MOBILIZE FREDERICK

MID-TERM REPORT

to

FREDERICK COUNTY COUNCIL, FREDERICK CITY ALDERPERSONS

FEBRUARY 23, 2021

MOBILIZE FREDERICK
CLIMATE EMERGENCY MOBILIZATION WORKGROUP
FREDERICK. MARYLAND

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Preface

The Climate Emergency Mobilization Work Group (CEMWG) is a joint Frederick County - Frederick City work group authorized by the County Council, the Mayor, and Board of Alderman through the Climate Emergency Resolutions adopted in 2020 (Frederick County Climate Emergency Resolution 20-22; City of Frederick Climate Emergency Resolution 20-07).

The charge of the work group is to consider four main Climate Emergency concerns of specific relevance to Frederick County and City:

- Energy, Transportation and Buildings
- Agriculture, Forestry and Sequestration
- Health and Extreme Weather Adaptation and Resilience
- Public Engagement and Education

The purpose of this report is to present the status of CEMWG deliberations and progress to the County Council and City Mayor and Aldermen six months after the first meeting, as required by the Resolutions. The final report, due in mid-August, will include legislative, administrative, and community recommendations to assist the County and City with meeting the goals of these Resolutions, which are to: 1) implement policy and legislative actions through the lens of climate change; 2) reduce county- and city-wide greenhouse gas (GHG) emissions 50% from 2010 levels by 2030 and 100% no later than 2050, and employ efforts to safely draw down carbon from the atmosphere.

This mid-term report will describe the recruitment, structure, and methodology of the CEWMG, key findings discovered through the first half of the project, ideas for further explorations, stakeholder engagement efforts, and the anticipated focus for the six months ahead.

This report is a result of the hard work and deep commitment of more than 55 members of the Frederick County and City communities. These volunteers represent every corner of Frederick County and most impacted stakeholder groups. They have responded enthusiastically to the call to serve, represent a broad range of scientific, planning, policy, funding and communications expertise on the topic of climate change, and have donated an estimated 8500 volunteer hours toward this effort. Their many indispensable and significant contributions cannot be overstated. Bios of CEMWG members are located here: https://www.mobilizefrederick.org/who-we-are.

On behalf of the entire membership of the CEMWG and its subgroups, we are grateful for the opportunity to present this report and look forward to questions and engagement on these issues.

Respectfully Submitted - Barb Trader and Kevin Sellner, CEMWG Co-Chairs

Introduction

Traditionally, the conversation around addressing climate change has been focused on two themes, with one side talking about how expensive addressing it would be and the other side talking about saving the planet. Both of these narratives are dated, and, more importantly, incorrect. From a cost perspective, sustainable solutions are increasingly the least expensive option when both upfront and monthly operating costs are considered. These savings are even more apparent when including those anticipated by avoiding or reducing future damage from extreme weather and other climate change impacts. Following initial investments, substantial cost savings are anticipated for both government functions and for residents. For example, Drawdown Georgia estimates that a $140 million investment in 20 climate solutions by 2030 will result in a $12 billion in total savings for the state and its residents.[1] Likewise, the Global Commission on the Economy and Climate, which has conducted the most authoritative research to date, has estimated that humanity could save $26 trillion by 2030 through a global shift to sustainable development.[2]

On the other side, addressing climate change isn't about saving the planet. The earth will continue to exist no matter what we do. However, will the biosphere on earth be one that is healthy and supportive of a decent quality of human life? A world and a community that addresses climate change will have healthier children and adults, fewer lost school and work days caused by asthma and other climate-related diseases, and fewer extreme weather events than we would have with the status quo. Climate solutions also help address the staggering costs and equity issues for poor and minority communities. These communities are too often sacrificed with the placement of polluting and toxic facilities in their midst, causing burdensome health and economic hardships. Our community will enjoy a higher quality of life, greater health, improved and sustained economic stability and success, and more equity by addressing climate change with the vigor and attention it requires. These are the compelling reasons driving the work of the Climate Emergency Mobilization Workgroup.

In recognition of these realities, the City of Frederick Alderpersons adopted the Climate Emergency Resolution on March 11, 2020 and the Frederick County County Council adopted its version on July 23, 2020. These climate resolutions were the 92nd and the 100th, respectively, to be adopted in the United States. Although the resolutions differ slightly, the intent of the sponsors, Councilwoman Fitzwater, Councilman Hagen, and Alderman MacShane, was to form a joint workgroup (Climate Emergency Mobilization Work Group, CEMWG) to carry out the charge described below. Within a week of the County's adoption, workgroup co-chairs Barb Trader and Kevin Sellner were appointed and a call for volunteers was distributed through the *Frederick News Post*, various Facebook pages, Council and Board of Aldermen dissemination, and targeted outreach to various stakeholder groups. By August 6th, more than 70 applications for positions on the workgroup were received. Members were selected based on their professional expertise, geographic representation, demographic diversity, and reasons given for participation.

