



Andy Schor, Mayor

CITY OF LANSING

SUSTAINABILITY ACTION PLAN

2022



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LETTER FROM THE MAYOR

Andy Schor
Mayor



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OFFICE OF THE MAYOR CITY OF LANSING, MICHIGAN

Taking bold action on climate change is critical, and protecting our land, water and other natural resources is necessary if we are to protect our community from the devastating effects of climate change.

Over the last two years, we've been able to elevate climate action planning in Lansing. We commissioned our first municipal climate action plan, which prioritizes energy efficiency upgrades, waste diversion and other initiatives to reduce greenhouse gas emissions and create a more sustainable City government. We now have full-time, dedicated staff working to ensure sustainability planning is at the forefront of what we do. Additionally, the Mayor's Advisory Commission on Sustainability was created. This group will help guide the City in creating awareness of these issues, as well as recommending and developing ongoing sustainability plan performance measures and best practices.

This plan represents the work of City staff, the environmental community, concerned citizens and others who have begun the process of identifying priorities and establishing goals that will become the foundation of which this work will be built upon. It sets in motion a process that will include a robust community engagement plan, where we envision all citizens, businesses, educational institutions, churches, the faith-based community and other organizations will be part of the discussion and the solution. Execution of this plan will take the work of multiple partners and stakeholders. It is our hope that the community will come together and work towards the implementation of the many goals set forth so that we can all benefit from an equitable, sustainable, carbon neutral and resilient city.

Sincerely,

A handwritten signature in dark ink, appearing to read "A. Schor", is written over a light blue horizontal line.

Andy Schor
Mayor

A photograph of a sunlit forest path. The path is covered in tall, golden-brown grass and is flanked by lush green trees. Sunlight filters through the canopy, creating a warm, dappled light effect on the ground and foliage. The scene is peaceful and natural.

INTRODUCTION

It is through indisputable evidence that the global climate is warming. Human actions are damaging local communities through harmful long-term changes negatively affecting human health, economic prosperity and environmental degradation. Political, social, economic and environmental interests must work symbiotically as people set ambitious goals to protect those on Earth now and for future generations.

The City of Lansing has taken critical first steps towards reaching its climate action and sustainability goals. In addition to hiring staff and implementing a municipal climate action plan, the City of Lansing's first community-wide greenhouse gas emissions inventory was completed 2022, which provides baseline data that can be used to plan, forecast and help set emissions reduction goals and science-based targets towards decarbonization. The City of Lansing is committed to conducting regular greenhouse gas inventories in the future. These ongoing measurements of emissions generated by the Lansing community will allow for the collection of important data that can be used to track progress towards emissions reductions by sector. There is an immense amount of work to do to reduce the City's environmental impact. This plan will serve as a guide as the City works to achieve the ambitious goals that must be accomplished to build a more vibrant and resilient community.

EXECUTIVE SUMMARY

Sustainability requires a balance of environmental health, social equity and economic development to meet the needs of the present without compromising the ability of future generations to meet their own needs or exceeding planetary boundaries. In the midst of a climate crisis, the City of Lansing's Sustainability Action Plan (SAP) attempts to accelerate Lansing's plans to mitigate the effects of climate change and adopt practices that will create a more sustainable environment and better quality of life for all citizens. The City of Lansing is prioritizing these urgent issues, as reflected in the first municipal climate action plan, adopted in February 2020. The municipal climate action plan focuses on carbon reduction and increasing efficiency in City facilities, the mitigation of solid waste, reducing water waste, increasing employee engagement and the incorporation of these principles and practices into all City operations. In the municipal climate action plan, the City of Lansing committed to reducing our carbon footprint and emissions and helping the community move towards carbon neutrality in a fiscally responsible way that also supports the City's vision and mission. This has helped set the tone for a community-wide commitment towards carbon neutrality.

Through cooperation and a community-led transition, people will reinvent their ways of life to live happier, healthier and more harmoniously within their natural surroundings. This document outlines a path the City of Lansing can take to lead in a community-driven fight against the climate crisis.

The Sustainability Action Plan takes into consideration the previous work seen within the 2012 Design Lansing Comprehensive Plan, along with the Municipal Climate Action Plan, and uses data and measurable goals to guide Lansing toward a more sustainable future. The goals, as well as the values and intent of those plans can be found throughout this document. This is meant to extend the sustainability efforts within government operations into the Lansing community, and ultimately, beyond into the tri-county region.

