned) (USEPA 2014). The software tools we examined provide specific guidance on how to account for emission factors, and also provide default emission factors that comply with GPC.
- **Global Warming Potentials (GWPs).** GWPs are used to compare the impact of individual gases on global warming, specifically the energy absorbed by one ton of gas over time (typically 100 years) (USEPA 2017). This information is embedded in the calculators as part of the emission factor (C40 Cities 2017). Cities do not need to determine the GWPs, rather the IPCC publishes new GWPs every six years and cities choose the particular version of the GWPs that they plan to use for calculations (IPCC 2014).
- **Empty cells to enter data.** Inventory tools provide blank cells to enter data. This helps the user understand what data needs to be collected, and provides a clear location for data input.
- **Data summary and visualization options.** Tools also provide either graphs or reports that summarize the data calculated, categorizing data into scopes, sectors, or by activity (Figures 10 and 11).

2.2.1. Examples of GHG Inventory Tools

The project team examined two GHG software programs, City Inventory Reporting and Information System (CIRIS) and ClearPath. Both tools follow the GPC guidelines and therefore can be used to complete the GHG inventory for the Covenant. CIRIS is free to download through an organization called C40 Cities, which supports cities in mitigating GHG emissions and adapting to climate change. In order to access the ClearPath GHG inventory tool, one would need to become a member of the organization ICLEI – Local Governments for Sustainability[2] (ICLEI). Dues are based on population, and would be $600 annually for Oxford (ICLEI 2018b). Because CIRIS is free, the project team was able to examine the tool in some detail. We also spoke with a representative from ICLEI who provided some insight into ClearPath, but we could not conduct a direct comparison. One significant difference is that CIRIS is strictly a GHG inventory tool, while ClearPath is a robust tool that helps with conducting an inventory, creating targets, and evaluating options for effective climate action decision-making.

GHG Emissions Source			Notation Keys	Activity Data		Activity Data Unit Converter		
Sub-category	Activity	Description		Amount	Unit	EF Unit	Default	Override
Emissions from fuel combustion within the city boundary								
Residential (1.A.4.b)	Please select				Please select			
Emissions from grid-supplied energy consumed within the city boundary								
Transmission and distribution losses from grid-supplied energy			NE					

Figure 10. Examples of color coded CIRIS cells. White cells indicate that the user should enter data. Gray cells are automatically calculated by the tool. Light green cells indicate data required for BASIC compliance. Light blue cells indicate data required for BASIC+ compliance (C40 Cities 2017).

[2] ICLEI is the original acronym for the International Council for Local Environmental Initiatives. In 2003 the organization dropped the full phrase and became "ICLEI-Local Governments for Sustainability" (ICLEI 2018a).

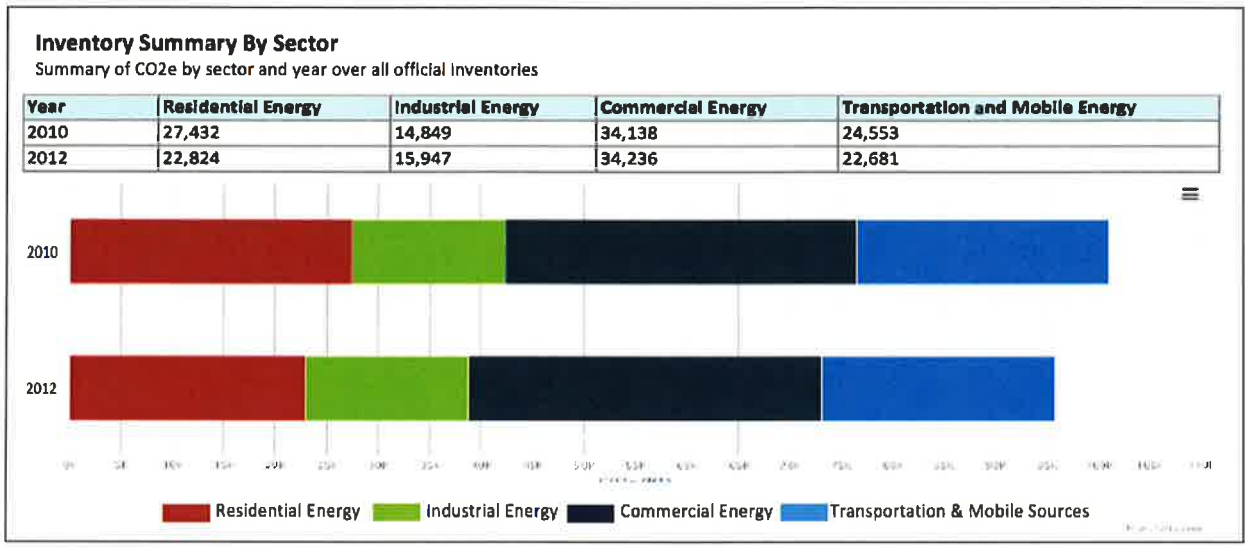


Figure 11. Inventory output summary graphic from ClearPath for two different years, divided by energy sector. ClearPath can record several inventories and produce comparative reports that contrast inventories from different years (ICLEI 2014).

2.3. Time and Cost Estimates

The amount of time it takes and the cost of conducting a GHG inventory varies depending on the resources available to the city. The team contacted 12 cities and 6 consulting firms to estimate costs and time commitments (a full list of all contacts for the project is listed in Appendix B). Only a few provided estimates. We found it could take anywhere from two months for an experienced city staff member to conduct the inventory, to nine months for a team of graduate students to complete a partial inventory. We also found that the City of Boulder paid $10,000/year to a consulting firm. Table 2 provides a more detailed summary of our findings.

Table 2. Estimated number of personnel, length of time and cost to complete a GHG inventory. The data is divided into three scenarios: hiring a consulting firm, conducting the GHG inventory in-house, or collaborating with Miami University's Institute for the Environment and Sustainability.

Number of Personnel Needed		Time	Cost
Hire Consulting Firm[1]	Consulting Firm + 1 city employee to work w/ firm	One year	$10,000/year
Conduct in-house by City employees[2 3]	1 city employee working full time on inventory[2]	2 months	$0 if use CIRIS or $600 if use ClearPath + Opportunity cost of city employee's time not working on other tasks
	1 city employee + 1 intern; working part-time[2]	4-6 months	
	Project Manager and other key personnel as needed[3]	5-8 months planning 2-4 months collecting data	
Collaboration with Miami University[4]	4 graduate students 2 Miami employees 1 city employee liaison	9 months	$0 if use CIRIS $600 for ClearPath

[1] Amount paid by Boulder, CO to LOTUS Engineering to conduct GHG inventory (Brautigam et al. 2017). [2] Estimates provided by City of Cincinnati Office of the Environment & Sustainability (Kroner 2017). [3] Estimate from (Strategic Energy Innovations 2009). [4]Estimate provided by Miami University IES based on three previous GHG emissions conducted by IES 610 Professional Service Project teams (Zazycki 2018).

2.4. Benefits of GHG Inventories

While conducting a GHG inventory can be costly and time consuming, there are several important benefits. An inventory allows cities to take effective action to mitigate climate change, to understand sources of emissions in the community, and to decide where to focus reduction efforts (Fong et al. 2014).

In addition, updating the GHG inventories on a regular basis can help track progress at meeting emission reduction goals. By comparing total overall emissions, as well as emissions from each sector and subsector, cities can see whether emissions are increasing or decreasing. For instance, when Aspen compared results of a 2014 GHG inventory to previous inventories, they recognized they had successfully reduced emissions even though the population and economy had grown (Figure 12).

Likewise, the Borough of West Chester, PA conducted its baseline inventory in 2005 and found that the majority of emissions were from vehicles, residential, commercial and industrial energy, with only small amounts of emissions from government operations (Figure 13). The Borough realized that the government needed the help of the community to reduce emissions (BLUER 2009).

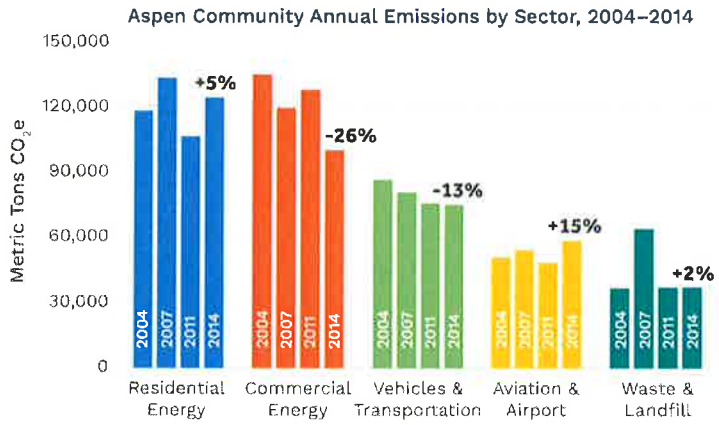


Figure 12. Four inventories were taken in 2004, 2007, 2011, and 2014 in Aspen, Colorado for comparison of GHG emissions in metric tons for five different sectors: residential energy, commercial energy, vehicles & transportation, aviation & airport, and waste & landfill (City of Aspen 2014).

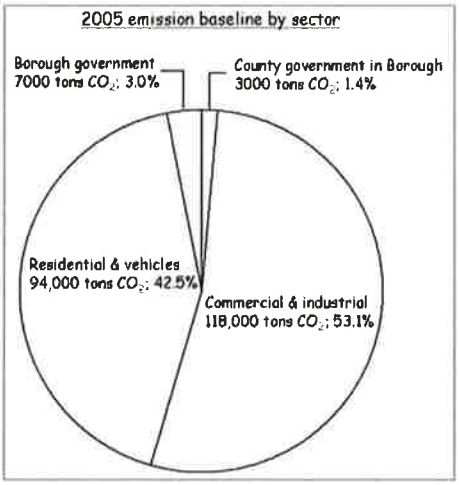


Figure 13. Results of 2005 GHG inventory for Borough of West Chester, PA (BLUER 2009).

CHAPTER 3: SETTING TARGETS AND CREATING CLIMATE ACTION AND ADAPTATION PLANS

3.1. Setting Emission Reduction Targets

Within two years of making the commitment to join the Covenant, cities must set GHG emission reduction targets (Compact of Mayors 2015b). GHG reduction targets are set as a guide to help cities plan for reducing emissions. All targets must identify a baseline year which progress will be measured from. They must also identify the target level of reduced emissions and the year they plan to achieve that reduced level (Compact of Mayors 2015b). The baseline GHG inventory must be completed no more than three years prior to the reporting year (Compact of Mayors 2015b). A GHG inventory for government operations was conducted for Oxford in 2009 by a Miami University Professional Service Project team (Ford et al. 2009). The 2009 inventory cannot be used as the baseline year because it is more than three years old. However, the 2009 inventory can still be used to better understand how inventories are conducted and provide general information about Oxford municipal emissions from that time period.

Covenant Emission Target Requirements

Mitigation: By the end of year two, after a complete GHG inventory has been conducted, signatories of the Covenant are required to set GHG reduction targets and report these targets to the Covenant governing body. Targets must include a baseline year of emissions (year from which the progress will be measured), a target year (when the target will be achieved) and the GHG emission source to which the target applies. (Compact of Mayors, 2015b)

There are four acceptable formats for GHG reductions targets (Fong et al. 2014):

1) **Base year reduction.** This target specifies a baseline year from which the target will be measured, a percent reduction goal, and a target year. For example, a 20% reduction from 2010 emissions by 2030 (Figure 14).
2) **Fixed-level reduction**. This target does not specify a baseline year, only a fixed emission goal and a target year. For example, net-zero emissions by 2050 (Figure 15). [This target type may be the exception to the requirement that cities identify a baseline year; however, Covenant representatives were not able to be reached to clarify.]
3) **Intensity reduction**. This target is similar to the base year reduction target, but it is instead based off of emissions intensity instead of simply emissions. Emission intensity is defined as the emissions per unit of another variable, usually GDP, but may also be population or another variable. This allows cities to incorporate other factors, such as growth of the economy, into their emissions targets.
4) **Baseline scenario reduction**. This target sets a goal relative to a predicted "baseline scenario," which represents the conditions most likely to occur if a city does not implement any activities to meet the target. This is sometimes referred to as a "business-as-usual" case.

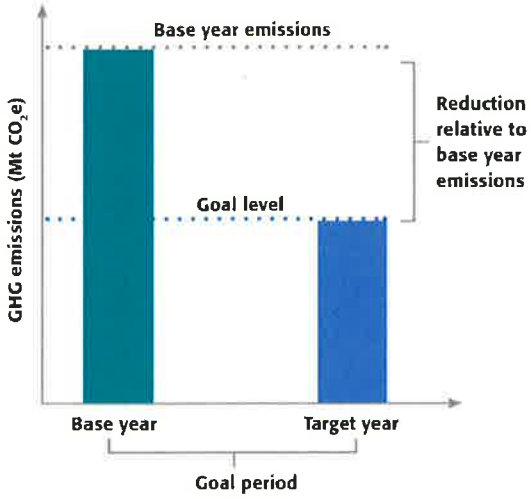


Figure 14. A graphical representation of a base year reduction goal. The reduction relative to the base year emissions is represented by the difference in the size of the bars (Fong et al. 2014).

For signatories of the Covenant, targets must be consistent with or exceed the country's intended nationally-determined contribution. This is the level of GHG emission reduction that each country specified at the UN Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP21), the conference at which the Paris Agreement was negotiated. However, because the United States has resigned from the Paris Agreement, this is no longer a legal requirement for American cities (Global Covenant of Mayors Secretariat 2018).

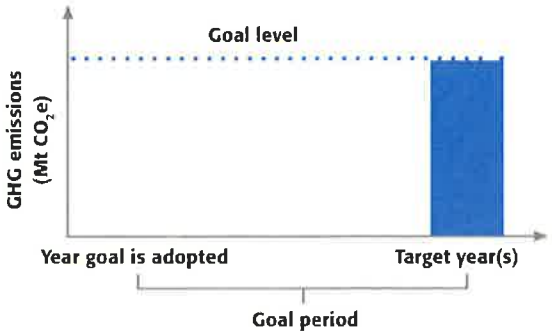


Figure 15. A graphical representation of a fixed-level reduction goal. Unlike the base year reduction goal, there is no base year specified (Fong et al. 2014).

To better understand the targets chosen by cities, our team reviewed a total of 71 targets specified by 44 signatory cities (Appendix C). Our findings revealed several common trends for setting targets among the cities:

- Many Covenant cities have chosen to specify more than one target. Cleveland, for example, has specified 3 targets, all with a baseline year of 2010: a 16% reduction by 2020, 40% by 2030, and 80% by 2050 (Sustainable Cleveland 2016).
- A majority of the targets specified by sampled Covenant cities (86%) used a base year reduction format, with the remainder specifying net-zero emissions goals.
- The most common base year was 1990, although many cities used a more recent base year, including as recent as 2017.
- Reduction level varied from 10% to 100%.
- The most common, and latest, target year was 2050.

This research shows that there is a great deal of variety in the emissions targets adopted by other cities, giving Oxford flexibility in its targets were it to sign the Covenant.

3.2. Creating Climate Action Plans

A climate action plan (CAP) is a comprehensive outline of the specific actions a city plans to take to reduce their GHG emissions. They are used as "roadmaps" to help guide cities in making informed decisions that further municipal goals. To fulfill the obligations of the Covenant, CAPs must include:

4) A political commitment
5) A vision statement
6) Context of the plan
7) Baseline GHG emissions from the GHG inventory
1) Business-as-usual GHG emissions
2) An implementation plan
3) A monitoring plan (Compact of Mayors 2015b)

Covenant Planning Requirements
Climate Action Plans

Mitigation: By the end of year three, signatories of the Covenant are required to develop a Climate Action Plan which demonstrates how the city will deliver on its commitment to reduce GHG emissions. They must submit this report to the Covenant governing body. The Climate Action Plan must be completed within or updated within 5 years of the reporting year (Compact of Mayors 2015b).