[1] https://blog.drawdownga.org/exploring-the-science-behind-drawdown-georgia
[2] https://newclimateeconomy.report/2018/

The CEMWG is the main working body of the project, with open public meetings, minutes, presentations, and public comment period. Its 17 members have broad professional expertise, represent multiple industrial or commercial sectors of the community as well as the ethnic diversity from the City's and County's population. Its deliberations and decisions on final report content are informed by four sub-groups: Agriculture, Forestry, and Land Management (AFL), Energy, Transportation, and Buildings (ETB), Health, Extreme Weather Events, and Resilience (HWR), and Public Awareness and Outreach (PAO). The co-chairs prepared for the initial meeting of the CEMWG by describing group operating principles and a project timeline with milestone dates. The Workgroup's operating principles include a commitment to science-based solutions, non-partisan deliberations, active solicitation and consideration of stakeholder input throughout the process, equitable benefit from solutions, and a resulting set of recommendations that are practical and relevant to local concerns.

The CEMWG has met twice each month since August 27th (with the exception of once in December) from 5:00 - 7:00 pm on the second and fourth Thursday of each month. Seventeen individuals comprise the CEMWG, with an average attendance of 82%. These bimonthly meetings often feature a subject matter expert and include progress reports from subgroups as well as consensus-driven problem-solving discussions about processes to employ, such as priority setting. The first speakers featured were Jenny Willoughby, Sustainability Manager for the City of Frederick and Shannon Moore, Frederick County Office of Sustainability and Environmental Resources Manager. Ms. Moore was accompanied by Jeffrey King, Principal Environmental Planner, Metropolitan Washington Council of Governments (COG), who coordinates consulting to the County and City related to their understanding of greenhouse gas (GHG) emissions, metrics, and climate action planning. A full list of speakers and topics are included in Appendix A. Meetings are open to the public, made possible from support by the County Council's administrative staff, and can be viewed live by the public through the Public Portal and Facebook.

Each subgroup is chaired or co-chaired by members of the CEMWG and include initial applicants as well as individuals specifically recruited for their expertise from area universities, including Johns Hopkins and University of Maryland. These subgroups meet at least twice per month and, in some cases, also have smaller work groups underway.

CEMWG's website is https://www.mobilizefrederick.org/.
To view the CEMWG Mobilize Frederick Twitter Account click here
To view the CEMWG Mobilize Frederick Facebook Account click here

Methods and Approaches

The subgroups described above are implementing approaches that are most relevant to their topical areas. AFL and ETB members focus their deliberations and activities on GHG emission reductions while HWR addresses potential remedies or adaptations to reduce climate impacts on public health, residents' properties and businesses, and the environment. PAO uses its communication skills through all media forms, including the web, printed matter, radio and television, social media, and phone dialog to educate the residents and businesses on the new

climate we now face, often seeking opinions of individuals and organizations and learning what they are already considering or doing to adjust to increasing temperatures, extreme rains, or drought.

Once the CEWMG subgroups were formed, they began to conduct research specific to other jurisdictions' local efforts to address climate change, from urban to rural landscapes, multiple industries, and diverse demographics. Thereafter, individual sub-groups began assembling impacts to be explored in their respective focus areas, such as crops, forests, soils, greening of lands for AFL, electrification, finance, and codes in ETB, immediate threats from heat and extreme weather in HWR, and communication and engagement options in PAO. Smaller groups within AFL and PAO have split out to focus on individual themes (see sub-group summaries below).

CEMWG members recognize that there are many recommendations that could be developed, (for example, Montgomery County had >830 ideas for action in their initial climate plan), but we anticipate submitting only a fraction of this number of recommendations to be presented to the County and City in September, identified by using prioritization criteria. A list of six Benefit Criteria and five Implementation Criteria has evolved to assist this characterization schema. Sub-groups are testing their identified issues and topics through this process to develop confidence in the rating system, adjust rating criteria as needed, and eventually ensure that future selection will identify only the most important activities that the two governments should pursue. It should be noted, however, that all possible recommendations will be submitted with the final report, as those recommendations currently ranked lower may become major efforts in future years under different conditions and economics.

The CEMWG acknowledges that community support is critical to implementation of the final recommendations by the City and County, which drives the CEMWG's commitment to stakeholder involvement throughout the process. Therefore, the co-chairs are reaching out to key members of the two governments, several elements of the county's and city's vibrant business communities, faith leaders, civic organizations and advocacy groups to enlist them in distributing simple surveys on their members' opinions of climate impacts and possible remedies, and to develop strategies for member input into final recommendations. In addition, subgroups have identified more than 80 individuals, organizations, or community sectors for dialog to understand their perceptions of the new climate to solicit feedback about mitigation and adaptation solutions. Their networks, in turn, will provide an anticipated 10 fold increase in outreach. Stakeholder feedback will be used to craft recommendations to optimize public support for future City and County decisions.