THE FOLLOWING AREAS OF FOCUS WERE CHOSEN FOR THEIR POTENTIAL TO HAVE THE GREATEST IMPACT:



ENERGY EFFICIENCY



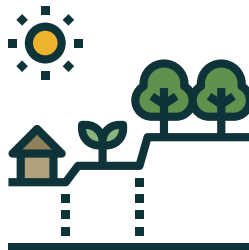
RENEWABLE ENERGY



**TRANSPORTATION
AND MOBILITY**



**CONSERVATION AND
PROTECTION OF WATER
RESOURCES**



LAND USE



**MATERIALS
MANAGEMENT**

ENVIRONMENTAL JUSTICE AND EQUITY

Environmental justice is the equitable treatment and meaningful involvement of all people regardless of race, color, gender, national origin, ability, or income and is critical to the development and application of laws, regulations, and policies that affect the environment, as well as the places people live, work, play, worship, and learn (as defined by the State of Michigan, Department of Environment Great Lakes and Energy's Office of the Environmental Justice Public Advocate).



Like many communities, there are challenges associated with environmental justice and equity in Lansing, and it is a priority to actively work to resolve them. Identifying barriers, partnering with others and finding innovative ways to overcome these challenges will be critical to ensuring equity. Prioritizing those who have historically been underserved and including all Lansing residents, businesses, organizations and others will be essential to this plan's success.

FUNDING

This ambitious plan must be implemented if Lansing is going to meet its carbon neutrality goals and science-based targets. To be a truly sustainable community and one that can withstand the impacts of climate change, a workable funding strategy to implement this plan must be developed.

The City of Lansing recognizes that funding this plan will be challenging, must encompass reasonable and affordable methods and take advantage of every available resource including federal funds, grants, incentives, rebates and creative partnerships. In addition to this, there are no-cost or low-cost financing options that can be leveraged to implement the sustainable practices outlined in this plan. Utilizing savings created through energy management and benchmarking, energy efficiency upgrades and renewable energy projects can be allocated to a revolving fund that can support additional efforts. There is a recognition that there are many needs that must be fulfilled in the City of Lansing, but simply put, action must be taken now to prevent more costly investment in the future.

SCIENCE-BASED GOALS AND TARGETS

Science-Based Targets are climate goals in line with the latest climate science. They represent a community's fair share of the ambition necessary to meet the Paris Agreement commitment to keep warming below 1.5°C. The Intergovernmental Panel on Climate Change (IPCC) states that global emissions must be reduced by 50% by 2030 from 2010 levels and achieve carbon neutrality by 2050. Equitably reducing global emissions by 50% requires that high-emitting, wealthy nations reduce their emissions by more than 50%. For most cities, this is around a 58-62% reduction, adjusted to account for the United States' contribution to global emissions and adjusted for each city's projected population growth.

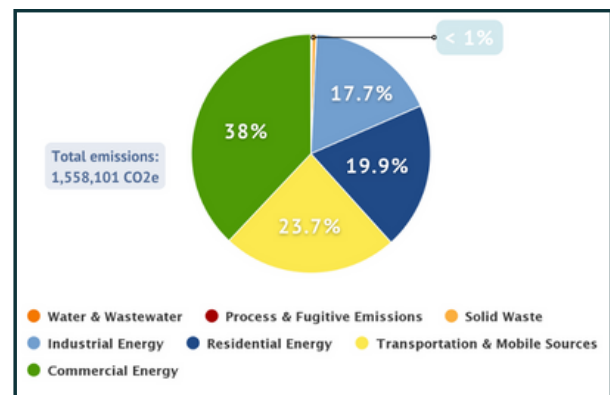
Lansing's Interim Emissions Reduction Target	59% Reduction by 2030
Lansing's 2050 Goal	100% Carbon Neutral by 2050

To achieve these goals, ambitious action must be pursued through extensive grid decarbonization, electric vehicle adoption, building electrification, and more. Specific actions and their impacts are highlighted in the attached report, "2022 Community and Government Operations GHG Reduction Strategy Analysis."

GREENHOUSE GAS EMISSIONS INVENTORY CY 2019

The following pie chart displays the greenhouse gas emissions by sector in Lansing for the calendar year 2019. The total emissions for the defined time period were calculated to be 1,558,101 CO₂e.