Though the general term for this document is "climate action plan," many cities have different names for the report or plan they create to fulfill this requirement. For example, the signatory city Ithaca, NY refers to its as an "Energy Action Plan" (Taitem Engineering, P.C. and Belmaker 2013), while the Borough of West Chester, PA, also a signatory, created a "Local Action Plan" (BLUER 2009).

There is a wide array of approaches that cities have taken to frame their emission reduction plan. Because the CAPs are meant to help the community understand the city's sustainability goals, they are very descriptive and visually appealing. For example, the Borough of West Chester, PA converted per capita emissions into coal briquettes (Figure 16), reporting that each resident used the equivalent of 43,000 briquettes/year, and that each person would need to use 4,300 fewer briquettes to meet the borough's 10% reduction goal. Presenting emissions in these terms makes it easier for residents to take personal responsibility in reducing their own emissions, because they know how many "briquettes" they are personally contributing (BLUER 2009). The city of Burlington, VT organized its CAP around three central questions: Why do we care?, Where are we now?, and Where are we going? (Figure 17), which helps the community to fully understand the process (City of Burlington 2014).

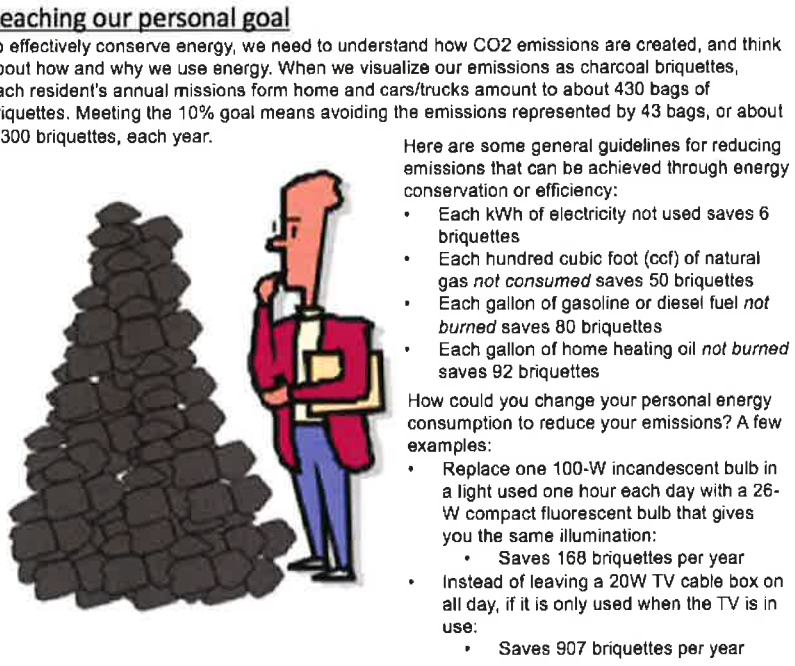


Figure 16. A screencap from West Chester's CAP, showing how they framed their GHG emissions into "briquettes," making it more relatable (BLUER 2009).

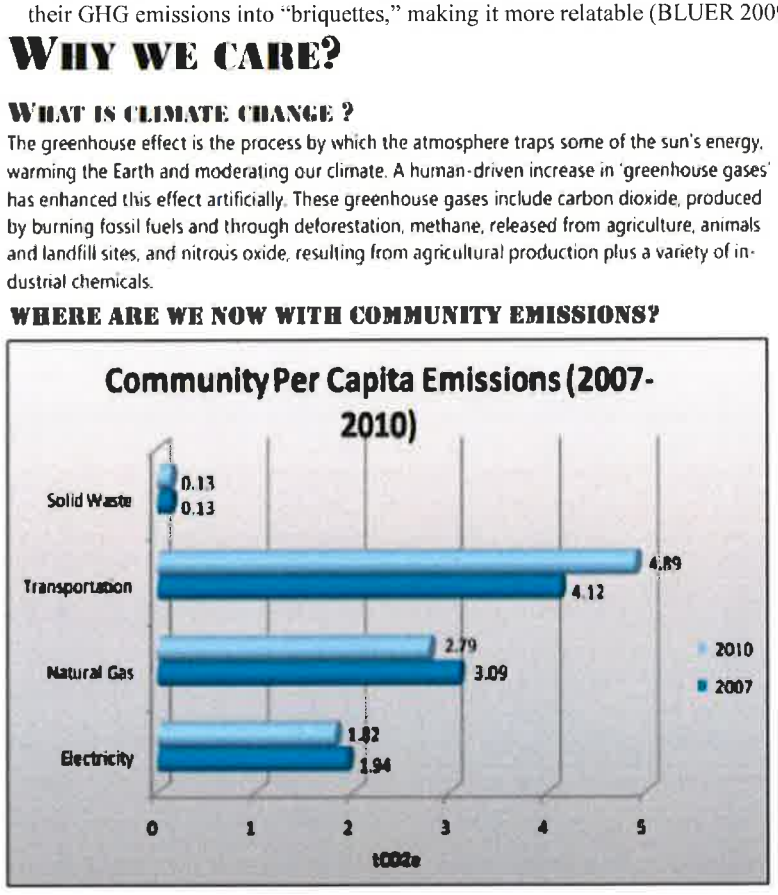


Figure 17. Screencaps from Burlington's CAP (some content omitted) showing how the city organized the document to answer three central questions using language that is accessible to the community (City of Burlington 2014).

3.3. Tools for settings targets and creating a climate action plan

Just as there are tools for helping conduct the GHG inventories, the team researched two tools that can help set targets and provide guidance when developing the CAP, the Climate Action for Urban Sustainability (CURB) tool, and ClearPath's target setting module. CURB is a free, Excel-based tool which was specifically designed to help cities map out different options and evaluate the cost, feasibility, and impact of those options. ClearPath is the tool that we mentioned in Chapter 2 for its GHG inventory capabilities. It is available to cities that pay a membership fee to ICLEI. Because it is only available to fee-paying members, we were not able to explore its capabilities. However, we are able to describe some of the elements of the CURB tool.

To use CURB, the user inputs demographic data about the city and infrastructure, and GHG inventory data. If one used a GPC tool like ClearPath or CIRIS to conduct an inventory, one can directly upload that data into CURB. If one did not conduct a GHG inventory, then CURB will use proxy data to estimate the city's emissions in each sector. This proxy data is global by default, although the tool will use locally-available data where available (World Bank Group 2018).The tool guides the user through the process of setting targets (Figure 18). The first step of this process has the user select whether they want to use an emissions-based target, which is focused on reducing GHG emissions, or an energy target, based on reducing community energy use. The second step is to select a target type, as described in section 3.1 of this report. In the CURB tool, a base year reduction goal is referred to as "base year emissions goal" and an intensity reduction goal is referred to as a "base year intensity goal." There is no direct option to set a fixed-level reduction goal. The final step in setting targets is to choose whether to set interim targets—this is simply the choice between setting one target or multiple (World Bank Group 2017).

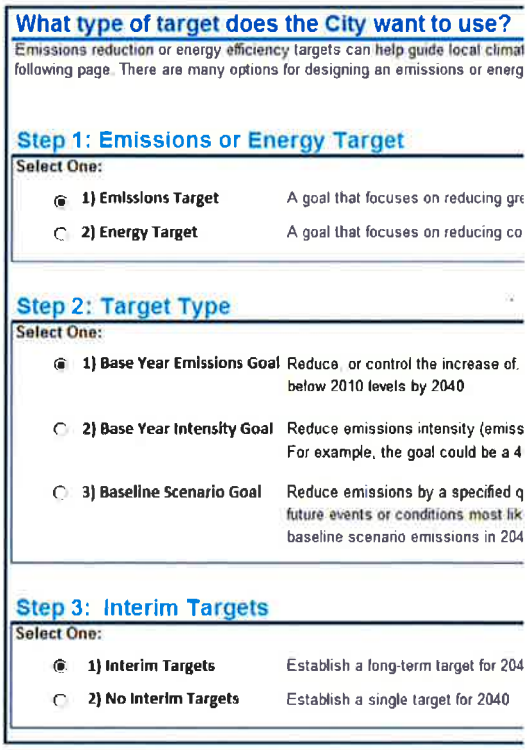


Figure 18. A screencap from the CURB tool, showing the three-step approach to setting targets (World Bank Group 2017).

Based on the data provided by the user, CURB will provide details based on what activities, uses, and materials are currently generating the city's emissions.

Perhaps the most important feature of CURB is its ability to help the users choose actions to implement in order to meet their targets. The user inputs information about the structure of municipal operations, then CURB projects the feasibility of alternative actions (Figure 19). After identifying potentially suitable actions, the user can use the "Action Development" portion of the tool to customize each of these actions to the city (e.g. choose different implementation dates or choose strategies for different income groups). The tool will then produce graphs that allow the user to see the predicted reduction in emissions caused by the implementation of the selected actions (Figure 20).

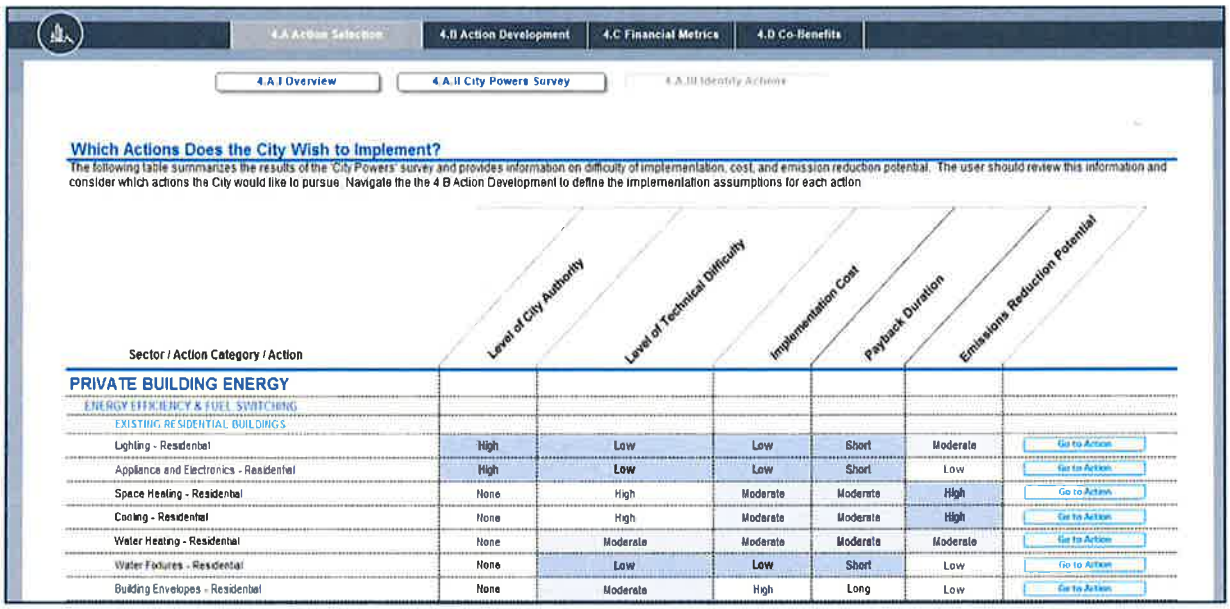


Figure 19. A module within the CURB tool that is designed to aid the user in selecting actions for mitigation. In this case, the user is comparing among energy efficiency actions among existing residential buildings (World Bank Group 2017).

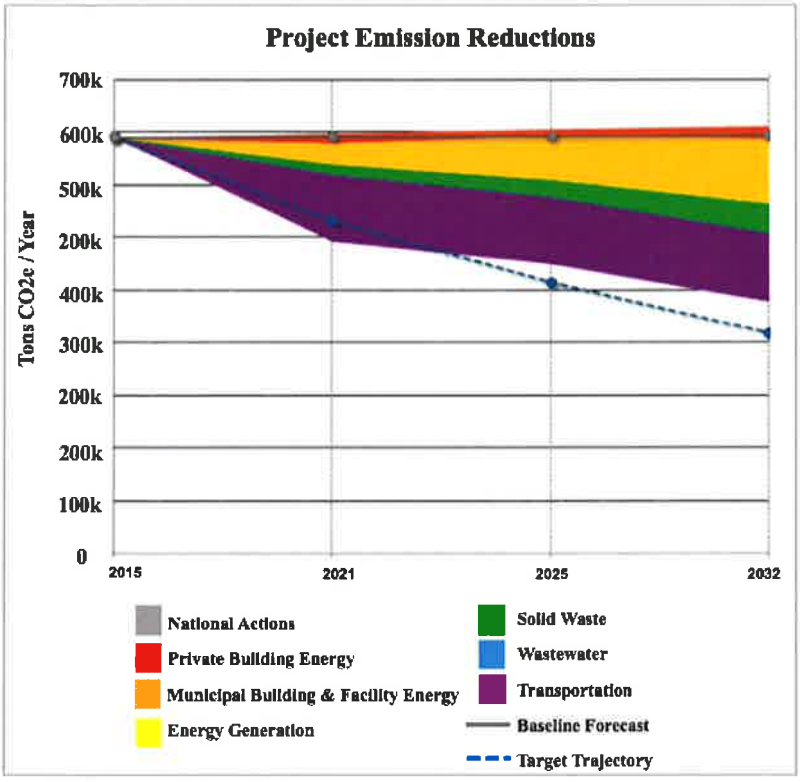


Figure 20. This graph, produced by the CURB tool, shows how a city's selected actions are predicted to impact their emissions over the course of several decades. In this case, the baseline forecast is shown as a solid line, and the trajectory to meet the city's targets is shown with a dashed line. The wedges, representing actions taken in different sectors, get thicker over time, representing emissions that are reduced through these actions (World Bank Group 2017).

3.4. Climate Adaptation Plans

Climate adaptation plans are documents that demonstrate how a city plans to adjust to the expected impacts of climate change in their region. In order to create this plan, a city first needs to identify the hazards that are threatening their region, such as flooding, blizzards, or droughts, which are expected to increase in frequency or intensity due to climate change (Compact of Mayors 2015b). Next, the city needs to conduct a vulnerability assessment. This provides a scientific estimation of climate change risks for the city by determining the probability of the climate change hazards. It also determines the degree to which the city is susceptible to these hazards. These assessments are designed to recognize, evaluate, and communicate the uncertainties that are associated with climate change (Ontario Centre for Climate Impacts and Adaptation Resources 2018). Finally, signatory cities must write a climate adaptation plan. This plan should cover the services and departments that are directly managed by the city government, and may also include actions required by stakeholders. The aim of such a plan is to moderate harm and exploit potential beneficial opportunities from expected impacts of climate change (Compact of Mayors 2015b).

Cities may incorporate adaptation planning in their CAP or they may prepare a separate document solely for adaptation planning. For example, San Luis Obispo, CA, a Covenant city, has integrated adaptation strategies into its CAP (Community Development Department 2012), whereas Aspen, CO created a separate climate adaptation plan. Aspen's plan focuses on the historical observations of climate change, climate models within Colorado, forecasted impacts on the sectors of city, stakeholder opinions on actions needed to be taken, and the preliminary guidance for resiliency planning (Arnott et al. 2014). Several adaptation strategies suggested by San Luis Obispo and Aspen are shown in Table 3.

Covenant Planning Requirements
Climate Adaptation Plans

Adaptation: To satisfy adaptation requirements, cities must submit three documents:

Hazards Report: During the first year, the city must identify and report the climate hazards threatening their region which are expecting to increase in frequency or intensity due to climate change.

Vulnerability Assessment: Within two years of joining, cities must conduct and submit a climate change risk assessment and/or vulnerability assessment (Compact of Mayors 2015b).

Climate Adaptation Plan: By the end of year three, signatories of the Covenant must develop and submit a Climate Change Adaptation Plan which demonstrates how the city will adjust to the actual impacts of climate change in the region.