Reports from Subgroups

Agriculture, Forestry and Land Management

Soon after the CEMWG began to convene in the fall of 2020, the AFL Subgroup elected to split into four interrelated but separate study groups, which include Agriculture, Food Recovery and Composting, Forestry, and Land Management. The AFL Subgroup continues to meet briefly to

exchange information, research and determine areas of potential overlap and collaboration. Brief reports from each of these groups follow. Karen Cannon and Barb Trader co-chair this Subgroup.

Agriculture

Team Members - Greg Wilson, Chair; Taylor Roman, Matt Morris, Richard Jefferies, Barb Trader.

Key Findings

- Maryland (including Frederick County) is one of the top states in the nation applying conservation agriculture practices for water quality. Many water quality conservation practices are also used to improve and support healthy soils.
- Nitrous oxide, albeit not insignificant, is estimated to be roughly 1.5% of the County's GHG emissions. Therefore, reducing nitrogen fertilizers on agricultural lands may not be pursued further as a potential source for GHG reductions.
- Frederick County's 215,622 acres of managed land consists of soil which may not be reaching its potential to sequester greenhouse gases, sustain natural fertility, and support healthy water and nutrient cycling. Therefore, improving soil health is a priority.
- According to the Metropolitan Washington Council of Governments (COG), agriculture is responsible for roughly 6% of the County's current GHG's. There may be ways to increase the carbon sink capacities within Agricultural production systems.
- For every one percent increase in Soil Organic Matter, an additional 20,000 gallons of stormwater per acre can infiltrate, providing a storage reservoir for crops during drought, cooling local climates, and supporting an active soil biotic community to recycle needed nutrients.
- Adoption of broad-scale regenerative land management, otherwise referred to as healthy soils practices[3], offers a significant and proven pathway to repair water cycling, decrease stormwater loads, decrease release of environmental toxins, increase stream water quality, increase farm profitability, and increase biodiversity above and below ground, making flood prevention and increased drought tolerance main drivers for action.
- There is evidence that increasing Soil Organic Matter also increases soil's capacity for carbon sequestration.
- Regenerative land management implementation is consistent with the *Livable Frederick* Master Plan.

Stakeholders

The agriculture work group has actively engaged diverse perspectives and expertise. People involved in our regular meetings and represent the following organizations:

- Healthy Soils Frederick
- Frederick County Farm Bureau
- Chesapeake Bay Foundation
- Fair Farms Now

[3] "Managing for soil health (improved soil function) is mostly a matter of maintaining suitable habitat for the myriad of creatures that comprise the soil food web. This can be accomplished by disturbing "Disturb the soil as little as possible, growing as many different species of plants as practical, keeping living plants in the soil as often as possible, and keeping the soil covered all the time." https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/mgnt/

- Waterkeepers Chesapeake
- Potomac Conservancy

The work group has also met with three area farmers engaged in grain production, animal production, and fruit production. They explained how their farms and farm operations consider healthy soils, climate change, and other environmental issues when implementing farm practices.

Next Steps

- The Frederick County Farm Bureau has agreed to contribute to CEMWG's efforts and initiated a team to identify/recommend farm practices to draw down GHG's and improve soil resilience for extreme weather events. The Farm Team is beginning meeting in February.
- Clarify how COG obtained and reported agricultural GHG emissions relative to other major contributors.
- Form an additional farmer-led team to identify administrative and policy guidelines, including financial concerns, to support farm practices achieving environmental goals.

Sources

The work group has obtained expert input from USDA and Maryland Soil Scientists, a NRCS conservationist, and a Catoctin Soil District representative along with numerous published papers.

Food Recovery and Composting

Team Members: Patrice Gallagher, Kerri Hesley, Karen Cannon, Aurisbel Banny, Linda Norris, Lisa Orr, Richard Jefferies.

Key Findings

- Up to 40% of food in the U.S. is wasted. Americans throw out more than 400 pounds of food per person annually. Food production practices, consumer food actions, and landfilled food waste produce significant CO2E emissions.
- CO2E can be greatly reduced and even sequestered (net negative) through consumer education and broad scale composting of all currently-landfilled organics.

Ideas

- Scale up recovery of unused food from restaurants and institutions to feed people, via the replication and/or adoption of programs such as LeanPath, Zero Percent, Copia, Re-Plate, and for restaurant chains, Food Donation Connection, or the larger-scale Feeding America's MealConnect.
- Divert all remaining food waste out of landfills and into composting programs, including backyard composting, community pick up sites and larger municipal collection for commercial scale composting. Proper composting practices turn a waste product into a resource, sequestering stable soil carbon, and building natural soil fertility, while improving water and nutrient cycling. When compost is applied to one acre of land, as part of a regenerative management plan, one ton of CO2 or more can be sequestered per year, and 20,000 gallons of additional stormwater can be retained in the soil.