Please refer to the City of Lansing GHG Inventory Report in the appendices for details on emissions calculations.



The Lansing Board of Water & Light (“BWL”) is Lansing’s municipal utility provider of electricity, water, steam, and chilled water services. BWL’s 2020 integrated resource plan recommended a path that results in an 80% reduction in carbon emissions in 2030 , on¹ par with other major energy suppliers. This reduction puts Lansing on a leading path to reducing its carbon footprint and meeting the targets of the IPCC.

Working together is imperative, as BWL’s emission reductions are a critical part of the overall pathway toward carbon neutrality, as illustrated in the GHG Reduction Strategy Analysis, which can be found in the appendices. Together, we can create a vibrant and sustainable place to live, work, and thrive. Included here are important points of reference regarding the BWL’s own clean energy goals.

[1] Reduction from 2005 levels. The equivalent reduction from 2019 levels is 57%.
<https://www.lbwl.com/sites/default/files/documents/2020-bwl-irp-final-report.pdf>

[1] Xcel Energy – 80% by 2030 - <https://www.xcelenergy.com/staticfiles/xcel-responsive/Company/Sustainability%20Report/2020%20SR/2020-Leading-the-Clean-Energy-Transition-SR.pdf>

DTE Energy – 80% by 2040 - <https://dtecleanenergy.com/pathway-to-net-zero/>
 We Energies – 80% by 2030 - <https://www.wecenergygroup.com/csr/climate-report2021.pdf>

- 1 The BWL’s goal is 50% clean energy, which includes renewable energy and energy waste reduction, in 2030, as stated in the 2020 IRP Final Report.
- 2 The BWL’s 2020 Integrate Resource Plan (IRP), recommended a path that results in an 80% reduction in carbon emissions in 2030 .
- 3 The BWL’s goal stated in the 2020 IRP is to be carbon neutral in 2040.
- 4 The BWL’s 2020 IRP uses CO₂, not a CO₂ equivalent
- 5 The BWL uses 2005 as the base year for emissions metrics, which is used by the United Nations Framework Convention on Climate Change to measure carbon reductions.

KEY PRIORITY AREAS

ENERGY EFFICIENCY

Energy efficiency programs help to both reduce energy costs and GHG emissions, while creating a more sustainable building stock in a community. Energy efficiency is one of the most effective and economical ways to improve environmental quality and achieve sustainability goals. Energy improvement projects often pay for themselves, making them a wise investment. With an increased emphasis on energy efficiency, Lansing residential and commercial properties will save money, create structural improvements and help meet environmental goals.



CURRENT EFFORTS

The City of Lansing is under contract to have multiple buildings and other sites analyzed and upgraded for energy efficiency improvements. This work has a guaranteed pay back and energy savings attached to it. This is something that other organizations can do to increase the efficiency within their facilities. Both Consumers Energy and the Lansing Board of Water & Light offer energy efficiency related resources and upgrades to those who qualify. Community education and conservation efforts could go a long way to increasing awareness of how energy saving measures could help residents, businesses and others in the community, to save money and help counter the impacts of our energy use.



ENVIRONMENTAL JUSTICE CONSIDERATIONS

Low-income families spend larger portions of their income on energy bills because of a lack of access to on-site renewable energy and energy efficiency upgrades. In Ingham County, residents who earn less than 50% of the Federal Poverty Level on average spend 32% of their income on energy bills (Wirfs-Brock, 2016). Out of Lansing's entire housing stock, 67% of residential buildings were built before 1970, which was around the time when building energy codes started to come into effect.

These older buildings, without the necessary upgrades performed, are very energy inefficient and result in higher energy costs. 49.4% of residential properties are rentals in Lansing (TownCharts, 2020). Typically, landlords do not have financial incentive to perform energy efficiency upgrades because the tenants pay the energy bills. While there are programs and policies to consider and partnerships with utilities to explore, it will be important to include renters and other appropriate stakeholders in the discussion of making more equitable energy policies.