(Source: Compact of Mayors 2015b)

Table 3. Adaptation strategies among two Covenant cities- Aspen and San Luis Obispo.

Factor	Adaptation Strategy	City
Extended droughts	Water efficiency planning and riparian health management	Aspen, CO (Source: Arnott et al. 2014)
Increasing summertime high temperatures	Integration of demand-side management and GHG reduction strategies in energy resiliency planning	
Shift in the magnitude of temperature and precipitation extremes	Integrate additional mudflow and stormwater mitigation techniques into urban design parks and projects	
Changing ranges of disease-carrying species	Prioritize potential threats to public health and safety	
Increase in GHG emissions and reduction in air quality	Stricter federal and state vehicle emissions standards to help counteract temperature impacts on vehicle emissions	

Extended droughts	Reduce per capita water use and increase water reserves	San Luis Obispo, CA (Source: Community Development Department 2012)
Increase in temperature may increase methane production at landfills	Harvest methane as an alternative fuel source	
Increase in frequency and severity of heat waves	Facilities (city owned, educational, and commercial) with working air-conditioning systems should be accessible to the general public during a heat wave	

3.5. Time and Cost Estimates

The cities of Ithaca, NY, Cleveland, OH, and Aspen, CO have created CAPs and received help from consultants or facilitators during the process. Cleveland hired consultants to complete their CAP with rates between $80/hr. -$150/hr. depending on the level of experience of the engineering or sustainability analyst (Table 4). The city of Ithaca hired Taitem Engineering to complete a study on the best renewable energy alternatives for the city, which was incorporated into their CAP. To complete the CAP for Aspen, CO, a facilitator was hired to oversee the discussions within the panel of sustainability, climate experts, and community leaders (Table 4).

Table 4. Cost estimates from cities that used consultants in their climate action planning process.

Time	**Cost**
Varies – depends on desired actions[1]	$83 - $142/hour to determine specific climate actions
1-2 Years for Consulting Firm[2]	$30,000 - $50,000
2 Years for Facilitator[3]	$5,000

[1]Estimates provided by City of Cleveland Office of Sustainability (Mayor's Office of Sustainability 2018).
[2]Estimates provided by Taitem Engineering (Vogel 2018). [3]Estimates provided by City of Aspen (Menges 2017)

CHAPTER 4: OTHER OPTIONS AVAILABLE FOR THE CITY OF OXFORD

To help Oxford decide how to mitigate the impact of GHG emissions and adapt to climate change, we reviewed the options that are available if Oxford decides to not sign the Covenant. We found several organizations and resources focused on emission reduction and climate action, and have highlighted two in this chapter - ICLEI and STAR Communities. We also found many free and downloadable documents to help cities with these processes, and we describe a selection of four that we found to be the most accessible and useful. In addition, we examined cities that were comparable to Oxford in terms of population, including some that are college towns as well. We use our selection of five cities to highlight how other cities utilize community involvement in all aspects of climate mitigation and adaptation.

4.1. Organizations the City Could Join

4.1.1. ICLEI - Local Governments for Sustainability

ICLEI is a global network of more than 1,500 cities, towns, and regions committed to building a sustainable future (ICLEI 2018d). ICLEI supports local governments in becoming more sustainable by providing them with resources such as technical consulting, training, and information services. ICLEI requires a payment of annual dues which is determined by population size. The annual dues for Oxford would be $600 per year (ICLEI 2018b). Members gain access to resources that enable them to more easily conduct GHG inventories and help with climate action planning. The most significant resource ICLEI provides is the ClearPath tool. As mentioned in previous chapters, this tool contains several modules, including ones that assist with the GHG inventory, creating emission reduction targets, and assisting with evaluating options for climate action planning. ClearPath can be considered to be an all-in-one tool to help make decisions about reducing emissions and adapting to climate change.

With an ICLEI membership the city will also have access to ICLEI's Five Milestones Framework. The Five Milestones Framework offers a systematic approach for examining baseline GHG emissions, developing emission reduction targets, developing and implementing a CAP, and monitoring emission reduction progress (Figure 21) (ICLEI 2018d).

Figure 21. ICLEI's Five Milestones Framework. This is similar to the Covenant without a time restriction (ICLEI 2018c).

Members of ICLEI also gain access to a comprehensive online training library, detailed step-by-step guidance, and ICLEI's expert technical assistance. Over 1,000 different cities have participated in this system and it is open to cities of all sizes. Ohio cities as big as Cleveland, Cincinnati, and Columbus and as small as Kent, Oberlin, and Yellow Springs are also making progress following the Five Milestones Framework (Roberts 2018). The information for Kent, Oberlin, and Yellow Springs is not publicly available, however our contact from ICLEI stated they could provide further information if requested by the City of Oxford.

4.1.2. STAR Communities

STAR Communities is a non-profit organization that provides a framework that cities can follow to become more sustainable. The STAR Community Rating System is used by cities and countries to measure their progress across social, economic, and environmental performance areas (STAR Communities 2016). The framework that STAR Communities uses is "menu-based," where participants are able to tailor their approach based on local conditions and priorities. There are eight areas of focus called "goal areas" in the STAR certification program: Built Environment, Climate & Energy, Economy & Jobs, Education, Arts & Community, Equity & Empowerment, Health & Safety, Natural Systems, and Innovation & Process (Figure 22) (STAR Communities 2016).

Built Environment	Climate & Energy	Economy & Jobs	Education, Arts & Community	Equity & Empowerment	Health & Safety	Natural Systems	Innovation & Process
Ambient Noise & Light	Climate Adaptation	Business Retention & Development	Arts & Culture	Civic Engagement	Active Living	Green Infrastructure	Best Practices & Processes
Community Water Systems	Greenhouse Gas Mitigation	Green Market Development	Community Cohesion	Civil & Human Rights	Community Health	Biodiversity & Invasive Species	Exemplary Performance
Compact & Complete Communities	Greening the Energy Supply	Local Economy	Educational Opportunity & Attainment	Environmental Justice	Emergency Management & Response	Natural Resource Protection	Local Innovation
Housing Affordability	Energy Efficiency	Quality Jobs & Living Wages	Historic Preservation	Equitable Services & Access	Food Access & Nutrition	Outdoor Air Quality	Good Governance
Infill & Redevelopment	Water Efficiency	Targeted Industry Development	Social & Cultural Diversity	Human Services	Health Systems	Water in the Environment	
Public Parkland	Local Government GHG & Resource Footprint	Workforce Readiness	Aging in the Community	Poverty Prevention & Alleviation	Hazard Mitigation	Working Lands	
Transportation Choices	Waste Minimization				Safe Communities		

Figure 22. STAR Framework of Sustainability Goals & Objectives. There are eight goal areas which are listed across the top, with 49 objectives to achieve these goals (STAR Communities 2016).

For STAR certification, cities can earn up to 100 points per goal area. These points are combined to determine the total STAR rating (Figure 23). A certified STAR Community Rating lasts for four years after the award date. After four years the community is expected to measure and report progress through recertification.

Certification Levels	Point Range
Certified 3-STAR Community *Recognized for sustainability leadership*	250 - 449
Certified 4-STAR Community *Recognized for national excellence*	450 - 649
Certified 5-STAR Community *Recognized as top tier achiever in national sustainability*	650+

Figure 23: General descriptions and point ranges required for certification (STAR Communities 2016).

There is no required population size to achieve STAR Community certification. Cities as small as Charles City, IA (population of 7,600) and as large as Houston, TX (population of 2.2 million) have successfully completed this certification (STAR Communities 2016). One city of note is Northampton, MA, which achieved a 5 STAR rating (Figure 24). With a population of approximately 28,000 and home to a small university, Smith College, it has similar qualities as Oxford, demonstrating that this rating system could be a possible option for Oxford.

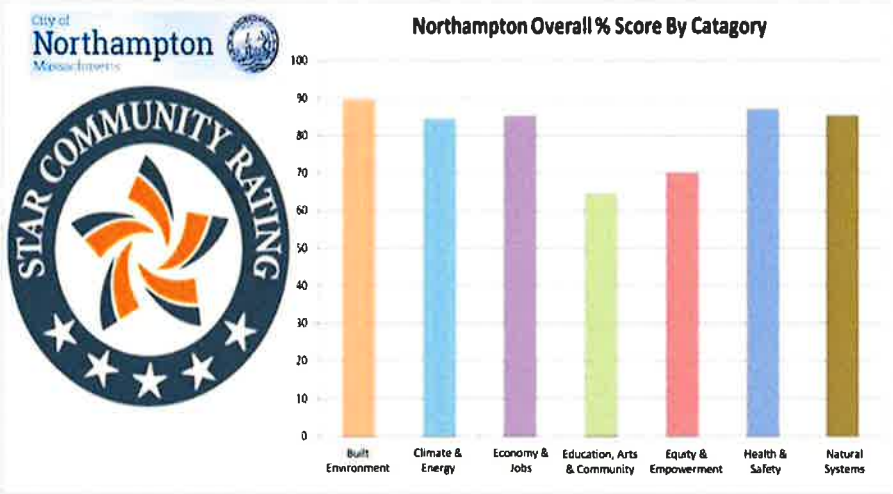


Figure 24. Northampton's 5-STAR Community Rating, the first US Community awarded this "top tier achieve in national sustainability" (City of Northampton 2014).

STAR states that on average, this certification process takes a community a year from start to finish. They recommend that the most efficient way to achieve this is to have one or two key staff people supported by interns, a community sustainability group, a green team, and/or a university partner. On average, cities that have participated spend 1-2 months to get organized and 4-6 months on data collection if they are working part-time on just this framework (STAR Communities 2016).

One does not have to pursue certification in order to use the STAR Communities program. Any city can download the STAR Communities Rating System and use it to guide decision-making. However, if a city would want to pursue certification, there is an annual subscription fee of $1,000 and a $3,000 certification fee. Therefore, the city would need to pay $4000 during the year they submit the certification, and then $1000 for each year in-between. The subscription fee includes the methodology and technical guidance manual, resources for communicating sustainability progress, and tools to support data collection and reporting (STAR Communities 2018).

4.2. Free Guidance Documents

4.2.1. STAR Communities

STAR Communities also offers a basic package that is available to cities for free. This package includes free tools and resources that enable cities to become more familiar with the STAR Community Rating System. These tools can be used to support local sustainability work and help a community to integrate sustainability into their planning efforts. The organizations rating system can be downloaded directly but does not provide exact actions that could implemented; rather, it provides the user with a direction to take. Further details on the free tools and resources offered in the basic package merely requires that a city create a free account through STAR.

4.2.2. C40 Cities

C40's focus is to address climate change by encouraging urban action that reduces GHG emissions as well as climate risks (C40 Cities 2018a). This initiative has many networks that aim to connect city officials around the world, showcase ideas and solutions of leading global cities, advise cities based on experience with similar projects and policies, and influence national and international policy agendas (C40 Cities 2018a). C40 provides downloadable resources titled "Good Practice Guides" that Oxford could utilize without joining C40 Cities (the Good Practice Guide for "Municipal Building Efficiency" is included in Appendix D) (Figure 25). The Good Practice Guides identify nearly 70 categories of good practices for climate change actions in subjects such as energy, transport, solid waste management, urban planning, and adaptation and finance (C40 Cities 2018b). These guides contain over 100 case studies from cities around the world and provide many examples of climate solutions to learn from. They are free and available to download through their website.

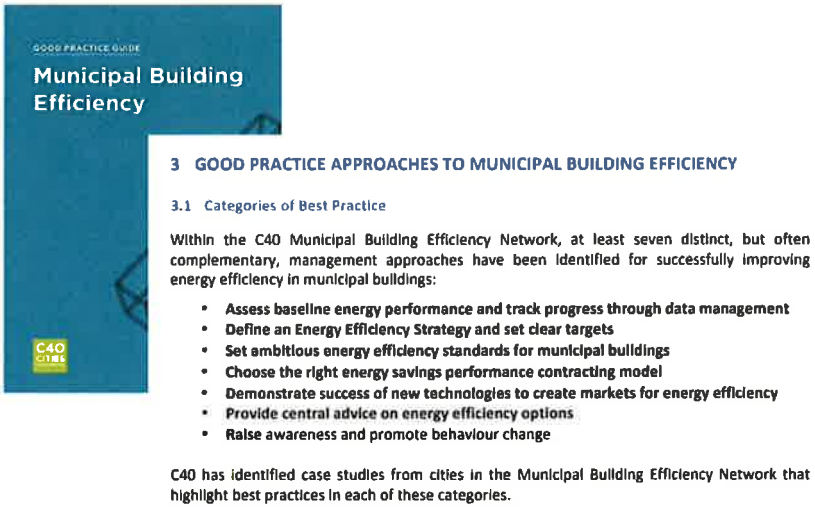


Figure 25. Example of a C40 Good Practice Guide titled, "Municipal Building Efficiency" (C40 Cities 2018b).

4.2.3. Environmental Protection Agency

The United States Environmental Protection Agency (USEPA) has various programs to assist individuals, business and manufacture owners, communities, and the federal/state government in pursuing sustainable actions (USEPA 2018). Four of the programs that could potentially be used by Oxford are included in Table 5.

Table 5. A selection of EPA programs for states, communities, and businesses (USEPA 2018).

EPA Program	Intention	Expected User
EnergyStar	Protect the climate, and save money, by using superior energy efficient appliances	Businesses/individuals
Economy, Energy, Environment (E3)	Connect with resources to implement sustainable business practices	Small-to-medium-sized manufactures
Smart Growth	To expand economic opportunity while protecting public health and the environment	Communities
Green Infrastructure	To support resiliency and sustainability within the environment	Communities

The USEPA also provides a guide titled "Planning for a Sustainable Future" (Figure 26) which contains information to help local governments implement sustainable practices, fund implementation, and measure the success of implementation. The guide offers guidance in the following areas: transportation, land use planning, biological conservation and open space preservation, solid waste generation and recycling, energy, air quality and climate, protecting water quality and ensuring future supply, green building, and green procurement (USEPA 2008).

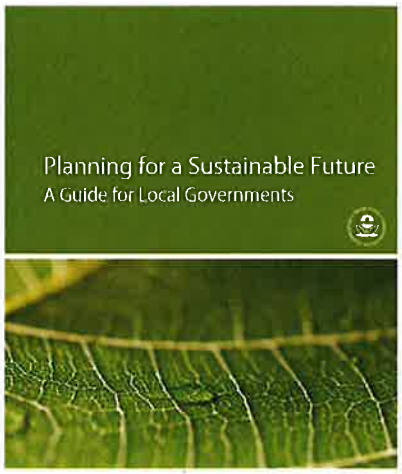


Figure 26. EPA Sustainable Practice Guide (USEPA 2008).

One additional free, downloadable resource provided by the USEPA is the Local Greenhouse Gas Inventory Tool. The tool includes one module for community-wide inventories, and another for government operations only. A community-wide GHG inventory created using this tool is GPC-compliant, but a government operations inventory would not be (ICF 2018). A full list of sources needed for the Local Greenhouse Gas Inventory Tool is included in Appendix E.

4.2.4. Statewide Programs – Minnesota GreenStep Cities

There are 12 states in the US that have statewide programs to encourage their municipalities to take steps to reduce emissions and become more sustainable: California, Connecticut, Florida, Massachusetts, Maryland, Michigan, Minnesota, New Jersey, New York, Pennsylvania, Virginia, and Wisconsin (N2S2O 2018). We examined each program to determine if there were readily available guidance documents that Oxford could use. Each website varied in terms of user friendliness, accessibility, and amount of information available. After reviewing all of the states' programs, we found Minnesota GreenStep Cities to be the most useful for Oxford.