- Establish a Food Hub to increase production, distribution, and consumption of local regeneratively grown food, educate consumers, and expand and diversify our farming economy.

Stakeholders
This subgroup plans to meet with and/or survey grocery stores and food distributors, Frederick County Public Schools, Hood College, farmers, Frederick Community College, Mt. St Marys, food and beverage producers, restaurants, food service companies, HOAs, food banks, caterers/event managers, and farmer's markets to generate feedback that will help target and structure recommendations.

Next Steps
- Follow up with stakeholders.
- Prioritize actions from researched programs.
- Set timelines for implementing goals.
- Validate GHG accounting.
- Research related cost/benefit analyses.

Sources
USDA, Dr. Richard Teague, Project Drawdown, Rodale Institute, Dr. Elaine Ingham, Livable Frederick Plan.

Forestry

Team members: Paul Walker, Tom Anderson, Erin Goodnough

Key Findings
- Forests are the best natural climate solution.
- The current county canopy is 180,000 acres. This canopy is responsible for 3 Metric Tons (MT) of carbon dioxide equivalents (CO2E) sequestered per acre annually which equals 540,000 MT of GHG sequestered currently.
- 2018 County CO2E emissions (per COG) = 3,610,000 MT. This means the current canopy offsets 15% of current (2018 - most recent year available) emissions annually.
- Employing best management practices (BMPs) and increasing canopy by 10% (18,000 acres) while maintaining current canopy will increase carbon benefit to an estimated 20%.

Ideas
- Reforest, afforest (establishing a forest on land not previously forested), and preserve land for natural regeneration (known as "re-wilding").
- Plant urban, ex-urban, riparian areas. Use GIS information to target locations.
- In partnership with DNR, use best forest management practices to optimize stocking and ability to capture CO2E.
- Support a strong local market for wood products, explore use of local biomass for energy, and track development of carbon markets.

Stakeholders
The Forestry Workgroup held meetings with the following: City Sustainability Manager on TreeFrederick as a model for urban forestry; MD DNR Forest Service Asst. Director, W. Regional Forester, and Bay Watershed Forester to review mission and request support; MD DNR Frederick County Forester; MD DNR GIS expert for target tree planting map layers; County LFP Design Planner, GIS Analyst, GIS lead to discuss map layer availability, request support and feedback on targeting approach; and County Forest Conservancy Board, which includes tree farmers and loggers, to review ideas and solicit input.

Next Steps
- Evolve ideas to recommendations and action plans.
- Follow up with stakeholders from DNR Forest service to validate carbon accounting and target planting locations.
- Elicit support from outside forestry experts.
- Follow up on input from the Forestry Board.

Sources
DNR MD Forest Service; COG (2020). Metropolitan Washington Analysis for 2005, 2012, 2015 and 2018; *Livable Frederick* Plan; Tree-mendous MD; TreeFrederick; City/County Sustainability Offices; Forest Conservation Board; Drawdown.org; EPA; American Forests; USDA.

Land Management - Public and Private (Non-Ag) Land

Team Members
Taylor Roman, Lisa Orr, Ann Payne, Karen Buchsbaum

This smaller workgroup's area of focus includes the management of all public and private lands not already under the purview of the agriculture and forestry sub-groups, including land managed by state, county, and municipal governments, commercial property owners, private institutions, public schools, private homeowners, HOAs, and construction companies.

Key Findings
- The mean potential carbon sequestration for home landscapes would be 16 times greater if managed using regenerative (healthy soils) practices. The carbon sequestration and water infiltration benefits of implementing soil health practices on public and private lands are similar to those listed in the agriculture section above.
- The County's ability to meet its water improvement plan responsibilities under the Clean Water Act would be greatly benefited by adoption of healthy soils practices by public and private land managers.
- There is a positive correlation between plant diversity and carbon sequestration capacity.
- Sites planted with native species to increase diversity have been shown to sequester carbon at rates 2-3 times that at unmanaged sites.
- Lawn conversion programs (from lawn to native perennial meadow or forest, etc.) in other jurisdictions are very popular and oversubscribed when offered.

Ideas

- Manage County and municipal parks, recreation areas, and public lands (riparian areas, grasslands, floodplains, and wetlands) for climate change mitigation and adaptation by developing programs and adopting regenerative practices that improve soil health, reduce soil erosion, increase drought resistance, sequester carbon, and mitigate greenhouse gas emissions.
- Participate in regional resilience coalitions to consider land management practices on a broader scale.
- Explore opportunities to support and incentivize commercial and institutional property owners to develop native regenerative landscapes that improve soils, sequester more carbon, mitigate stormwater, and support biodiversity.
- Encourage landscape companies to develop expertise in integrative landscape management and regenerative practices for healthy soils and carbon sequestration.
- Encourage/incentivise homeowners to replace turf lawns with native plants and regenerative landscaping capable of sequestering more carbon.
- Explore ways to reduce the use of pesticides/herbicides as it disrupts healthy soil biology and its water infiltration and carbon sink potential.