RECOMMENDED ACTIONS

OBJECTIVE 1.1: REDUCE ENERGY USE IN CITY FACILITIES

- Establish a municipal green building policy
- Use benchmarking practices to measure and report City facilities' energy usage over time
- Produce a comprehensive feasibility study or plan to optimize energy usage at all City of Lansing buildings, including implementing energy efficiency and renewable measures and options



- Continue working to upgrade city facilities and ensure savings and payback over time
- Research and implement best practices to reduce energy use at the Wastewater Treatment Plant
- Incorporate conservation-focused employee education programs

OBJECTIVE 1.2: REDUCE ENERGY USE CITY WIDE

- Establish a green building principal/policy/ordinance for the construction, operation, maintenance, and renovations of large buildings
- Incentivize an increase in baseline standards for energy efficiency that applies to new construction properties, rental properties, and low-income properties
- Improve rental home efficiency by exploring energy labeling and disclosure programs
- Ensure energy efficiency products and services are available in an equitable way to all Lansing residents
- Ensure completion of the LED streetlight and traffic signal conversion program
- Support BWL in their development of programs such as demand response and Distributed Energy Resources (DER) – (physical and virtual assets deployed across the grid that can be used to sustainably manage energy demands)

OBJECTIVE 1.3: ENGAGE COMMUNITY PARTNERS TO ENHANCE A PROGRAM THAT PROVIDES HOME ENERGY AUDITING AND ASSESSMENTS TO RESIDENTS

- Prioritize those who are income eligible
- Collaborate with a third party to perform energy assessments
- Partner with other agencies to reach community members effectively

OBJECTIVE 1.4: IDENTIFY FUNDING OPPORTUNITIES FOR THE TRANSITION TO MORE ENERGY EFFICIENT PUBLIC AND PRIVATE BUILDINGS

- Create a revolving fund for renewable and energy efficiency improvements that would include those savings resulting from the City implementing energy efficiency actions and technologies
- Promote the availability of various financing mechanisms for energy efficiency and renewable upgrades in homes and businesses. Examples include property assessed clean energy (PACE) financing and Michigan Saves
- Pursue grants for energy efficiency/renewable upgrades
- Collaborate with regional partners to explore additional opportunities for funding and technical assistance



OBJECTIVE 1.5: PRIORITIZE EDUCATION AND AWARENESS ABOUT ENERGY EFFICIENCY PROGRAMS AND OTHER RESOURCES

- Encourage and provide resources to homeowners to reveal energy use info to potential buyers, renters and landlords
- Provide information and resources to residents, businesses and others regarding energy efficiency programs and incentives
- Support the creation of education programs to encourage behavioral efficiency for all types of energy focused on climate change education. Partner with BWL and others to create these programs and campaigns; update and connect websites to generate awareness
- Inform the public about the health and wellness benefits of having greater energy efficiency
- Explore and encourage the partnership of the City of Lansing, BWL, and Consumers Energy when implementing clean energy programs

OBJECTIVE 1.6: MEASURE ENERGY USE SO THAT IT CAN BE EFFECTIVELY MANAGED

- Encourage benchmarking and consider incentives for those who choose to benchmark their building's energy use
- Explore free/low-cost programs for making energy efficiency upgrades throughout Lansing using information generated by benchmarking
- Set an example for the rest of the community by benchmarking the energy use in all City facilities using Energy Star Portfolio Manager (2.1)

OBJECTIVE 1.7: PRIORITIZE THE INCLUSION OF THE MOST VULNERABLE RESIDENTS TO ENSURE THAT SUBSIDIZED UPGRADES AND SERVICES ARE EQUITABLY SPREAD THROUGHOUT THE CITY

- Determine areas where high energy costs create an inequitable financial burden on residents and use that information to support changes and create savings
- Partner with utilities and others to encourage citizens to take advantage of energy-saving opportunities through educational campaigns, outreach events, and newsletters
- Address other building issues at the same time (lead, mold, electrical, structural)
- Couple tree canopy initiatives with energy efficiency initiatives to further lower residents' energy bills by using shade as a cooling mechanism



OBJECTIVE 1.8: INCREASE THE ELECTRIFICATION OF GAS POWERED APPLIANCES AND VEHICLES AND PREPARE FOR EVENTUAL FULL ELECTRIFICATION POWERED BY RENEWABLE ENERGY

- Explore ways to transition from gas-powered appliances, HVAC and other equipment to full electrification
- Promote the electrification of homes and businesses.
- Explore use of cold climate heat pumps
- Ensure contractors are trained and prepared for the transition
- Address training and work force challenges in Black, Indigenous, People of Color (BIPOC) communities, and partner with economic development, labor, and education agencies to ensure accurate representation when subsidizing electrification projects
- Invest in outreach and education designed to create awareness of alternatives to gas powered appliances, furnaces, etc.
- Pursue the transition to electric vehicles; transportation-related electrification objectives can be found in the Transportation section of this document
- Incentivize and encourage the electrification of all new construction and all major renovations

RENEWABLE ENERGY

Renewable energy is a major part of any decarbonization plan. There are a variety of renewable energy options, including wind, solar, geothermal and more. There are many different ways for Lansing to support, advance and take part in renewable energy deployment.