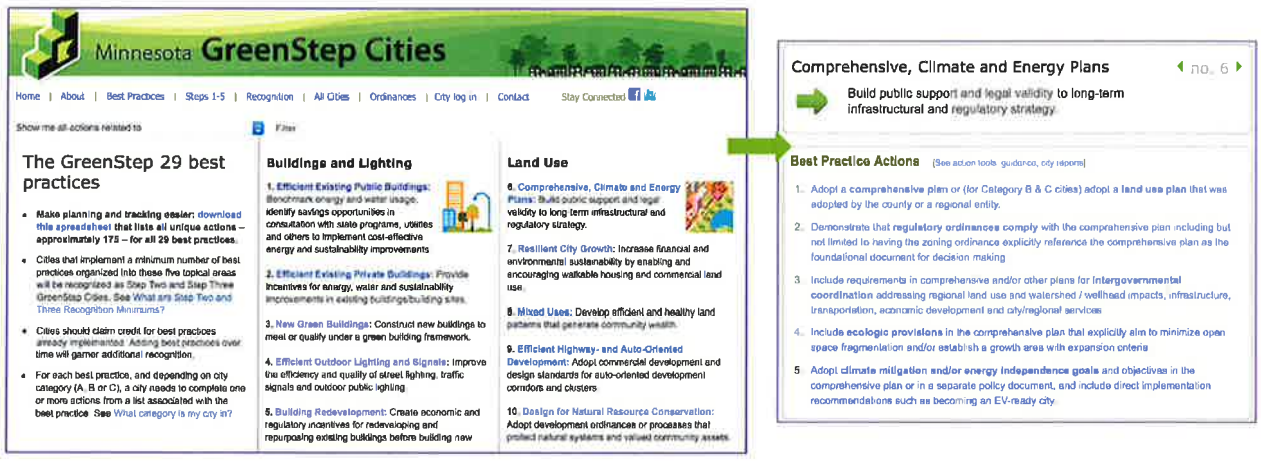


Figure 27. While not in Minnesota, Oxford could use these Best Practice Action guides for its own climate planning, as they are freely accessible online (Minnesota GreenStep Cities 2018).

GreenStep Cities is a program available to Minnesota governments that provides a pathway to encourage the adoption of sustainable best practices which focus on GHG reduction (Minnesota GreenStep Cities 2017). This program highlights 29 best practices in transportation, buildings and lighting, environmental management, land use, and resilient economic & community development (Figure 27) (Minnesota

GreenStep Cities 2018). The user can select a category to access step-by-step guidance and case studies. The website was easy to navigate, and we were able to access all the guidance documents. While Oxford would not pursue the Minnesota GreenSteps certification, it could still use the guidance documents.

Figure 28. UN-Habitat emphasizes community engagement in climate action planning (UN-Habitat 2015).

4.3. Engage the Community in Sustainability and Climate Planning

The United Nations (UN)-Habitat Program has created a document to help guide cities in climate action planning, which explicitly emphasizes the importance of involving the public in the planning process (Figure 28) (UN-Habitat 2015). This means that those impacted by climate change are given a role in planning, including people who are frequently marginalized (UN-Habitat 2015). We have found many examples of cities engaging the community in the climate planning process, both signatories of the Covenant and non-signatory cities. The following case studies feature cities that are taking steps to mitigate emissions and adapt to climate change by involving their communities.

4.3.1. **Burlington, Vermont** (population: 42,260)

Burlington, VT, home of the University of Vermont (enrollment ~12,000), is currently a signatory of the Covenant *but* they created their CAP in 2008, prior to signing the Covenant. The City currently has one Sustainability Coordinator but there is no mention of an environmental commission group. However, their climate action planning process is exemplary when it comes to engaging the community. They conducted eight working groups, involving over 100 community members and city staff, to help develop strategies for emissions mitigation. These working groups produced over 200 recommendations that were then shared at a town meeting. Of these 200 strategies, 39 were chosen to be included in the city's CAP (City of Burlington 2014).

4.3.2. **Athens, Ohio** (population: 25,341)

Athens, Ohio, home of Ohio University (enrollment ~23,000), is not a signatory of the Covenant. However, through active community engagement, the City created a Sustainability Action Plan in 2017. The city established the Environmental and Sustainability Commission in 2012. This commission handles

the implementation of environment and sustainability goals, and is comprised of nine community members, one city council member, and one graduate student attending Ohio University. In 2017, the commission created a Sustainability Action Plan with assistance from the community.

Priorities identified by community members at the initial public meeting

1. **City-wide Zero Waste** – Rural Action is leading the effort to help businesses go zero waste
2. **Banning Plastic Bags** – Councilperson Cochran has presented a resolution on single-use bag fee to curb plastic bag consumption
3. **Composting** – is legal within city limits. The Athens Hocking Recycling Center (AHRC) has curbside pickup for city residents
4. **Single Stream Recycling** – was enacted city-wide in 2016. Recycling is increasing and should continue to do so now that larger recycling bins are available to residents
5. **Multi-Unit Housing Recycling** – The AHRC has reached out to units to provide recycling services
6. **Construction/Demolition Materials Recovery** -- AHRC is working on outreach to construction agencies

Figure 29. Priorities that community members identified for the city of Athens to pursue under the section "energy and waste" (City of Athens ESC 2017).

Guided by the City's Environment and Sustainability Commission, public meetings were held to gain community input on sustainability strategies, which were then included in the city's Sustainability Action Plan. Community members identified priorities for the city under several sections, such as energy and waste (Figure 29) (City of Athens ESC 2017).

4.3.3. Key West, Florida (population: 26,990)

Key West, FL has a fluctuating tourist population and is not a signatory of the Covenant. However, Key West is a member of ICLEI and has developed a CAP. Their CAP was possible through collaboration with the community (City of Key West 2009). The Key West City Commission organized 18 community groups ranging from the climate action team to groups specializing in such topics as water, trees, or bicycling (Figure 30).

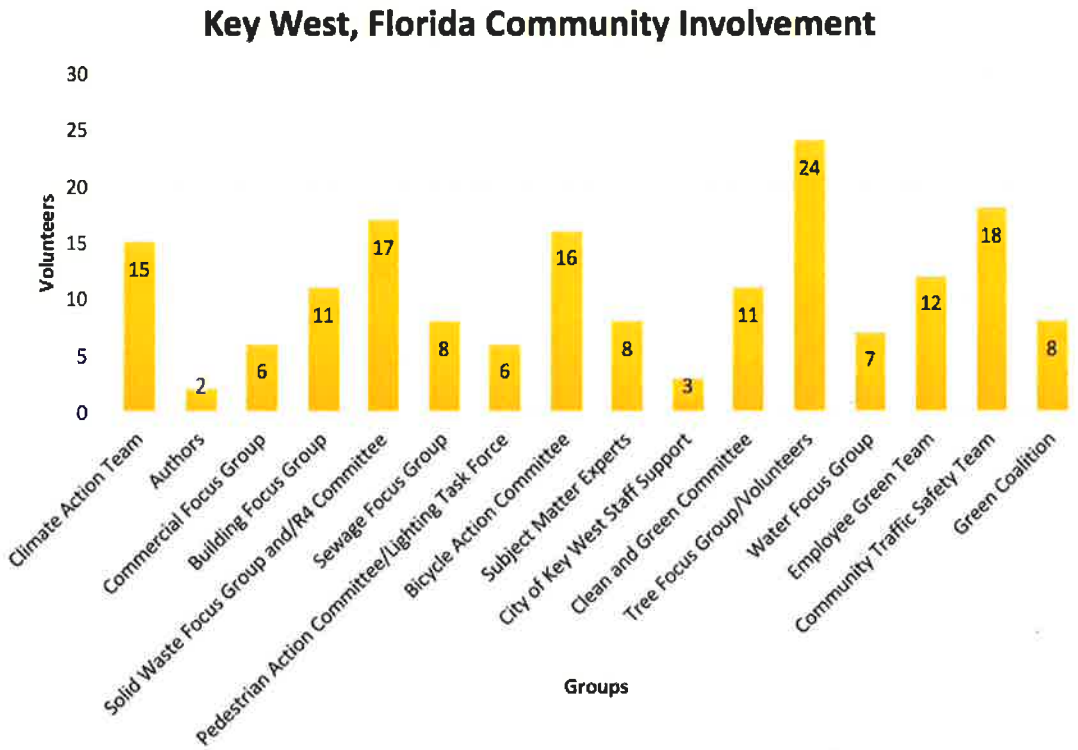


Figure 30. Key West has community involvement volunteer groups, with anywhere from 2-24 volunteers in each group (City of Key West 2009).

In the same year, the City Commission formed the Sustainability Advisory Board to advise, promote, and assist the city in creating and reaching sustainability goals (City of Key West 2018). The Sustainability Advisory Board is similar to the OEC in terms of its function and small size (City of Oxford 2018; City of Key West 2018).

Key West decided to take local action to reduce GHG emissions by completing a GHG inventory with help from ICLEI's planning tools. Combined with their inventory results, the City Commission created a Local Action Plan which is comparable to a CAP. Key West realized that the success of their Local Action Plan would depend on strong community support and decided to build this support through public participation. They established a community task force to work with municipal staff, utilized volunteers from the community to consult in formulating the plan, and in presenting it to the public (City of Key West 2009).

4.3.4. Lafayette, Colorado (population: 28,261)

In September of 2017, Lafayette's City Council set a target to reduce community GHG emissions by 80% below measured 2005 levels by 2050 and to rely solely on renewable energy sources for electricity by 2030 (City of Lafayette 2018). They currently have five GPC-compliant GHG inventories completed in 2005, 2009, 2011, 2015, and 2016 by either Lafayette or Boulder County. With increased interest in sustainability for the city, a volunteer-based citizen-member committee was formed. This group is titled the Lafayette Energy Sustainability Advisory Committee (LESAC) and is composed of nine volunteer members with three additional members serving as city council liaisons. LESAC was established to provide advice and direction for the city in matters related to energy sustainability. The city has not yet completed a CAP, but the LESAC has completed an Energy Sustainability Master Plan. This plan was designed as a guide for energy sustainability goals and as a planning tool to help the City Council integrate energy issues in its decision-making process (City of Lafayette 2018).

LESAC faces many challenges similar to the OEC. Lafayette is a small, growing city whose population went from 14,918 in 1990 to 28,261 in 2016. In addition to their population nearly doubling, housing stock and transportation has also increased, making emission reductions challenging to accomplish. LESAC has limited resources and time within their citizen committee and no staff member solely dedicated to sustainability. However, these challenges have not hindered LESAC's ambition to make a difference. They have still accomplished many of their goals since 2009 through working with city council.

4.3.5. Bowling Green, Ohio (population: 31,588)

Bowling Green, Ohio, home of Bowling Green State University (enrollment ~17,000), is not a signatory of the Covenant. The local government of Bowling Green, OH does not currently have a board or commission specifically focused on sustainability measures, and they have yet to complete a GHG inventory or a CAP. However, they did form a task force to create a community action plan that describes strategies to improve the quality of life for residents. The community wanted the neighborhoods of Bowling Green to be "attractive, walkable and bikable, with abundant green amenities" (City of Bowling Green 2018). A primary goal for Bowling Green's community action plan was to ensure that local residents and stakeholders had the necessary tools and information needed to actively participate in the planning process. To facilitate this, the City held four community meetings, a landlord roundtable, a City

staff meeting, a student meeting, and engaged with community members at the farmer's market, to gain input from members who were unable to attend the formal meetings (Figure 31) (City of Bowling Green 2018).

Figure 31. Bowling Green's schedule for community meetings from 2016-2018 (City of Bowling Green 2018).

Bowling Green has also taken community input into account for energy planning. In 2017, Bowling Green installed the largest solar field in Ohio. As a result of strong community support, the city is considering a second solar installation which they refer to as the "community solar" project (McLaughlin 2018). This project will allow community members who are interested in renewable energy to be involved. The City of Bowling Green also engages with the community by partnering with a key stakeholder, Bowling Green State University, on many sustainability projects. Recently the city and biologists from the university have teamed up to determine what native plants will be most effective in bringing local pollinators back to the city. They are doing this through grant-funded research by placing these plants inside of their solar field to utilize the open space (Henry 2018).

CHAPTER 5: RECOMMENDATIONS

Throughout our research, we found that conducting a GHG inventory and creating climate action and adaptation plans could take considerable time and resources. To conduct an inventory, we found examples of cities which hired a consulting firm, at a reported cost of $10,000/year, or devoted full- or part-time staff to conducting an inventory. The planning process alone for the inventory has been reported to take up to five months, plus an additional several months to collect the data. In addition, the overall cost of completing a CAP has been reported to be up to $50,000 (for hiring a consultant). The cities we researched hired consultants or devoted full-time staff to completing the CAP, with the time commitment reported to be up to two years.

With a three-year time constraint for completing all steps of the Covenant and only one full-time environmental specialist on staff, it does not seem practical to expect Oxford to complete the obligations of the Covenant within the time constraint. The fact that, of the 146 US cities that have signed the Covenant, only 13% have a population under 25,000 and just 5% have a population under 8,000 (Covenant 2018a) could indicate that the Covenant is better suited for large cities with more resources.

Instead of committing to the Covenant at this time, we recommend that Oxford revisit joining the Covenant or another commitment in two years, and make steps now in the areas of climate mitigation and adaptation, as outlined in the action items listen below. This strategy is reflective of many of smaller signatory cities that the team researched, such as Burlington, VT. In 1996, Burlington joined the "Cities for Climate Projection" campaign through ICLEI, making its first steps toward climate mitigation and adaptation. Two years later, the city set its first emission reduction targets and formed a Climate Protection Task Force. The city's first CAP was adopted two years later. In 2008, the city began to update its CAP, which was completed six years later in 2014 (City of Burlington 2014). All of this was done before the Compact of Mayors, the predecessor to the Covenant, was established. Because of the significant progress Burlington had already made in mitigation and adaptation, it was easier to make a commitment to the Covenant. Burlington is just one example of several that came up in research demonstrating that many signatory cities made significant advances in climate mitigation and adaptation *before* committing to the Covenant.

1. **We recommend that Oxford conduct a full GHG inventory that is GPC-compliant.**
    - Conducting a GHG inventory would help Oxford understand its current state of emissions, and potentially identify "low-lying fruit" - sectors or processes from which it would be relatively easy and cost effective to reduce emissions. Oxford can use free tools, such as CIRIS, or join ICLEI to gain access to ClearPath, which would assist in completing the inventory. The City can also seek assistance from Miami University, which would help avoid the cost of a consultant. Oxford could use this GPC-compliant inventory as a baseline if it signs the Covenant at a later date.
2. **We recommend that Oxford begin the climate change mitigation and adaptation planning process by taking the following actions:**
    - Review the US Army Corps of Engineers report titled "Ohio River Basin- Formulating Climate Change Mitigation/Adaptation Strategies through Regional Collaboration with the ORB Alliance," which uses complex modeling processes to determine the specific climate

hazards facing the Ohio River Basin region (US ACE and ORBA 2017). Oxford can use the results of this study to evaluate climate change risks and vulnerabilities specific to the City.

- When updating the City of Oxford Comprehensive Plan, incorporate climate mitigation and adaptation strategies by specifically identifying target areas for emission reduction and taking climate change risks into account. Oxford has taken steps towards sustainability since the adoption of its most recent Comprehensive Plan in 2008, such as incorporating best management practices for stormwater regulation, installing LED lights in streetlamps, becoming a Tree City USA, and installing efficient appliances in government buildings. However, there is no specific mention of climate mitigation or adaptation in the Comprehensive Plan. Our research found examples of cities that incorporated climate action planning into a comprehensive plan or a similar document rather than create a separate CAP. This option gives Oxford the flexibility of targeting the areas of highest priority that are most feasible and cost effective for the City.
- Utilize free guidance documents for step-by-step assistance on climate mitigation and adaptation. We found that the programs outlined in section 4.2, such as STAR Communities, C40 Cities, various USEPA programs, and Minnesota GreenStep Cities, are very robust and comprehensive. They were created with the intent of providing cities with the guidance necessary to pursue climate mitigation and adaptation, and they provide a wide variety of best practices and clear action steps. These sources could provide Oxford with the framework necessary to make progress towards mitigation and adaptation.