Stakeholders

Conversations are underway with:

- Frederick City and County Parks and Recreation Departments
- Frederick City Sustainability Manager and Committee
- Master Gardeners and Master Naturalists

Next Steps

- Continue to talk with stakeholders to refine ideas into recommendations.
- Assign specific group members to focus on research and development of actions.

Sources

- *Livable Frederick* Plan
- Frederick County Sustainable Action Plan
- Selhorst, Adam, and Rattan Lal. "Net Carbon Sequestration Potential and Emissions in Home Lawn Turfgrasses of the United States." *Environmental Management*, vol. 51, no. 1, 2012, pp. 198–208., doi:10.1007/s00267-012-9967-6.
- Yang, Yi, et al. "Soil Carbon Sequestration Accelerated by Restoration of Grassland Biodiversity." *Nature Communications*, vol. 10, no. 1, 2019, doi:10.1038/s41467-019-08636-w.
- S. Chen et al. "Plant Diversity Enhances Productivity and Soil Carbon Storage." Proceedings of the National Academy of Sciences USA April 17, 2018 115 (16) 4027-4032

Energy, Transportation and Buildings

Team Members: The ETB subgroup is benefited by members with expertise across buildings, finance, codes and regulation, renewable energy, affordable housing, electric vehicles, renewable

fuels, transportation, affordable housing and energy efficiency. This subgroup is chaired by Ron Kaltenbaugh and members include James Baker, Aurisbel Banny, David Berliner, Milton Dahl, Joanne Ivancic, Christopher Izzo, Joel Rensberger, Robert Robey, Jerry Rusnock, William Steiglemann, Chris Voell, and Bruce Zavos.

Key Findings and Ideas
It has become clear that finance, efficiency, and codes and/or standards are common threads across our exploration of energy, transportation, and buildings with several options pertinent to all three, such as adoption of more residential EV charging. Additional common trends are improvement in cost performance and an observed increase in opportunities for finance to address issues of higher upfront costs. In many cases, improved lifecycle results, combined with creative financing, can allow for deployment of solutions that have lifecycle savings and are cash flow-positive from the start.

Energy is an important component of any effort to address climate change. While much of the country's energy infrastructure exists outside Frederick County, options for impacting and influencing energy at the city and county level include:

- Find ways to generate more distributed energy, such as solar on homes and buildings. Electrification is a primary strategy in both Buildings and Transportation sectors and an important part of a future energy strategy is reducing the greenhouse gas emissions associated with generating electricity for the power grid.
- Develop strategies to address peak energy needs. This effort is key to reducing use of "peaker plants" (energy plants tapped into at high-demand times, such as dinner time and the hot weather months) which tend to be higher polluting facilities. Solar on schools with large, mostly empty roofs, have low energy use during the summer and can thereby provide energy to the grid at times of peak demand while generating savings for the school system.
- Improve energy efficiency and energy conservation, which are important aspects in reducing energy demand, yielding the most carbon-free and least polluting unit of energy, a negawatt.
- Consider the use of microgrids to enhance resiliency, especially for critical infrastructure such as hospitals.
- Identify ways for the city and county to rapidly deploy renewable energy across Frederick County. Renewables accounted for approximately 11% of the state's total electricity generation in 2019, indicating that much more needs to be done to reach Maryland's 50% 2030 goal.

The transportation sector is currently the highest contributing sector to greenhouse gases and climate change and has great potential for innovation and improvements that include multiple co-benefits. Areas we are exploring include:

- An electrified bus rapid transit (BRT) system would result in maximum GHG reduction and link key county locations to other mass transit options in the region, including METRO. This would have extensive co-benefits, such as reduced traffic congestion, improved air quality, and address transportation equity concerns for people with disabilities and other transportation-dependent people, such as those who do not own cars.
- Increasing the number of bus stop shelters to protect riders from heat and precipitation.
- Increasing walkable and bike-friendly neighborhoods to reduce vehicle miles traveled and improve health.
- Reducing flood risks to transportation infrastructure through more long-range planning.
- Providing incentives for increased telework and improved broadband access.
- Developing the infrastructure needed to support electrification of transportation including more EV charging, upgrading fleets to electric vehicles, and an EV-Ready Building Program, such as pre-wiring for EV charging.
- Reducing existing fleet fuel use through use of renewable fuels and more renewable fuel choices at retail gas stations.
- Combining electric school buses with Vehicle-to-Grid (V2G) technology creating a virtual power plant, especially useful during summer.