It is essential to collaborate with existing programs and identify partnerships to take advantage of opportunities in our community. Renewable energy is an important part of building a resilient city. In order for Lansing to withstand more extreme weather events caused by climate change and an increased risk of power outages, renewable energy installations and storage must be invested in.

CURRENT EFFORTS

Grants, partnerships and other resources are currently being sought out and utilized to assess the renewable energy potential at Lansing facilities. Additionally, work is being done to prepare the community for more solar installations, including pursuing a SolSmart designation. This program provides support for cities wanting to fast track permits, make information easy to find and provide an efficient turnaround time on requests.

There are a number of renewable energy projects in the city, and more being planned. City officials will work with BWL, Lansing School District, businesses and others to expand renewable energy opportunities in the city and in the region to ensure the protection of our resilient city.

ENVIRONMENTAL JUSTICE CONSIDERATIONS

Power plants that use fossil fuels disproportionately affect environmental justice communities because they can release emissions of sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM), carbon dioxide (CO₂), mercury (Hg) and other hazardous air pollutants (EPA, a). As we increasingly replace our energy needs with more renewable energy, we can phase out these harmful fossil fuel plants that are harming our vulnerable communities and contributing to global greenhouse gas emissions. While the transition to renewable energy has overwhelming societal, economic, and environmental benefits, there are still environmental justice issues that must be considered. Site planning is an important aspect of the renewable energy transition. Another critical consideration to be made is access to the renewable energy and its benefits.

On-site renewable energy generation such as rooftop solar panels are becoming more affordable, but still largely inaccessible to people with low income, the people who would benefit most from generating their own electricity. These disparities can be reconciled through efforts to expand renewable energy to low-income communities, exploring community solar projects, subsidizing solar panel purchases and installation, and working with utilities to encourage a faster move to a greater share of renewables in the energy mix.

RECOMMENDED ACTIONS

OBJECTIVE 2.1: RESEARCH, PARTNER AND COLLABORATE WITH COMMUNITY STAKEHOLDERS TO INSTALL SOLAR AND OTHER RENEWABLE ENERGY PROJECTS ON COMMUNITY CENTERS, SCHOOLS, BROWNFIELD SITES AND OTHER CITY FACILITIES, AS WELL AS PRIVATE SITES

- Prioritize city buildings for their renewable energy potential
- Encourage and incentivize schools, businesses, places of worship, and others to consider renewable energy projects
- Research grants and other opportunities that would fund renewable energy analysis and installation on public sites
- Work towards creating a resiliency hub where heating or cooling centers and basic services can be offered during power outages
- Increase the use of battery systems and promote their use
- Research feasible renewable energy procurement options for City buildings and other locations

OBJECTIVE 2.2: PREPARE THE LANSING COMMUNITY FOR MORE SOLAR INSTALLATIONS

- Review zoning ordinance and update it as needed to permit solar and other viable renewable options in all residential and commercial zones
- Encourage community solar projects and utility-scale renewable energy production
- Consider using National Renewable Energy Laboratory's SolarApp program and/or other tools and resources designed to process solar requests quickly and efficiently
- Pursue SolSmart designation in order to effectively organize our government operations to allow for residents and businesses to quickly and easily apply for solar permits

OBJECTIVE 2.3: PROMOTE LOCAL UTILITY PROGRAMS THAT FEATURE RENEWABLE ENERGY OPTIONS

- Support BWL's Greenwise Energy program, which allows users to source their energy from cleaner energy sources, while working to encourage the use of renewables in a more substantive way
- Continue to support and promote future renewable energy opportunities as they arise

OBJECTIVE 2.4: PROVIDE EDUCATION AND OUTREACH TO RESIDENTS ABOUT THE IMPORTANCE OF RENEWABLE ENERGY AND ITS USES AND APPLICATIONS

- Provide information and resources to commercial and residential property owners
- Utilize City newsletters, social media, website and other resources to distribute information
- Feature stories on new renewable projects in the City