3. **We recommend that Oxford join ICLEI to gain access to the Five Milestones Framework for managing emissions, the ClearPath GHG inventory tool, and expert technical assistance.**
   - At an annual cost of $600, we recognize that the membership fee for ICLEI is not trivial. However, based on our research of this organization, we believe it is a cost-effective alternative for Oxford. The Five Milestones Framework would provide Oxford guidance and direction for mitigation and adaptation without the time restraints of the Covenant. The ClearPath tool can assist Oxford in conducting a GPC-compliant GHG inventory, as well as in setting emissions targets and creating a CAP. The expert technical assistance provided through ICLEI could assist the City if it needs any additional support. We interacted with ICLEI representatives throughout the course of our project, and found them to be helpful, supportive, and available.
4. **We recommend that Oxford establish a task force of community members to help with climate mitigation and adaptation planning.**
   - As discussed in section 4.3, the UN-Habitat Program specifically emphasizes the importance of community involvement for climate planning, and many cities we researched used community involvement to meet their mitigation and adaptation objectives. This came in the form of community meetings, roundtables, student meetings, involvement at community events such as farmer's markets, and the establishment of working groups, citizen-member commissions, advisory boards, and tasks forces. Community involvement is not a new concept for Oxford, as it was used in the development of the 2008 Comprehensive Plan. To write this plan, the City hosted two workshops and an open house, and conducted a survey in

order to gain input from the community. Oxford is fortunate to have a very engaged community, many members of which we interacted with for our research, and who expressed interested in helping the City implement climate planning. Even though community engagement takes time and planning, its importance cannot be overstated.

With climate change posing a myriad of threats to cities around the world, many local governments are taking steps now to work towards climate mitigation and adaptation. This is an immense task that is not easy to overcome. However, we hope that the information provided in this report makes the City of Oxford better poised to make an informed decision about how to proceed.

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APPENDIX A: FINAL SUMMARY OF THE COVENANT

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY SUMMARY

Presented by the Miami University, Master of Environmental Science, Professional Service Project
Oxford Climate Team:

Ryan Bourgart, Celeste Bronson, Page Jordan, K. Clare Quinlan, and Sara Rudokas

Introduction: The Global Covenant of Mayors for Climate & Energy is an international alliance of cities and local governments with a shared long-term vision of promoting and supporting voluntary action to combat climate change and move to a low emission, resilient society. Cities that join the covenant agree to complete a greenhouse gas inventory to determine current emission levels affiliated with city operations and develop a plan to reduce those emissions. This work is divided into four phases with each containing a plan to mitigate – or reduce – the impact of city operations and a plan for how the city will adapt to climate change. After becoming a signatory to the covenant, cities have up to three years to complete the GHG inventory, establish reduction targets, and develop a carbon action plan.

Source: https://data.bloomberglp.com/mayors/sites/14/2015/07/Compact-of-Mayors-Full-Guide_July2015.pdf

PHASE 1: REGISTER COMMITMENT[1]

- Mitigation
  - Cities commit to:
    - Measure community greenhouse gas emissions
    - Set data based targets to reduce GHG emissions
    - Develop a climate action plan showing how the city will deliver on its commitment to reduce greenhouse gas emissions and adapt to climate change.
- Adaptation
  - Cities commit to: Address the impacts of climate change by identifying climate hazards (e.g. drought, floods, etc.), assessing vulnerabilities based on geographic location (i.e. risks of damage from climate conditions, accomplished in Phase 2), and developing climate adaptation plans (i.e. how city will adjust to climate condition changes, accomplished in Phase 3)
- Reporting
  - After each year, at the end of each phase, cities are required to report progress to an online database (either the CPD of the Carbon*n* Climate Registry)*

PHASE 2: TAKE INVENTORY[1]

- Mitigation
  *Tools are available to use to complete a GHG inventory**
  - Within a year after making the commitment, cities must complete a partial GHG inventory by reporting on emissions in two sectors: stationary energy and in-boundary travel.
  - Complete a community-wide Greenhouse Gas (GHG) inventory using the GPC standard
    - GPC standard is a globally accepted way of performing a GHG inventory

- The GPC groups emissions into three scope categories. Scopes 1 and 2 include all GHG emissions within the city boundary and scope 3 includes all GHG emissions outside the city boundary as a result of activities within the city.

Scope 1	Scope 2	Scope 3
Agriculture, Forestry, & Other Land Use	Grid-supplied Energy	Transmission & Distribution of Grid Energy
Industrial Processes & Product Use		Out-of-boundary Waste & Wastewater
Stationary Fuel Combustion		Out-of-boundary Transportation
In-boundary Waste & Wastewater		Other Indirect Emissions
In-boundary Transportation		

- Tool Option 1: CIRIS (City Inventory Reporting and Information System)[10]
  - CIRIS is used to record activity and emissions data
    - In order to use this tool it is necessary to:
      - Define inventory boundary
      - Include population size and land area statistics
      - Record data sources and emission factors used in the inventory
- Tool Option 2: ClearPath[11]
  - ClearPath is an emissions inventory and management tool. Before using the tool, city emission data needs to be gathered.
  - Contains four modules: inventory, forecasting, planning, and monitoring.
    - Inventory module: Input inventory data to calculate overall emissions and produces reports by sector, scope, and source
    - Forecasting module: Forecast future emissions from data in inventory
    - Planning module: Analyzes emission reduction potential and financial impact
    - Monitoring module: Tracks emissions and offers improvements to align with climate action plans

PHASE 3: SET REDUCTION TARGETS[1]

- Must be completed within 2 years of commitment
- Mitigation
  - Update greenhouse gas inventory to include a breakdown of emissions from waste sector, including solid waste disposal, biological treatment of waste, incineration and open burning, and wastewater treatment and discharge
  - Set GHG reduction targets to indicate what level of emission reduction the City plans to achieve
    - Identify a baseline year from which progress will be measured
    - Determine a target year when the target will be achieved
      - E.g. a 20% reduction from 1995 levels by 2025

PHASE 4: PLAN[1]

- Mitigation
  - Develop climate action plan demonstrating how Oxford will commit to reducing GHG emissions
    - Minimum requirements:[2]
      - Political commitment
      - Vision describing city's overall ambition and clear objectives
      - Context*
      - Baseline GHG emissions
      - Business-as-usual GHG emissions forecast
      - GHG emissions reductions targets
      - Implementation plan
      - Monitoring plan
  - The CURB (Climate Action for Urban Sustainability) tool is used for both Phases 3 and 4
    - "Help guide cities through the process of planning and implementing a range of actions to reduce energy use, save money, and cut local greenhouse gas (GHG) emissions"[3]

Targeted Cities to Research

City / County / Town	City Population[A]	Approximate College/University Student Population[B]	Signatory City of the Global Covenant of Mayors (yes/no)	Phase(s) of the Global Covenant of Mayors completed	Sustainable measures / practices
Aspen, CO	6,658	20,000	Yes	Commitment	Canary Initiative[4]
Borough of West Chester, PA	19,189	16,600	Yes	Commitment	City council resolution (draft) for its vision towards a 100% clean renewable energy future[5]
San Luis Obispo, CA	46,377	21,300	Yes	Commitment	The City's Climate Action Plan[6]
Ithaca, NY	30,756	22,300	Yes	Commitment	1. Cities for Climate Protection (CCP) campaign, which is a program by ICLEI[7] 2. U.S Mayors Climate Protection Agreement (Feb. 2006)[7] 3. Local Action Plan to reduce GHGs (Jun. 2006)[7] 4. Energy Action Plan (Dec.2013)[7] 5. Climate Smart Community Pledge (2009)[7]
Athens, OH	66,186	20,900	No	---	1. Environmental and Sustainability Commission (established in 2012)[8] 2. Sustainability plan (2015)[8]
Bowling Green, OH	31,588	16,500	No	---	1. Solar field a. Capable of producing 20-megawatts of electricity[9] b. Avoids approx. 25,500 metric tons of CO_2 / yr.[9] 2. Wind turbine farm a. Capable of generating 7.2-megawatts of power[9]

[A] The city population is obtained from the Global Covenant of Mayors website or from the U.S. Census Bureau
[B] The approximate college/university student population is obtained from the website of the main college/university within each city, county, or town

* Further Research Needed:
- Reporting methods (Carbonn and CDP)
- Details of inventory: More information on sectors and specifics
- All tools in general:
  - Those from the Covenant that focus on the three scopes in the GPC standard
- Uncertain what "Context" means in Phase 4

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APPENDIX B: PROJECT CONTACTS

City	Contact name	Email
Aspen	Chris Menges	Chris.Menges@cityofaspen.com
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If a contact is listed, this means they responded to our inquiry. If a person's name is given, they gave permission for us to identify them. If there is no contact name listed we did not receive a response.

APPENDIX C: LIST OF COVENANT CITIES' TARGETS

City	Population	Baseline	Reduction	Target
Aspen, CO	6,658	2004	30%	2010
Montpelier, VT[1]	7,671		100%	2030
Burlington, VT[2a]	42,284	2010	10%	2025
Medford, MA[3]	57,437		100%	2050
Dubuque, IA	58,436	2003	50%	2030
Palo Alto, CA	66,955	1990	80%	2030
Somerville, MA[4]	78,901		100%	2050
Santa Monica, CA	92,987	1990	20%	2020
Boulder, CO	97,385	2005	80%	2050
Albany, NY[b]	98,566		10%	2030
Roanoke, VA[c]	99,428		10%	2019
West Palm Beach, FL[5]	104,031		100%	2050
Ann Arbor, MI	117,770	2000	25%	2025
Berkeley, CA	118,853	2000	80%	2050
Lakewood, CO	147,214	2017	20%	2025
Fort Collins, CO	156,480	2005	20%	2020
Eugene, OR	160,561	2010	50%	2030
Providence, RI[6]	177,994		100%	2050
Knoxville, TN	184,281	2005	20%	2020
Salt Lake City, UT	186,440	2009	80%	2040
Des Moines, IA[d]	203,433		80%	2050
Tacoma, WA	205,159	1990	40%	2020
Reno, NV	236,995	2008	80%	2050
Orlando, FL	255,483		90%	2040
Pittsburgh, PA[e]	305,841		20%	2023
Cleveland, OH	389,521	2010	10%	2016
Minneapolis, MN[f]	407,207		80%	2050
Oakland, CA	413,775	2005	36%	2020
Atlanta, GA	456,002	2009	20%	2020
Sonoma, CA	500,292	1990	25%	2020
Portland, OR	609,456	1990	80%	2050
Boston, MA	655,884	2005	25%	2020
Washington, DC	658,893	2006	50%	2032
Denver, CO[7]	663,862	1990		2020
Seattle, WA	684,451	2008	58%	2030
Austin, TX[8]	800,000		100%	2050
San Francisco, CA	820,000	1990	25%	2017
Columbus, OH	835,957	2013	20%	2020
Phoenix, AZ	1,451,966	2005	80%	2050
Philadelphia, PA	1,553,165	1990	20%	2015
Houston, TX	2,195,914	2007	80%	2050
Chicago, IL	2,830,000	1990	25%	2020
Los Angeles, CA	3,884,307	1990	45%	2025
New York City, NY	8,440,000	2005	80%	2050

[1] Net zero
[3]Boston Metro Mayors region-wide carbon neutral goal
[4]Carbon neutral
[5]Net zero emissions
[6]Carbon neutral
[7]Return to 1990 levels by 2020
*All sources unless specified: http://climatemayors.org/actions/climate-action-compendium/

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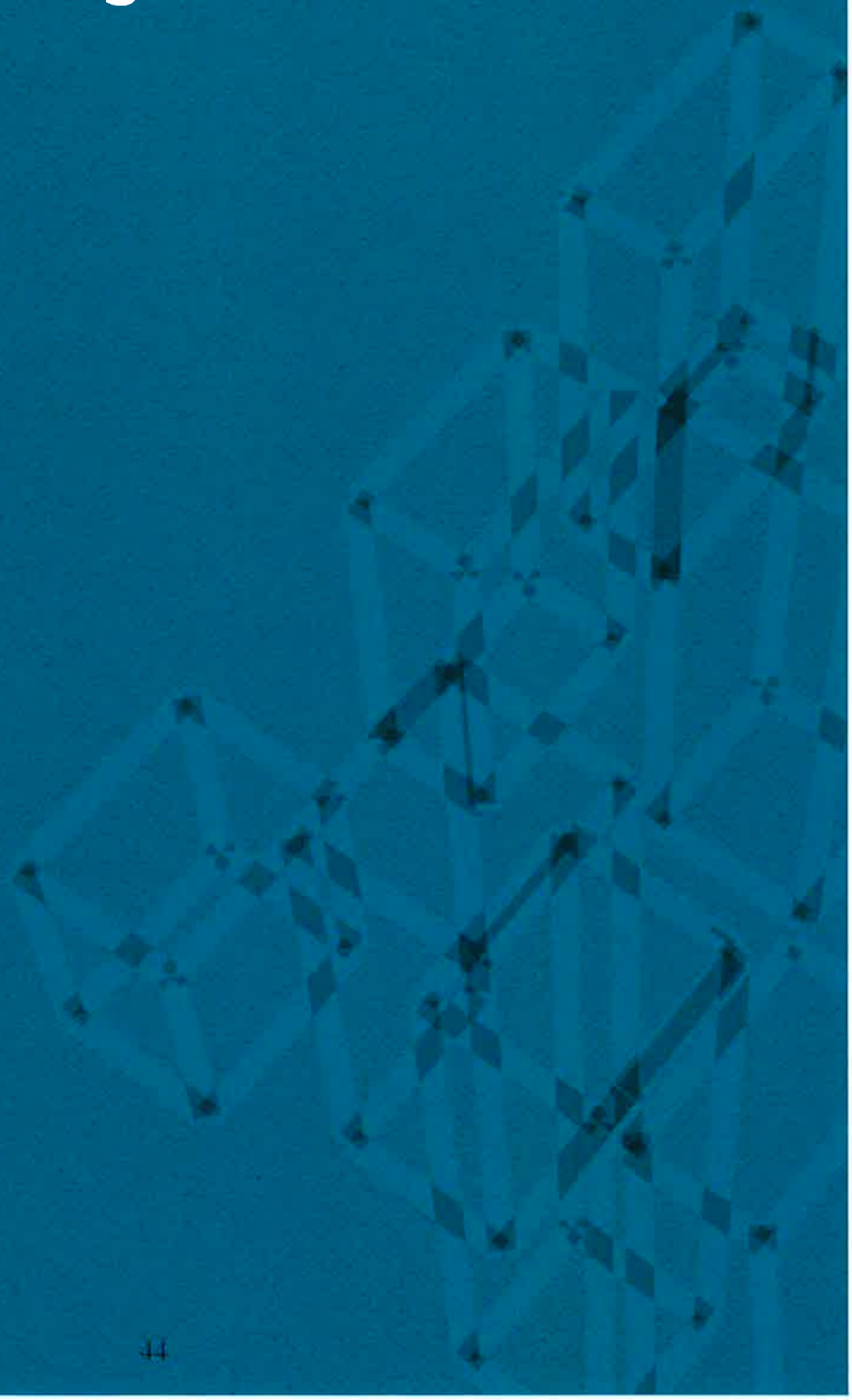
GOOD PRACTICE GUIDE

Municipal Building Efficiency



C40 CITIES
CLIMATE LEADERSHIP GROUP

C40 Cities Climate Leadership Group

The C40 Cities Climate Leadership Group, now in its 10th year, connects more than 80 of the world's greatest cities, representing 600+ million people and one quarter of the global economy. Created and led by cities, C40 is focused on tackling climate change and driving urban action that reduces greenhouse gas emissions and climate risks, while increasing the health, well-being and economic opportunities of urban citizens. www.c40.org

The C40 Cities Climate Leadership Group has developed a series of Good Practice Guides in areas critical for reducing greenhouse gas emissions and climate risk. The Guides provide an overview of the key benefits of a particular climate action and outline successful approaches and strategies cities can employ to implement or effectively scale up these actions. These Guides are based on the experience and lessons learned from C40 cities and on the findings and recommendations of leading organisations and research institutions engaged in these areas. The good practice approaches are relevant for cities engaged in C40 Networks as well as for other cities around the world.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Energy consumed in buildings accounts for almost half of the carbon emissions within C40 cities, of which one-third comes from public buildings.[i]

Cities around the world usually have a high degree of control over their municipal buildings, such as City Halls, government offices, hospitals, schools, libraries or museums. This authority provides city officials with a powerful opportunity to improve energy efficiency and reduce carbon emissions from their municipal buildings. Moreover, municipal building energy efficiency improvements can serve as a model for private buildings and inspire building owners to take action.