Buildings are “capital stock” that generally last for decades - or centuries - and opportunities for upgrades and replacement are much less frequent than that which occurs with energy and transportation infrastructure. Likewise, most waking life takes place inside buildings which can have both positive and negative impacts on human health. With these characteristics in mind, ETB is exploring these ideas:

- Adoption of newer building codes, such as the International Energy Efficiency code, ASHRAE 90.1, and building performance standards.
- Establishing procurement guidelines for government projects.
- Measures to track and quantify building energy performance.
- Ways to improve existing building and housing stock through polices that accelerate the rate of energy upgrades at intervention points such as point of lease, point of sale, major renovations, systems replacements, and zoning or use changes.
- Addressing incentives (for example - tax credits, rebates) for energy efficient purchases and improvements.
- Options to incentivize building retrofits and net-zero energy buildings.
- Energy Efficient Mortgages (EEM) for purchase of energy efficient homes.
- New financing options such as a Green Bank and more education/promotion of PACE financing.

Next Steps
ETB will spend the next six months developing general ideas into specific recommendations. This will entail exploring pathways to ease and speed implementation of recommendations, highlighting and documenting co-benefits from efficiency, a cleaner energy system, and lower costs (including connecting with other subgroups to show the health benefits, health-system cost savings, improvements in equity, and business opportunities available), and documenting declining cost curves and improvements in financing options. Some of these ideas will require new expenditures, but there are many areas where climate friendly solutions are also cost saving solutions.

Sources
The *Livable Frederick* Plan has been an important resource. ETB is also drawing upon other climate plans from across the country and is leveraging expertise in Passive House design and resources from the Institute for Market Transformation, among other groups.

Health, Extreme Weather and Adaptation

Team members
Co-chairs John Scherer and Kevin Sellner; Members Ross Bradley, Darlene Bucciero, Vanessa Gress, Weondong Hwang, Faith Klareich, Joanna LaFollette, Shifali Mathews, Karen Russell, Audrey Ting.

Key Findings
HWR members have focused on identifying four Aspects/Impacts areas:

- extreme heat
- extreme storms
- drought, and
- elevated CO_2.

To be most responsive to public interest, HWR is focused on the tangible, obvious experiences routinely faced that are associated with these aspects of our new climate, including flooding events, poor air quality, heat stress, weather extremes, and environmental damage. Outcomes of these aspects include threats to public health, fiscal losses to residents and businesses for repairs, damages, or closures, and environmental degradation. We have identified approximately 20 critical impact topics in these categories and members are now selecting specific impacts to explore, delving into what other jurisdictions have done to ameliorate or adapt to better address the threats in the future. We are finding that multiple adaptations for implementation have been initiated elsewhere, providing models to consider.

- Adaptation to changes in climate overlap with GHG reduction in several areas. These are topics which span both GHG reduction and climate adaptation and which HWR members are collaborating with other subgroups: forest and agriculture soil organic matter (SOM) are CO2 sinks, as well as adaptations that increase water percolation and retention

capacity, thereby reducing runoff of nutrients, sediments, and pathogens critical to our environment's water quality, drinking water treatment needs, and public health. The SOM also provides a buffer to the expected longer drought periods that may afflict crop production in our agriculture-dominated county, an internal water supply to protect farm productivity.

- Forest tracts are also wildlife corridors that maintain the native animal population habitats and biodiversity important to ecosystem services of this region and mental health of local residents.
- Building energy considerations and retrofits can reduce GHG emissions while minimizing heat impacts on homeowners and renters as well as protecting property from extreme weather damages.

Because extreme weather impacts crop and animal production in this region and more so in regions where our food is typically sourced, local food security is an HWR focus area. This concern will be addressed in part by decreasing food waste and increasing local food production, which also positively impacts GHG reduction and is described more completely in AFL's section above.

All HWR focus areas above impact the health of all segments of our community. CEMWG is fortunate to have the help and guidance of Dr. Amir Sapkota from the University of Maryland as a scientific advisor, focused on critical public health capacities that may be needed to minimize climate change impacts on local residents.

Many communities around the country are grappling with the reality that climate impacts disproportionately threaten and harm lower income and other vulnerable segments of the population.. Locally, these populations include those living in extreme poverty, the ALICE (Asset Limited, Income Constrained, Employed) community, individuals with disabilities and chronic illness, and seniors. CEMWG is committed to minimizing and alleviating unfair burden on community members and final recommendations will reflect those concerns. Hence multiple implementation plans will be embodied within future recommendations to minimize climate impacts on those community members. As an initial step, HWRis reaching out to COG staff to identify fine-scale street boundaries for previously identified Equity Areas of the City and County to enable potential siting of assistance facilities and utilities in final report recommendations.

Stakeholders

HWR members are selecting stakeholder groups to engage to seek opinions for how the new climate is affecting their organizations or activities. The engagement, individually or in collaboration with members of other sub-groups, will foster an understanding of key areas of concern for each stakeholder that will subsequently indicate options for most responsive recommendations to these impacted members of our community. HWR and AFL are surveying a Farm Bureau AG Team on farmer approaches to address future environmental goals as well as the county and city parks and recreation departments to understand likely areas for supporting or revising management practices for the new climate, a focus that may extend to management practices for all lands, public and private. HWR is also seeking recent Frederick hospitalization

data from the state specific to the new climate impacts on respiratory distress, heat stress, infections, and cardio, renal, and diabetic clients.