OBJECTIVE 2.5: PROMOTE COMMUNITY BULK/BUY SOLAR PROGRAMS

- Research models from other communities (Great Lakes Renewable Energy Association program)
- Organize community meetings as needed to facilitate neighborhood engagement as well as connections with utilities and contractors
- Support the BWL reviewing financing and other ways to make projects more accessible, including on-bill financing



TRANSPORTATION & MOBILITY

Transportation is one of the largest contributors to Lansing's GHG emissions, making it a significant issue in the fight against climate change. Reducing vehicle miles traveled is key, therefore it is essential that our city is designed to encourage less driving, have widespread and safe opportunities for biking and walking, and ensure that green spaces, food, and other necessities are closer to homes. Perhaps the biggest impact will come from transitioning from on-road gasoline vehicles to electric vehicles. Lansing must continue to transition its own municipal fleet and support the transition for EV adoption community wide. Fortunately, there are grants, funds and other resources available to make the transition more feasible. As fossil fuel-powered vehicles are phased out, we must do everything possible to replace them with feasible EV alternatives. To make this possible, we need to build out an efficient EV charging infrastructure, working in Lansing and throughout the region to make it possible for a more complete transition for both residents and other organizations with larger fleets.



CURRENT EFFORTS

Lansing has been a leader in creating non-motorized transportation opportunities, with bike paths, the river trail and other ways for people to choose biking or walking within their community, rather than driving. The City of Lansing was the first city in Michigan to pass a Complete Streets Ordinance when the Lansing City Council approved its adoption in August of 2009. In 2011, the Public Service Department adopted the first non-motorized plan for Lansing. In 2012, a bicycle parking ordinance was passed, which requires projects going through site plan approval to provide short- and long-term bicycle parking. The City's non-motorized transportation efforts have encouraged citizens to use alternative forms of travel, thereby reducing transportation-related emissions. Lansing's Public Service Department has a demonstrated commitment to creating and improving safe sidewalks, pathways, and bike lanes for the citizens of Lansing. Public and private vehicles are beginning to transition to electric and hybrid, but much more work is needed. Collaboration with The Capital Area Transit Authority (CATA), the Tri County Regional Planning Commission (TCRPC) and other partners to transition to a healthier transportation system for the region is essential.

ENVIRONMENTAL JUSTICE CONSIDERATIONS

In Lansing, the construction of I-496 broke up a historically black neighborhood, causing the demolition of 600 homes, 60 businesses, and 15 farms (Ingells, 1965). This broke up neighborhoods, shut down black-owned businesses, and forced the relocation of hundreds of families. Within the transportation sector, historically unfair policies, poor air quality and the public health implications that come with it such as respiratory diseases, and noise pollution often impact traditionally underserved members of the city, including low-income citizens, the elderly, and the BIPOC community. There is also an identified disparity in walkability from neighborhoods to essential services, such as affordable and healthy grocery stores, parks, restaurants, and places of employment.

Our next steps in improving our transportation system in the city must make steps to correct some of these injustices. In the future, our transportation-related initiatives will consider the preservation of neighborhoods, reduce noise pollution, reduce vehicle accidents, increase air quality near major roads, and ensure safe walkability to neighborhood centers, businesses, and green spaces.

RECOMMENDED ACTIONS

OBJECTIVE 3.1: ELECTRIFY PUBLIC VEHICLES

- Complete a comprehensive fleet optimization study of City vehicles to determine and pursue the most effective path towards the purchasing and maintenance of electric and hybrid vehicles
- Engage with the Capital Area Transit Authority, Tri-County Planning, Michigan State University, and neighboring communities to encourage the electrification of the regional bus fleet
- Research and pursue grants and other funding resources to help with the transition
- Pair future fleet electrification with the installation of local renewable energy to ensure that EVs are carbon-free



OBJECTIVE 3.2: EXPAND EV INFRASTRUCTURE CITY-WIDE

- Develop a city-wide or regional strategy for EV infrastructure by identifying high priority sites for charging stations
- Partner with BWL, commercial districts, businesses & more to establish EV charging in workplaces, parking lots, and high-density residences
- Maintain an ongoing list of existing and future EV infrastructure sites to map and communicate EV charging locations
- Pursue federal infrastructure funds and other resources related to EV adoption
- Pursue an EV readiness ordinance to ensure that any new construction for parking incorporates the electrical capacity and circuits to support EV charging stations