This Good Practice Guide focuses on the key elements to successfully deliver building energy efficiency in municipal buildings, leading to better economic, social, and environmental outcomes for cities. These good practice approaches include:

- **Assess baseline energy performance through modern data management**
- **Define an Energy Efficiency Strategy and set clear targets**
- **Set ambitious energy efficiency standards for municipal buildings**
- **Choose the right energy savings performance contract (EPC) model**
- **Demonstrate success of new technologies to create markets for energy efficiency**
- **Provide municipal facilitation and advisory for energy efficiency**
- **Raise awareness and promote behavioural change**

The C40 Municipal Building Efficiency Network was established to support C40 cities' efforts to improve the energy efficiency of the buildings they own, lease or manage by facilitating the sharing of good practice and technical expertise.

The purpose of this Good Practice Guide is to summarise the key elements of municipal building efficiency good practices for global dissemination, highlighting the success of C40 cities in planning and delivering building energy efficiency measures.

1 BACKGROUND

1.1 Purpose

C40 Cities Climate Leadership Group is developing a series of Good Practice Guides in areas critical for reducing GHG emissions and managing climate risks. The C40 Good Practice Guides provide an overview of the key benefits of a particular climate solution and outline good practice principles based on activities and strategies successfully employed by C40 cities. These Guides are based on the experience and lessons learned of C40 cities working together in specific C40 networks and also draw on findings and recommendations of leading organizations and research institutions engaged in these areas.

The following Good Practice Guide focuses on the key approaches to successfully improve energy efficiency in municipal buildings, with a survey of good practice principles leading to better economic, social, and environmental outcomes for cities. These approaches are drawn from the experiences of cities engaged in the C40 Municipal Building Efficiency Network and are relevant for cities around the world.

1.2 Introduction

Energy consumed in buildings accounts for almost half of the carbon emissions within C40 cities, of which one-third comes from public buildings.[ii]

Cities around the world usually have a high degree of control over their municipal buildings, such as City Halls, government offices, hospitals, schools, libraries or museums. This authority provides city officials with a powerful opportunity to improve energy efficiency and reduce carbon emissions from their municipal buildings. Moreover, municipal building energy efficiency improvements can serve as a model for private buildings and inspire building owners to take action.

2 MUNICIPAL BUILDING EFFICIENCY AND CLIMATE CHANGE

2.1 What is municipal building efficiency?

Municipalities often have a vast array of choices when trying to improve the energy efficiency of the buildings they own, lease or manage. To reap the energy efficiency benefits in municipal buildings local governments can adopt a range of technical solutions in the buildings they control. These technical solutions include high-performance building shells; efficient heating and cooling; sun control, shading and passive solar heating; efficient lighting and increased day-lighting; and smart system control technologies that optimize energy use within the building.

2.2 Benefits of municipal building efficiency

There are multiple benefits of municipal building energy efficiency, which help create a viable and attractive building energy efficiency project. These include:

Climate change mitigation - Improving municipal energy efficiency leads to reduced energy consumption, which in turn contributes to GHG emissions reduction and greater resource efficiency. Additionally, higher energy efficiency of municipal buildings (through efficient heating and appliances, for example) helps smooth-out energy demand by reducing the peak demand load and thus facilitates integration of renewable sources into the grid.

Economic savings - Lower energy consumption brought about by improving energy efficiency in municipal buildings means reduced requirements for energy infrastructure and fuel purchasing, thus directly saving money for the municipality and freeing up funds for other projects. Reduced energy consumption also leads to lower vulnerability to fossil fuel price shocks or resource delivery disruptions and improved energy security of the city in general.

Job creation - Delivery of municipal building efficiency projects creates new temporary and permanent green jobs and further supports employment through offering re-training opportunities.

Support to disadvantaged households - Higher energy efficiency in municipally owned residential buildings supports better and more affordable energy access for disadvantaged households. The impact of energy savings is even greater compared to average income households, as poorer households usually spend proportionally more money on energy than wealthier ones.

Improved health and well-being - Greater energy efficiency, particularly through improvements to insulation and the building envelope, often leads to improved comfort in office buildings, venues or social housing, as well as better outdoor air quality. Better insulation and efficient heating and cooling systems help prevent asthma and other diseases and reduces the level of indoor pollutants. Similarly, improved municipal building energy efficiency contributes to improved air quality in the city.

Governance benefits - Delivering municipal building efficiency projects can also contribute to spreading energy efficiency in other sectors (commercial, industry, private residential). Municipal projects can help create a market for energy efficiency solutions (such as new technologies or local providers) that need initial support and a demonstration project to establish a market position. Successful delivery of municipal building efficiency demonstration projects can also help lower perceived risks among private investors.

2.3 Challenges to delivering successful municipal building efficiency

There are a number of barriers that local governments might face when planning for and implementing municipal building efficiency projects. These include:

Multiple stakeholders - Energy efficiency improvement projects often require the collaboration of a large number of stakeholders. Multiple providers – construction companies, energy service companies, energy utilities - often need to come together to deliver building efficiency projects, requiring more management capacity from the local government. In particular, energy utilities might be reluctant to support energy efficiency projects, especially if their revenue comes simply from selling energy, without any financial compensation for promoting energy efficiency among their customers.

Market barriers - Market barriers can also discourage energy efficient investments. The value of energy efficiency projects might not be fully appreciated in areas with low energy tariffs or high fossil fuel subsidies.

Technical and technological challenges - A key technical challenge to delivering municipal building efficiency projects might be the lack of affordable and readily available energy efficiency technologies (or technical experience) suitable to local conditions, as well as longer-term maintenance capacity. At the same time, having to choose amongst a high number of competing equipment options (with a lack of modelling or scenario-building technology) and facing uncertainty about the building's projected performance can prevent successful delivery of the energy efficiency project.

Limited access to finance - Local governments that have a limited budget for energy efficiency or limited access to external credit might have limited ability to cope with the high up-front costs, dispersed operational benefits or limited investment returns of energy efficiency projects. External investors might also be discouraged by the generally high perceived complexity and risk of energy efficiency investments.

Limited institutional capacity or experience - Limited institutional capacity (including financial, staff, time and budget) of local governments could prevent them from gathering reliable and sufficient baseline information about the energy performance of buildings and their energy efficiency potential in case benchmarking studies are unavailable. Limited experience with similar projects might make it more difficult for the municipality to develop, implement, and maintain energy efficiency investments or attract investment. A lack of inter-departmental coordination could also lead to policy incoherence, conflicting goals and competition for funds. Finally, limited capacity to collaborate with the private sector within private-public partnerships can also reduce the financial viability of municipal building efficiency projects.

Lack of political support – An unfavourable political environment might also limit the local government's capacity to develop regulations, codes or standards supporting energy efficiency, especially if national legislation is a barrier or is ineffective at achieving energy efficiency goals.

Limited information and awareness – An awareness of energy efficiency benefits amongst city employees and the larger public is crucial for developing successful energy efficiency projects with lasting impacts. This is due to the fact that a large part of energy efficiency gains are

dependent on building occupants' behaviour. At the same time, awareness of energy efficiency benefits amongst the public can help create a favourable political platform and support for the creation of ambitious energy efficiency policies for the private sector as well.

3 GOOD PRACTICE APPROACHES TO MUNICIPAL BUILDING EFFICIENCY

3.1 Categories of Best Practice

Within the C40 Municipal Building Efficiency Network, at least seven distinct, but often complementary, management approaches have been identified for successfully improving energy efficiency in municipal buildings:

- **Assess baseline energy performance and track progress through data management**
- **Define an Energy Efficiency Strategy and set clear targets**
- **Set ambitious energy efficiency standards for municipal buildings**
- **Choose the right energy savings performance contracting model**
- **Demonstrate success of new technologies to create markets for energy efficiency**
- **Provide central advice on energy efficiency options**
- **Raise** awareness and promote behaviour change

C40 has identified case studies from cities in the Municipal Building Efficiency Network that highlight best practices in each of these categories.

3.2 Assess baseline energy performance through modern data management

The first step of a city is to assess their buildings' baseline energy performance. This will help the city to:

- Prioritise the policies and initiatives that will maximise energy use reductions from buildings;
- Set ambitious but realistic targets; and
- Build a robust strategy outlining how their climate goals can be met.

Case study: *Houston – Open energy performance data for municipal buildings*[iii]

Summary: The City of Houston is taking a multifaceted and data-based approach to ensure efficiency, cost-effectiveness and sustainability of its buildings, which make up 40% of the city administration's total energy use. The city's goal is to achieve 20% energy savings in municipal buildings by 2020. The city has conducted data collection and benchmarking of city facilities and publishes energy performance data for every municipal building over 25,000 square feet.

Results: The data covers 62 city-owned buildings representing more than 5 million square feet of space. Analysing this energy-use information allows the city to identify operational and

management improvements to increase energy efficiency, save money, and contribute to government transparency. Benchmarking enables a comparison of building performance over time, which in turn helps prioritize the facilities with the highest energy intensity and motivates appropriate action if building performance diminishes. Through benchmarking and subsequent retrofits, the city plans to achieve ENERGY STAR® certification and maintain the standard through continuous data monitoring. The energy consumption data was collected using the U.S. EPA ENERGY STAR Portfolio Manager software tool.[iv] The most recent (2013) site energy use intensity data for each building is available to the public online at: *http://houstoncityenergyproject.org/about/leading-by-example/*.

Reasons for success: The success of Houston's benchmarking approach is based on early recognition of the need to benchmark and monitor the whole portfolio of large municipal buildings, in order to be able to prioritise energy retrofits and/or bundle eligible projects together. In addition, making the energy performance data available to the public was recognised as key contributor to greater transparency and government accountability and important step to help motivate action among private building owners by demonstrating the success of the approach.

Case study: *New York City – Data-driven approach to municipal building efficiency*[v]

Summary: New York City has adopted a data-driven approach[vi] to deliver its '30x17 target' (30% GHG emissions reduction below 2005 levels by 2017). The city uses its benchmark results and other data sources to monitor building performance over time and prioritize energy efficiency projects. The city has also implemented its principal energy efficiency legislative package - the 'Greener, Greater Buildings Plan'[vii] (2009), expanded by 'One City: Built to Last'[viii] (2014) - requiring energy audits and cost-effective retrofit measures as well as promoting clean energy. The city evaluates the energy performance results regularly through extensive monitoring and year-to-year data analyses against benchmark baseline scores. These allow the city to identify the impact that different factors, such as energy efficiency investments, smart building management and occupant behaviour have on energy use.

Results: Local Law 84 of 2009 (part of the Greener, Greater Buildings Plan) requires reporting of benchmarking results for all buildings of at least 10,000 gross square feet that are owned by the city or for which the city pays the annual energy bills, as well as for private buildings over 25,000 gross square feet (around 2,300 square meters) from 2014. As of August 2015, around 11,800 facilities had been benchmarked,[ix] with those buildings identified as having the greatest opportunity for energy savings prioritised for retrofitting. To date, the city's building retrofit programme has resulted in over 190 energy efficiency projects, with annual energy cost reductions of around $10.5 million. The 'One City: Built to Last' programme takes this a stage further by targeting every government building requiring significant energy upgrades.

Reasons for success: The success of NYC's data approach is based on the comprehensive scope of the exercise, targeting a large number of buildings to create an extensive database allowing

for more robust benchmarking. Coupling the data-gathering with targeted energy audits also helps to diagnose specific problems and ensure more targeted retrofits.

When/why a city might apply an approach like this: Cities in general should adopt the comprehensive energy mapping and data-driven approach as a critical first step to improving energy efficiency in buildings. The approach provides a critical starting point and allows monitoring over time to help maximise energy efficiency and cost-effectiveness, ensure that retrofits are targeted most effectively and that energy efficiency investments achieve maximum value.

3.3 Define an Energy Efficiency Strategy and set clear targets

By setting a clear vision and targets, city governments can build awareness and encourage longer-term support for improving municipal building efficiency. Articulating energy efficiency, renewable energy, district energy and GHG emissions reduction targets not only provides clear long-term guidance and focuses political attention, but can also help overcome conflicting interests in different city departments and prioritise policies. As C40 research shows, cities are 3 times more likely to take action if a goal or target has been established.[x] A large number of cities around the world have successfully set targets and adopted Energy Efficiency Strategies and Action Plans.

Case study: *Toronto - Energy Conservation & Demand Management Plan*[xi]

Summary: In 2007, Toronto City Council adopted the "Climate Change, Clean Air and Sustainable Energy Action Plan" which committed to increasing energy efficiency at City facilities. In 2009, "The Power to Live Green" report was also adopted by City Council, in which it proposed an 80% reduction in GHG emissions by 2050 compared to 1990 levels. The most recent and targeted *Energy Conservation and Demand Management Plan* (ECDM) was adopted in July 2014. The plan takes a systematic approach to identifying energy conservation opportunities through classification of buildings and energy consumption benchmarking. The 10-year ECDM covers all city facilities, which alone spent over US$53 million on electricity and natural gas in 2012. The ECDM identifies opportunities with the potential to reduce energy consumption by up to 30% by 2019, leading to annual cost savings of over $17 million. This achieves an average payback period of less than 8 years through energy savings and utility company incentives.

Results: Successful programs such as the Better Buildings Partnership[xii] and the City's Energy Retrofit Program[xiii] have implemented over $100 million of energy-related projects. Other initiatives include installation of renewable energy facilities at Exhibition Place, the Enwave Deep Lake Water Cooling system, and policies such as the Toronto Green Standard.[xiv]

Reasons for success: Toronto has recognised the importance of target setting and strategy making to create long-term stability of business and investment expectations, as well as guide

local policies and initiatives in improving energy efficiency of the municipal portfolio. Benchmarking underlying the Plans and Strategies also helped quantify the economic and other benefits of energy efficiency measures, driving the necessary actions.

Case study: *Hong Kong – Energy Saving Plan 2015-2025+* [xv]

Summary: In Hong Kong, electricity consumption represents more than half of the city's total annual energy use, with buildings accounting for about 90% of the city's electricity use. In May 2015 Hong Kong's Environmental Bureau unveiled the Energy Saving Plan for the Built Environment 2015-2025+, which sets a new target of reducing Hong Kong's energy intensity by 40% by 2025. The plan analyses the city's energy use and sets out the strategy, policy and key actions that can help Hong Kong achieve the new target.

Results: Hong Kong's energy efficiency policy focuses on driving energy savings through a combination of educational, social, economic and regulatory initiatives. Apart from setting an ambitious city-wide goal, the Plan also requires the Hong Kong Government to take key actions, such as: set the target for all major new government buildings and new public housing to achieve at least BEAM Plus Gold and Gold ready standards[xvi] respectively; reach a 5% electricity reduction target for municipal buildings by 2020 (from a 2014 baseline); conduct periodic reviews to expand or tighten relevant energy-related standards including the statutory requirements under the Buildings Energy Efficiency Ordinance (2010), the Building (Energy Efficiency) Regulation (1995), and the Energy Efficiency (Labelling of Products) Ordinance (2008); update public education programmes and encourage public sector institutions to save energy; strengthen government energy saving efforts by appointing Green Managers and Energy Wardens; support community campaigns through government funding schemes; and cooperate with key commercial energy consumers to develop sector-specific campaigns to promote energy efficiency.