Next Steps
HWR members are expanding initial explorations of sub-group identified impacts, assessing efficacy of recently developed Prioritization Criteria for the sub-group's primary impact topics, continuing review of identified resources for adaptation approaches used elsewhere, and selecting and then identifying lead individuals in specific stakeholder organizations and groups for future engagement with members of other CEMWG sub-groups.

Sources
COG staff, data, and Climate Action Plan; WI, Montgomery County, Broward County, Hoboken Action Plans; *Livable Frederick*; County S. Moore and City J. Willoughby; EPA, USDA, CA websites; Dr. S. Via (UMD) climate-Ag webinars; MD Public Health and Climate report; MDE/Maryland Commission on Climate Change/Adaptation and Resiliency Workgroup; JHU Center for a Livable Future Food Policy Networks: http://www.foodpolicynetworks.org/about/; several peer-reviewed publications from the primary literature.

Public Awareness and Outreach

Team
This team is co-chaired by Sonia Demiray and Kate Wilson, and members include Katey Grogan, Shane Stewart, Virginia Borda, Janet Ady, Michelle Schaefer and Kristen Schultz. Students from the University of Maryland also volunteer.

Public Engagement and Outreach Efforts
- Began using "Mobilize Frederick" as a tagline and started working on identity items such as a logo, a photo library, and 'fast facts' to inform the public.
- Created a website: www.MobilizeFrederick.org, the Workgroup's "business card", and an open forum where people can ask questions, submit, and exchange ideas; we also offer a toolbox, our news archives, and surveys.
- Created social media handles on Twitter, Instagram, and Facebook with an average of three posts a week.
- Earned coverage on local, radio, and print (https://www.mobilizefrederick.org/blog.) The *Frederick News Post* has offered space for a 500 word article each month in the Green Section (when space is available).

Targeted Stakeholder Outreach
- Defined as those impacted "first and worst" by climate change impacts, Frontline Community Outreach has been a priority.
    - Surveyed organizations and leaders that primarily serve this population to understand how the likely effects of climate change are affecting and will continue to affect this community. Community sectors served by the organizations and identified include those requiring assistance in housing, human

services or mental health, veterans, immigrants, people of color, and individuals with disabilities or special needs.
    - Sent the surveys to 81 individuals from 39 groups in English, and 8 people from 6 groups in Spanish. With some help from the Frederick Sunrise Movement and H.E.A.T. (Hood Environmental Action Team), called survey recipients multiple times to encourage a response. Twenty-one responses were received from 17 organizations.

- Business outreach:
    - PAO and CEMWG co-chairs are designing a strategy to survey area businesses to discover any actions on climate mitigation and/or adaptation already implemented and/or considered, identify what they are observing in terms of impacts, and what they may be interested in learning. Survey results will be shared with all CEMWG members and follow-up engagement will be designed based on results.
    - Businesses that are already implementing mitigation and adaptation measures are now being highlighted through CEMWG's social media posts.

- Education outreach is a priority because all students, from pre-K to post-grad, will feel the brunt of climate change and live with the consequences. An educated community will be more resilient and better prepared to adapt to the impact of climate change.
    - PAO compiled a list of about 50 teachers, students, after-school program leaders, and curriculum experts who have a history of involvement with environmental issues and education, and has been conducting in-depth telephone interviews with them. The goal is to identify opportunities for environmental education in both formal and non-formal settings across all age groups.

- Household outreach is focused on Neighborhood Advisory Committees (NACs) and HOAs. The County's Green Homes Challenge is a proven educational and engagement program which has great potential for updating and expansion.

Next Steps

- Research strategies other jurisdictions have used to successfully involve residents and businesses in climate action plans.
- Create a full report of survey findings and provide to all subgroups for consideration while developing recommendations; open additional avenues for more feedback from these communities as recommendations are being drafted.

Next Steps

The next six months will be focused on producing thoughtful recommendations, making full use of the research currently available, stakeholder feedback and the expertise of workgroup members. Stakeholder conversations will help to identify community priorities. It is clear that a volunteer-led twelve-month process will be only the beginning of the extensive stakeholder involvement needed for the City and the County to gain the most from the anticipated recommendations.