Reasons for success: The success of Hong Kong's Energy Saving Plan comes from the city's strong regulatory experience and history of effective enforcement. Additionally, by providing the underlying data for current energy consumption in the municipal building portfolio the city is able to show the potential for improvements and demonstrate the credibility of the targets.

When/why a city might apply an approach like this: Cities can define local targets to help streamline municipal building efficiency into urban planning and create a more stable policy environment to promote investor confidence. Where national building energy efficiency targets or legislation don't exist, outlining a strategy and targets at the municipal level can be even more important. In cities with limited building efficiency experience, clear targets can be particularly helpful in focusing political attention and generating the necessary momentum for municipal building efficiency improvements, while contributing to any city GHG emissions reduction targets.

3.4 Set ambitious energy efficiency standards for municipal buildings

Developing robust energy efficiency building codes and standards is one of the most efficient and cost-effective measures that cities can take to support the long-term energy efficiency of buildings.[xvii] Because of their proven benefits, many cities choose to mandate standards that go well beyond the national or state requirements. Certifications and ratings, such as LEED[xviii], BREEAM[xix] or ENERGY STAR[xx], also enable building owners to track and evaluate the performance of their buildings, while outlining opportunities for improvements.

Case study: *Washington DC – Green Code and energy efficiency certification*

Summary: With the adoption of the Green Building Act[xxi] (2006) and the Clean and Affordable Energy Act (2008), Washington DC became the first city in the U.S. to pass legislation that requires green building certification, as well as energy and water benchmarking, for both the public and private sectors. This policy legacy has prompted an impressive growth of green buildings and, as of January 2016, the city contained more than 119 million square feet of LEED-certified real estate from more than 650 LEED-certified projects.

However, realizing that building codes are a jurisdiction's primary opportunity to tailor specific mandatory requirements for all buildings, in March 2014, in addition to its adoption of the latest version of the International Energy Conservation Code, the city adopted the DC Green Construction Code[xxii] based on the International Green Construction Code (IgCC). It extends the scope of green building requirements to all commercial construction projects larger than 10,000 square feet and all residential projects that are at least 10,000 square feet and 4 stories or higher.

Results: The adoption of the comprehensive green code was possible thanks to an early engagement of relevant stakeholders from the private sector, careful consideration of local context and market conditions, and provisions for flexibility within the code. The new code was also adapted to the DC context and carefully integrated with all of the city's existing codes and regulations (e.g. DC Plumbing Code, Zoning Code, Stormwater Regulation, etc.). Sections that were duplicative of other initiatives were deleted or amendments to other codes were made.

The code also provides flexibility to deliver the requirements in different ways. For example, projects can elect to achieve the ASHRAE 189.1 standard or LEED, National Green Building Standard, or Enterprise Green Communities[xxiii] certification as an alternative to the code requirements. In addition to the standard required sections of the green code, DC adopted an amended version of the IgCC's Appendix A, from which project teams can choose a certain number of project electives from the overall list of possible electives.

Training has also been an important part of code implementation. Since 2012, more than 75 trainings have been given and several critical resources have been released, including a Green

Building Program Manual[xxiv] for green building policy in general, and standard code submittal templates[xxv] and sectional reference guides that aid in energy and green code compliance.

Reasons for success: The successful adoption of the ambitious DC Green Construction Code was possible thanks to a collaborative approach to its development and adoption, and strong commitment to implementation among private-sector stakeholders. Two existing instruments also facilitated the code's adoption and successful implementation, namely the Green Building Fund[xxvi] (funded by revenue from permit fees) and the Performance Bond & Binding Pledge[xxvii] (a penalty for non-compliance with green building certification).

When/why a city might apply an approach like this: Cities in general should consider this approach, especially to guarantee energy efficiency and green practices in new construction and major retrofits for municipal buildings and to spur similar action in private buildings. Before adopting a construction code with mandatory green building and energy efficiency standards, it is advisable to start with certification requirements for individual municipal projects to build administrative capacity, uncover in practice any potential conflicts with existing building and related codes, and demonstrate success of the approach. This can later facilitate integration of a green construction code within the existing regulatory environment.

3.5 Choose the right energy savings performance contract (EPC) model

Energy savings performance contracts (ESPCs), a type of public-private partnership (PPP),[xxviii] involve an energy service company (ESCO) that provides a client (local government) with a full range of services related to the adoption of energy efficient products, technologies, or services. ESPCs are well suited to more complex activities, such as renovating the existing municipal buildings portfolio or retrofitting streetlights, which require a range of customized solutions. ESCOs might also provide upfront financing of energy efficiency upgrades, so that the client can amortize the costs over time. In many cases, the ESCO's compensation is contingent on demonstrated performance, so that the services and equipment can be paid from the actual energy cost savings.

Global experience shows that ESPCs can be very effective for realising energy efficiency gains, since ESCOs have a business interest in ensuring that an energy efficiency project is actually implemented and saves energy. Many local governments have also been able to take advantage of their ability to bundle public-sector energy efficiency projects on a larger scale using ESPCs, thus reducing the administrative burden from having to develop, procure, and implement retrofits for one facility at a time. Bundled projects also allow ESCOs to benefit from economies-of-scale and lower their transaction costs. The C40 Municipal Building Efficiency Network has recently developed an ESPC library with case studies from around the world, sample ESPC contracts and detailed guides and handbooks.

A common concern raised by local governments is the lack of ESCOs operating in their city which can make it difficult to pursue ESPCs. In this case, municipalities can help drive market

development through the demonstration of stable demand for energy efficiency services, by issuing a series of bundled tenders for building energy efficiency projects, for example. The case studies below show three different ESPC models with more or less direct public involvement in the projects.[xxix]

Case study: Houston – Open tender ESPC[xxx]

Summary: In 2007, with the support of C40 Cities and the Clinton Climate Initiative,[xxxi] Houston initiated a large-scale energy efficiency retrofit programme to address all city buildings.[xxxii] 271 buildings (over 11 million square feet) are being retrofitted under an energy savings performance contract performed by Schneider Electric and Siemens. The goal is a 25% reduction in energy demand from buildings, which would save over 22 million kWh of electricity every year. The approach was to issue a single contract for all 271 buildings at the same time, split into in different tranches according to the building typology. This allowed the ESCO to optimize the interventions while benefiting from economies of scale.

Results: Over the last four years, retrofits of 87 city buildings have resulted in energy and operational savings averaging US$5.2 million a year. The results have exceeded original estimates, with an expected payback period of just ten years. The first six tranches of upgrades covered 4.3 million square feet, including police stations, health and parks facilities, and the city's main office tower. A new US$8.2 million project to upgrade 18 libraries and two other facilities is scheduled to finish in 2015, with expected savings of US$550,000 annually.

Reasons for success: The city government committed to retrofitting the whole municipal building portfolio through this initiative, which attracted leading firms that brought innovative and competitive solutions. Moreover, by going through the procurement process just once, the city streamlined the selection of firms and accelerated project implementation – thereby expediting the delivery of energy and cost savings in the buildings. Grouping similar building types into multiple-building tranches not only simplified the project management and finance by arranging it as one deal rather than several, but also exploited economies of scale and allowed for a blended project payback of up to 20 years. The city clearly defined its programme goals (e.g. minimum percentage of energy savings) as well as some specific aspects of the buildings that should be addressed (e.g. the building envelope) that the ESCOs had to address, which provided the ESCOs a working framework, while leaving space for maximum innovation and adaptation to building occupants' needs.

Case study: *Paris – Public-private co-management ESPC for schools retrofits*[xxxiii]

Summary: In 2007, the Municipality of Paris adopted its first Climate Plan, aimed at reducing the city's GHG emissions by 75% by 2050. One of the Climate Plan's goals is to reduce energy consumption and CO2 emissions in municipal buildings by 30% by 2020 from a 2004 baseline. Since Paris' primary and pre-schools comprise more than a quarter of all city-owned buildings and represent around 38% of energy consumption of municipal buildings, a School Retrofit

Project was included as part of the Climate Plan. This specific initiative is tasked with retrofitting 600 schools, with a target of 65GWh of energy savings per year.

In order to guarantee the savings, schools involved in the project are covered by energy efficiency contracts, signed between the public authority and an ESCO. The ESCO guarantees minimum savings in energy and is penalised if these targets are not met.

Results: The first contract (signed in December 2011 for 20 years) for 100 schools is being delivered through a private finance initiative (PFI). The ESCO pre-finances the initial work and starts being paid back by the public authority after all the works have been completed. The ESCO thus conducts the pre-work studies, carries out the work and delivers the maintenance and energy monitoring for the duration of the contract. The ESPC model Paris adopted involves partial sharing of responsibilities between the two contract parties. Thus, in 72 of the schools, the municipal technical employees are in charge of the maintenance, while the ESCO is responsible for providing their training. The ESCO is also required to educate school employees and pupils about eco-friendly measures.

An advantage of the PFI contract is that the 30% energy savings commitment is for the overall contract, i.e. a group of schools and not per school. This allows the ESCO to optimise its work programme across buildings and benefit from economies of scale. The retrofit of the first 100 schools is expected to lead to a reduction of 10.7 MWh of energy consumption per annum over the period 2014-2031, resulting in savings of 2,300 tonnes CO2 per annum. The first intermediate results indicate savings in excess of the 30% targets have already been achieved.[xxxiv]

Reasons for success: Bundling the city-owned school buildings into a single project has enabled Paris to benefit from economies of scale for the ESPC. The shared responsibility between the city and ESCO for buildings maintenance helped to transfer the ESCO's expertise to municipal employees via training, building municipal capacity for future projects.

Case study: *London – ESPC co-ordination by a dedicated RE:FIT Programme Delivery Unit*[xxxv]

Summary: London's public building retrofit programme (RE:FIT), aims to introduce energy efficiency retrofits in 40% of London's public buildings by 2025. All retrofits are coordinated by a RE:FIT Programme Delivery Unit (PDU) and initiated under guaranteed-savings contracts (ESPCs) by ESCOs. The ESCO guarantees a set level of energy and water savings, resulting in a financial saving over the period of the arrangement, while also taking responsibility for the risk associated with the delivery of energy savings. The programme streamlines the procurement process by providing standardised, EU-regulation compliant framework contracts for the design and implementation of energy-conservation measures. This simplifies the process for public sector clients and also reduces supplier bidding costs and time, thereby reducing costs for both parties. Moreover, the model allows for buildings to be grouped for retrofitting, facilitating greater energy, carbon and monetary savings through economies of scale.

The unique feature of the London RE:FIT model is the creation of the RE:FIT Programme Delivery Unit (PDU) in February 2011, facilitated by European Commission funding under the ELENA Programme. The Unit manages the RE:FIT framework and promotes the programme's uptake by London-based public sector organisations. It also provides specific support throughout the RE:FIT process, from providing initial information to verifying energy savings once the project has been delivered.

Results: RE:FIT is now being used by more than 160 of London's public sector bodies, including 28 of the 33 London Boroughs, 23 NHS organisations and 109 other organisations (retrofitting government buildings, schools, libraries, museums, etc.). A pilot retrofit programme to reduce energy use in 42 public buildings, implemented from 2008 to 2010, resulted in overall energy cost savings of £1 million per year against a total investment of £7 million. This encouraged the Greater London Authority (GLA) to expand the programme eligibility to all city public buildings (as of 2012, 111 buildings have been retrofitted),[xxxvi] while aiming to retrofit 600 buildings and generate estimated savings of 45,000 t-CO2 by the end of 2015.

Reasons for success: Economies of scale were created through bundling together a number of energy efficiency projects. London also benefitted from external funding (EU ELENA Programme), as well as from strong institutional capacity and experience with complex projects to launch its RE:FIT PDU. The city was therefore able to streamline energy efficiency improvement projects across the city departments and agencies at lower cost, by keeping the expertise and capacity "in-house".

When/why a city might apply an approach like this: Cities considering comprehensive municipal buildings retrofits should exploit the opportunities of bundling projects together and engaging an expert ESCO to reduce the cost and risks associated with such a programme. Different ESPC models can be applied depending on the city characteristics, such as: regulatory powers; financing capacity; risk tolerance; and the degree of access to low-cost finance.

3.6 Demonstrate success of new technologies to create markets for energy efficiency

Cities can partner with local businesses and research institutes to exploit the natural advantages of cities as a proving ground for new energy efficient technologies. Cooperation between business and local authorities can support the development of new innovative technologies (such as sensors, controls, smart thermostats, energy consumption visualization, etc.) by creating the necessary research facilities and encouraging commercialization through the introduction of incentives and enabling regulation.[xxxvii]

Case study: *Wuhan - Wuhan New Energy Research Institute*[xxxviii]

Summary: Wuhan has recently completed the construction of the Wuhan New Energy Research Institute Centre, one of the most advanced energy efficient buildings in the world. The

institute's 140m-high main building (Wuhan Energy Flower) is designed according to the U.K. BREEAM standard and the "China Green 3-star" standard. The project is a world-leading building with zero fossil-fuel energy consumption and zero net carbon emissions, and is also the largest green building in China. Equally important is the role of the building as it houses the New Energy Research Centre containing over 2,000 sustainable engineering students and researchers dedicated to delivering new innovations in the field of green technology.

Results: The Wuhan Energy Flower is a low-energy consumption building, which harnesses rainwater and uses wind and solar energy to cover its energy needs (annual electricity produced by wind and sunlight is estimated at 480,000 KWh). The design of the building is adapted to the local subtropical climate, where temperatures peak at 45°C and the air is hot and humid for half of the year. The building is designed with an overhanging roof to maximise shading of the glass-fronted southern façade, which otherwise allows for maximum day lighting. In winter, the south-facing offices get direct sunlight, as the sun is lower in the sky. The large overhanging roof, tilted towards the sun, is covered with 3,500 m^2 of PV solar panels, generating electricity for the local grid. A 57m-high steel framed pillar emerges from the centre of the building and contains a vertical wind turbine. It also enables the building's "mixed-mode" natural ventilation: air is heated by the sun in a 3m-diameter tube made of black aluminium panels at the base of the pillar, which is connected to a central duct running vertically through the centre of the whole building. As hot air rises through the central shaft, the stack effect causes air to be sucked through the building via window openings, helping to ventilate the space. The system is supported by two HVAC units, serving as backup. The building also has a rainwater harvesting system, providing water to toilets and a rooftop garden (38% of water used in the building is reclaimed water).

Reasons for success: A strong partnership between the City of Wuhan and the New Energy Research Institute, combined with the high standards during the procurement process, enabled the creation of the world-class low-energy building, serving as a demonstration of viability of new technologies.

Case study: *Stockholm – Green IT Strategy*[xxxix]

Summary: Stockholm has identified considerable potential for increasing energy efficiency and reducing greenhouse gas emissions through the implementation of new technical solutions within city-owned properties, in particular through Green IT. Green IT involves using information technology to reduce the environmental impact of buildings in general, as well as the energy consumption and environmental impacts of the IT sector itself. Stockholm's Green IT Strategy[xl] (2009), aims to create "a citywide, standardised and modern IT infrastructure" that enables the GHG emissions from municipal operations to be minimised. The city's goal is to reduce its operating costs, through reducing energy usage by 10% below 2006 levels. The Strategy describes the most important goals, the necessary related actions, and the results that the city expects to achieve. There are at least 9 'action areas' in the Green IT Strategy that directly relate to buildings and office efficiency, including: energy-efficient buildings (HVAC

adjustments); visualization of energy and electricity usage (including individual metering and charging); digital meetings; digital document processing; greener IT sector (eco-friendly and cost-efficient IT procurement); green data centres and telecommunications; standardized energy-efficient workplaces; and more efficient printouts.

Results: An example of Stockholm's Green IT strategy with respect to building energy management is the Östra Real upper secondary school, which is built above the broadband cross-connection hub. Around 60 broadband operators use the hub, with the heat produced by the operations channelled into the school above via a heat exchanger. The underground room is cooled by a geothermal cooling system. The school thus benefits from 100 kW of extra heat, supplying 10% of its needs during the winter, and all of its heating in the summer.

Reasons for success: Stockholm builds on its experience with innovative and smart technologies to streamline the energy efficiency of the IT sector, as well as using IT to improve energy efficiency of the municipal building portfolio. Smart technologies can substitute for part of the building users' behaviour necessary to maximise building energy efficiency

When/why a city might apply an approach like this: Cities aiming to stimulate local energy efficiency markets have an important role to play in educating the market about the technologies' benefits, demonstrating the proof of concept, ensuring a supportive regulatory environment and/or even providing finance. In exchange, cities can benefit from driving down their own project costs through partnerships with innovative companies.

3.7 Provide municipal facilitation and advisory for energy efficiency

As the New Climate Economy reports show, cities have a key role to play in establishing sound governance frameworks, "implemented through effective and accountable institutions that support the coordinated planning and implementation of programmes of activity and investment across public and private sectors and civil society."[xli] Cities can deliver efficient policy planning through inter-departmental and inter-municipal coordination[xlii], as well as coordinate specific projects amongst city agencies and through public-private partnerships. Cities can also provide expertise and advice to local stakeholders and private actors. Finally, cities can benefit from inter-city collaboration within international networks such as C40, which provide for peer learning and best practice dissemination.

Case study: *Tshwane – Specialist assistance Sustainability Unit*[xliii]

Summary: The City of Tshwane established the City Sustainability Unit in 2013. Located within the Office of the Executive Mayor, its mandate is to assist the city in "developing a green economy strategy for the city and guide the process of transitioning into a low carbon, resource efficient and climate resilient city in line with the objectives and targets set in the Tshwane Vision 2055."[xliv] The unit's role is to coordinate between departments and assist in facilitating access to external funding for green economy projects, including municipal building efficiency.

Results: The City Sustainability Unit works in collaboration with other departments to implement their own green economy projects guided by the Vision 2055[xlv]. It has the benefit of addressing crosscutting issues and discouraging a silo approach in the different city departments. The unit also implements test cases and demonstration programmes (including introduction of new technologies) and hands these over to the relevant departments once a project is at a mature stage in development. The Unit also works to enhance the level of awareness and capacity for local representatives and citizens through stakeholder programmes and collaborative partnerships. A sustainability task team of representatives from key departments has been established within the Unit to align the different green economy programmes of the city by enabling inter-departmental communication and collaboration on crosscutting projects and streamline energy efficiency throughout the city initiatives.

Reasons for success: The success of the City Sustainability Unit comes from Tshwane's recognition of sustainability and energy efficiency as an issue integral to all sectors and municipal agencies. The Unit builds on its inter-departmental and crosscutting approach, centralising and spreading expertise, policy support, and technology innovation.

Case study: *Stockholm – Energy Centre for expert support to energy efficiency measures*[xlvi]

Summary: Founded in 2005, Stockholm's Energy Centre has provided expert support on the implementation of energy efficiency measures in municipal buildings, disseminating knowledge within the city, engaging with construction companies and checking progress against the 10% energy saving target set by the Stockholm Environment Programme 2012-2015.[xlvii] In 2015 the City Council decided on a new GHG emissions reduction target of 57% per capita, to be achieved by 2020 compared to 1990, and a new energy saving target of 10% over 2016-2019. These targets will be included in Stockholm Environment Programme 2016-2019. Stockholm's long-term goal is to become a "fossil fuel free city" by 2040.

Results: The Centre's expert support on the implementation of energy efficiency measures includes testing innovative technologies (e.g. heat recovery from ventilation and sewage water, thermal insulation, LED-lighting, etc.), introduction of energy management systems, knowledge gathering and dissemination within the city, and R&D projects. The Centre also collects critical data, including the energy mapping of all city buildings. An illustrative example is the Energy Centre's cooperation with the Real Estate Administration. The Energy Centre financed part of the first energy audits, assisted in securing extra financing for the Real Estate Administration from the city budget of an additional €20 million for employing in-house expertise and complete the project. Around 50% of the Real Estate Administration's building stock was targeted, which led to annual energy savings of about 30% (8 GWh_{heat} and 1,5 $GWh_{electricity}$) and annual financial savings of around €0,8 million in less energy costs. An important financial saving factor is less less future maintenance costs.

During the first three years of the current Environment Programme the city has reduced the energy consumption by 8% and the 10% target is considered achievable. Very much due to the expert support from the Energy Centre, but above all the ambition of all relevant bodies in the city to reach the target. The 8% reduction corresponds to an accumulated cost saving of about €20 million during the three years.

Reasons for success: Stockholm recognised the importance of inter-departmental cooperation and the potential for synergies to deliver cost savings. The Energy Centre allows the city to build municipal capacity and deliver energy efficiency projects amongst its agencies without replicating efforts and processes. Central coordination of energy efficiency projects within the municipality and the potential for replication of successful projects amongst the agencies also creates greater investor confidence and helps secure additional external funding.

When/why a city might apply an approach like this: Cities with long-term energy efficiency targets and/or a large potential for energy savings in the municipal portfolio should consider creating a specialist advisory unit to offer expert support across different municipal departments and agencies. This unit would build capacity, integrate regulations and standards and open up the opportunities to attract larger financing or develop ambitious energy savings performance contracts.

3.8 Raise awareness and promote behavioural change

Cities can provide leadership in reducing municipal building emissions, not only by improving the fabric of a building, but also by working with building occupants, to promote more energy efficient behaviour. It is estimated that up to 30% of energy demand is due to behaviour – including energy use habits and the purchase of energy using technologies.[xlviii] Thus, finding an effective way to engage people is essential for the success of any energy management programme. Cities have been designing various strategies to engage their staff, including specialised training and various awareness raising programs.

Case study: *City of Cape Town - Customised training and awareness raising*[xlix]

Summary: The City of Cape Town has a holistic approach to implementing energy efficiency in its buildings, including the implementation of smart meters and data monitoring systems coupled with energy efficiency interventions. The city has also established an *Environmental Education, Training and Awareness Strategy* to promote behaviour change. Training of key employees was identified as critical to ensuring the sustainability of the energy efficiency programme.[l] The city hired a private company to train its facility managers on the fundamentals of energy management, requiring that the service provider include a practical component in the training to ensure that the concepts taught are understood by the employees. The city also developed a training guide on how to collect, interpret and act upon the smart meter data.

Results: The focus of the training was for non-technical staff, such as facility managers, building operators and maintenance staff. The city has trained 45 of its building facility managers to date, who are now better prepared to deliver sustainable management of their facilities.

Reasons for success: The success of Cape Town's customised training was built on recognition of the importance of behaviour change and awareness for delivering sustainable municipal building energy efficiency improvements. By incorporating practical elements into the training, the city and its partners ensured the lasting impact of the training and potential for spreading the message among other employees.

When/why a city might apply an approach like this: Any city aiming to improve municipal building efficiency should consider pro-actively training staff and educating stakeholders about energy efficiency and its benefits, as behaviour has large and direct impact on energy consumption. By engaging the broader public and private sector through information campaigns and awareness-raising efforts, the city can also build a wider support for energy efficiency and stimulate local markets.

4 FURTHER READING

For further information, more detailed technical guidelines on specific stages of municipal building energy efficiency planning, options for PPPs and more, you can also refer to the following publications:

- WRI (2015). Accelerating Action in Cities for Efficient Buildings: An Introductory Guidebook for Local Government Decision-Makers. *World Resource Institute*. Available soon
- EPEC (2012). Guidance on Energy Efficiency in Public Buildings. *European PPP Expertise Centre*. Available at: http://www.eib.org/epec/resources/epec_guidance_ee_public_buildings_en.pdf
- ESMAP (2015). *Analytical Tools for Municipal Energy Efficiency Planning*. Available at: http://www.esmap.org/node/378
- IEA (2013). *Transition to Sustainable Buildings. Strategies and Opportunities to 2050*. Available at: https://www.iea.org/media/training/presentations/etw2014/publications/Sustainable_Buildings_2013.pdf

[i] C40 (2015). Municipal Building Efficiency Network. Available at: http://www.c40.org/networks/municipal-building-efficiency
[ii] C40 (2015). Municipal Building Efficiency Network. Available at: http://www.c40.org/networks/municipal-building-efficiency
[iii] http://houstoncityenergyproject.org/about/leading-by-example/
[iv] http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager
[v] http://www.c40.org/case_studies/new-york-city-government-leading-by-example

[vi] http://database.aceee.org/city/new-york-city-ny
[vii] http://www.nyc.gov/html/gbee/html/plan/plan.shtml
[viii] http://www.nyc.gov/html/builttolast/pages/home/home.shtml
[ix] http://www.nyc.gov/html/gbee/html/plan/ll84_scores.shtml
[x] http://www.c40.org/blog_posts/10-years-of-results-c40-by-the-numbers
[xi] https://www1.toronto.ca/City Of Toronto/Environment and Energy/Action Plans, Policies & Research/PDFs/City of Toronto ECDM (2014-2019).pdf
[xii] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=6bb5136696f85410VgnVCM10000071d60f89RCRD
[xiii] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=7e00643063fe7410VgnVCM10000071d60f89RCRD
[xiv] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=f85552cc66061410VgnVCM10000071d60f89RCRD
[xv] http://www.enb.gov.hk/sites/default/files/pdf/EnergySavingPlanEn.pdf
[xvi] https://www.hkgbc.org.hk/eng/BEAMPlus_NBEB.aspx
[xvii] http://www.breeam.com/filelibrary/Presentations/DeliveringSustainableBuildingsSlides.pdf
[xviii] http://leed.usgbc.org
[xix] http://www.breeam.com
[xx] https://www.energystar.gov/buildings/program-administrators/state-and-local-governments
[xxi] http://doee.dc.gov/publication/green-building-act-2006
[xxii] http://www.ecodes.biz/ecodes_support/Free_Resources/2013DistrictofColumbia/13Green/13DCGreen_main.html
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[xxvi] http://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/20140113_Green Building Report 2012_FINAL.pdf
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[xxix] *ibid.*
[xxx] https://www.c40exchange.org/display/LIB/Municipal+Buildings+Energy+Efficiency#sectionId=583504014
[xxxi] http://c40-production-images.s3.amazonaws.com/case_studies/images/84_City_20of_20Houston_20Case_20Study.original.pdf?1389916742
[xxxii] http://www.c40.org/case_studies/houston-building-retrofit-program-tranche-2-results
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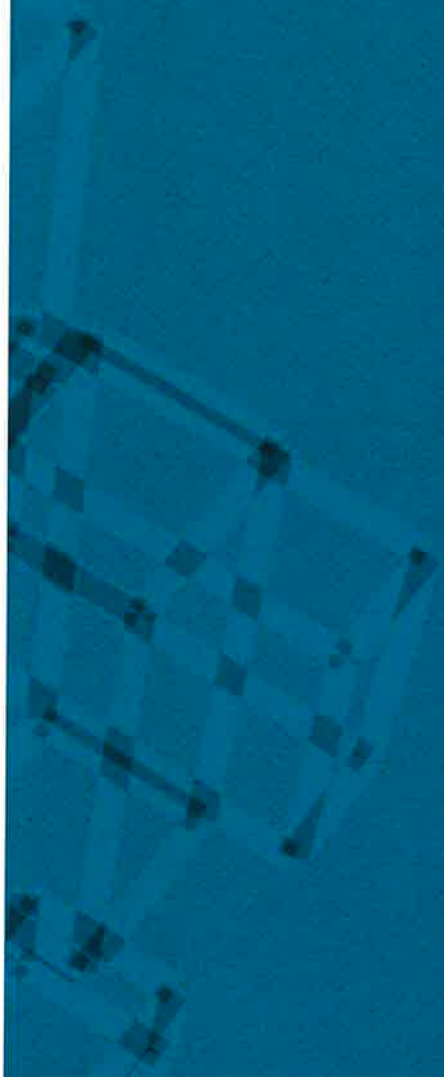

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APPENDIX E: USEPA GHG INVENTORY SOURCES

Table 1. Required Data Inputs for the Local Greenhouse Gas Inventory Tool: Government Operations Module —Inventory Calculations

GHG Sectors	Input Data
Stationary Combustion of Fossil Fuels (i.e., fuel use at city facilities)	Stationary fuel use (by fuel type)
Electricity Consumption	Electricity consumed (kWh) Electric utility
Mobile Combustion of Fossil Fuels (i.e., fuel use by city fleet)	Fuel consumed (by fuel type) (gallons or G.G.E.) Vehicle Miles Traveled (miles) Vehicle Model Year Vehicle Type
Solid Waste Management	City Landfills (number) Landfill Gas Collected (MMSCF/yr) Fraction of CH_4 in landfill gas Landfill Gas Collection Area (fraction)
Wastewater Treatment	Wastewater treatment process details (aerobic, anaerobic, nitrification, denitrification) Population served by wastewater treatment system(s) (people) Population served by septic systems (people) Digester gas produced daily (ft^3/day) Fraction of CH_4 in biogas System BOD_5 load/influent (kg BOD_5/day) Fraction BOD_5 removed in primary treatment Industrial Nitrogen load (kg N/day) Average total Nitrogen discharged (kg N/day)
Employee Commute	Number of employees (people) Employees who use each mode of transit (%) Average one-way commute length (miles) Work days per year (days/yr)
Agriculture & Land Management	Synthetic fertilizer use (short tons N) Organic fertilizer use (short tons) Manure fertilizer use (short tons)
Urban Forestry	Total urban area (km^2) Urban area with tree cover (%)
Waste Generation	Waste emissions ($MTCO_2e$ from EPA's Waste Reduction Model) Department contribution to total waste (%)
Water Use	Percentage of imported water (%) Water use (gallons)
Additional Emission Sources	GHG emissions from each additional source, by gas (MT CO_2e)

Table 1. Required Data Inputs for the Community Module—Inventory Calculations

GHG Sectors	Input Data
Stationary Combustion of Fossil Fuels (e.g. fuel use at residential, commercial, industrial, and electric generating facilities)	Stationary fuel use (by fuel type, by sector)
Electricity Consumption	Electricity consumed (kWh) Electric utility
Mobile Combustion of Fossil Fuels (e.g. fuel use by vehicles)	Fuel consumed (by fuel type) (gallons or G.G.E.) Vehicle Miles Traveled (miles) Vehicle Model Year Vehicle Type
Solid Waste Management	City Landfills (number) Landfill Gas Collected (MMSCF/yr) Fraction of CH_4 in landfill gas Landfill Gas Collection Area (fraction)
Wastewater Treatment	Wastewater treatment process details (aerobic, anaerobic, nitrification, denitrification) Population served by wastewater treatment system(s) (people) Population served by septic systems (people) Digester gas produced daily (ft^3/day) Fraction of CH_4 in biogas System BOD_5 load/influent (kg BOD_5/day) Fraction BOD_5 removed in primary treatment Industrial Nitrogen load (kg N/day) Average total Nitrogen discharged (kg N/day)
Agriculture & Land Management	Synthetic fertilizer use (short tons N) Organic fertilizer use (short tons) Manure fertilizer use (short tons)
Urban Forestry	Total urban area (km^2) Urban area with tree cover (%)
Waste Generation	Waste emissions ($MTCO_2e$ from EPA's Waste Reduction Model) Sector contribution to total waste (%)
Water Use	Percentage of imported water (%) Water use (gallons)
Additional Emission Sources	GHG emissions from each additional source, by gas (MT CO_2e)