Appendix A - Expert Presentations

CEMWG Meetings:

I. 8/27/20, Workgroup Kickoff, Climate Change: Interconnectedness and Co-Benefits, Ron Kaltenbaugh, ETB
II. 9-24-20: Status of Frederick City's Climate Change Efforts and Planning; Jenny Willoughby, Frederick Sustainability Manager
III. 10-8-20: Livable Frederick Plan and Frederick City's Comprehensive Plan; Kimberly Brandt, Office of Planning and Design; Brandon Mark, Frederick City Planning Department
IV. 10-22-20: Frederick County's Climate Action Plan and Progress; Shannon Moore, Office of Sustainability and Environmental Services Manager; Jeffery King, Metropolitan Washington Council of Governments Principle Environmental Planner
V. 11-12-20: Supporting People Through Change: Liz Vandolah, University of Maryland and Greg Wilson, AFL
VI. 11-23-20: What Gets Financed Gets Built, David Berliner, ETB
VII. 11-12-20: Understanding Frederick's Most Impacted Populations - ALICE: Martin Fugold, United Way of Frederick County and James Baker, ETB
VIII. 2/11/21, Understanding Sustainability: A Passive House Approach, Bruce Zavos, ETB

ETB Meetings:

- 10/7/2, ETB Meeting, Shane Pollin, High Performance Green Buildings
- 11/2/20, ETB Meeting, Sean Armstrong, Electrifying Older Homes
- 11/9/20, ETB Meeting, Jill Hamilton, Biofuels and Ethanol
- 12/9/20, Sunrise/Heat Meeting, Ron Kaltenbaugh *, Climate Economics and Finance
- 12/14/20, ETB Meeting, Ahmed Abdellah, Project Green Fleet
- 1/16/21, CCWG Meeting, Ron Kaltenbaugh *, Climate Economics and Finance
- 2/16/21, Thurmont Ministerium, Ron Kaltenbaugh *, Climate Actions and Economics

Appendix B - Media

The work of the CEMWG has been featured in local media 14 times since its inception. Newspaper articles, radio and TV features are located here: https://www.mobilizefrederick.org/blog. The most recent article appears below.

FEELING HOT

The local impacts of extreme heat caused by climate change

By KEVIN SELLNER and BARB TRADER

Special to the Frederick News-Post (2-12-21)

Three recent articles identified how the accumulation of several gases (greenhouse gases) in the earth's atmosphere has led to the new climate we are now experiencing in Frederick. Most recently, the difference between climate (long-term averages) and weather (variability about the average conditions) was explained. Local residents are already feeling the impact of these changes in our atmosphere, providing compelling evidence that climate change is not just someone else's problem — it is also ours, made clear by the local changes that are increasingly evident in our daily lives.

The most obvious change is the extreme heat we now experience in the summer. Neighboring Washington, D.C., recorded the third hottest July on record last year, with 28 of 31 days at greater than 90 degrees. It was also the third warmest year on record. Increasingly intense heat is also expected to impact residents locally.

As the state's and University of Maryland's public health and climate report states, extreme heat threatens large portions of our community, through heat stress and poor air quality. And for residents with cardiovascular or kidney problems or diabetes, it could cause severe health effects and hospitalizations. For outside workers such as roofers, painters, contractors and landscapers, more intensely hot summer days increases the likelihood for heat stress, dehydration and dizziness.

Homeowners are also experiencing increased costs of utilities for home cooling. From late June to early September, daytime home or business cooling is now nearly nonstop. Community members already strapped for cash to meet regular household expenses are now in need of assistance for utility payments.

Extreme heat also threatens agriculture, Frederick County's leading industry. Research shows that increased heat reduces plant growth and productivity, including lower pollination in sweet corn and tomatoes, reduced pod production in soybeans, and loss of pepper flowers and fruits. Dairy cow fertility and milk production are lower during heat waves, while poultry fertility and egg production is depressed, and birds are more susceptible to disease.

In the natural environment, local native brook trout populations are increasingly threatened as stream temperatures now routinely exceed their highest thermal limits at roughly 77 degrees.

Temperatures are also warmer throughout the year, including winter months. Last winter's coldest temperature was 22 degrees, the warmest winter minimum of the past 71 years. This means we now have increased pest risks. Freezing winter conditions have historically helped to control pests such as ticks, insects and weeds, offering natural regulation of these threats to crops and human health, as well as the spread of wildlife diseases they transmit.

Just as important as intense summer heat, the warmer temperatures throughout the year have extended the growing season for many plants, a bonus for some harvestable plants but a concern for spring crop failures if a late freeze or extreme spring storm occurs, as in May of 2018. These warmer conditions also lead to asthma or allergies for residents exposed to extended seasonal pollen release due to the longer growing season.

We now experience all of these warmer temperature-driven patterns and impacts in Frederick, well beyond historical conditions. Unfortunately, the impacts will only increase with the warmer temperatures expected, derived from those gases released into the atmosphere that envelope our planet. This is why actions we take as a community to reduce the release of greenhouse gases and develop strategies to adapt and build resiliency are so important.

For more details, visit Mobilize-Frederick.com.

Research shows that increased heat caused by climate change threatens agriculture by reducing plant growth and productivity.

Courtesy photo

Research shows that climate change is everyone's problem, made clear by the local changes that are increasingly evident in our daily lives. The most obvious change is the extreme heat we now experience in the summer.