OBJECTIVE 3.3: ENCOURAGE MORE BUS TRAVEL

- Collaborate to support and expand CATA's smart shelter initiatives by renovating bus shelters to be accessible, safe, and useful; this includes seating, lighting, charging stations, Wi-Fi, real-time bus tracking displays, and design features to protect riders from weather
- Continue to partner with local artists and community organizations to beautify bus shelters in a way that reflects the vibrancy of Lansing's neighborhoods
- Partner with the Lansing Board of Water and Light to power shelters using renewable energy
- Encourage the continued use of transportation accessibility options for Lansing School District students such as the partnership between CATA and the Lansing School District that provides bus passes to students
- Partner with CATA, the Tri-County Regional Planning Commission, Michigan State University, and neighboring communities to support the implementation of wireless internet access on CATA buses; this will attract ridership and will help to close the digital divide by enabling Lansing residents to use their commute time productively

OBJECTIVE 3.4: ENACT A CITYWIDE ANTI-IDLING ORDINANCE

- Identify high-risk enforcement zones based on public health protections of vulnerable populations, parks, and high-density pedestrian areas
- Invest in signage and public messaging to communicate these new guidelines
- Couple anti-idling measures with urban tree canopy development to provide shade and reduce the need for drivers to idle during the summer months

OBJECTIVE 3.5: ESTABLISH A MODEL FOR ENVIRONMENTALLY FRIENDLY WORKPLACE COMMUTING PRACTICES

- Encourage City employees to refrain from single occupancy vehicle usage by carpooling or using public transit
- Set up a community rideshare program for City of Lansing employees and other workers
- Aid private businesses in setting up similar models to improve employee commuting practices
- Encourage alternate work arrangements, such as remote, hybrid and alternate schedules that could reduce traffic during peak commute times

OBJECTIVE 3.6: EXPLORE THE POSSIBILITY OF FAST, RELIABLE, AND HIGHER VOLUME TRANSIT ALONG LANSING'S MOST HEAVILY TRAFFICKED CORRIDORS

- If funding can be secured, explore options for enhanced transit with partners such as CATA and other agencies
- Identify and investigate the feasibility of implementing projects along corridors with high ridership and congestion

OBJECTIVE 3.7: CREATE MORE NON-MOTORIZED TRANSPORTATION OPPORTUNITIES

- Site new buildings and affordable housing close to public transportation and services
- Increase locations and use appropriate design for parking bicycles, scooters, trikes, ebikes, etc.
- Add “must stop for pedestrians” signage, pavement markings and/or signal devices to promote non-motorized transportation and walking

OBJECTIVE 3.8: EXPAND COMMUNITY SUPPORT FOR BIKING

- Expand, map out and communicate existing bike lanes and racks throughout Lansing
- Identify biking corridors that currently pose significant risk to cyclists
- Maintain bike lanes and trails to reduce the degradation of these corridors
- Implement new designs for bike lanes that use physical barriers between cyclists and motorized vehicle traffic; designs could employ berms or bollards or rely on parking-protected bike lanes
- Redesign existing unprotected bike lanes and build new bike lanes where none exist.
- Expand upon Lansing’s bicycle parking ordinance by identifying existing sites with inadequate bike storage infrastructure and constructing new bike racks accordingly
- Invest in community bike maintenance services and organizations
- Expand on the work done by CATA to explore the possibility of a regional bike-share program in the Lansing area
- Provide safe bike corrals at events, festivals and other activities within the city to promote non-motorized transportation
- Encourage the use of e-bikes and research the possibility of incentivizing their use

OBJECTIVE 3.9: CREATE SAFE AND WALKABLE STREETS FOR PEDESTRIANS

- Identify areas with inadequate pedestrian infrastructure
- Prioritize underserved neighborhoods by refurbishing damaged and dangerous sidewalks and provide adequate lighting
- Identify high-risk pedestrian intersections and improve and maintain crosswalk provisions and technology
- Ensure completion of the LED streetlight conversion program
- Work with the business community to establish pedestrian friendly street zones in popular commercial districts
- Encourage the use of e-bikes and research the possibility of incentivizing their use

OBJECTIVE 3.10: DECREASE SINGLE-OCCUPANCY VEHICLE USE

- Research how other communities are combatting this
 - Establish a tiered public parking rate that eliminates universally-free parking while decreasing the burden on low-income populations
 - This may increase the overall cost to park but preserve lower rates for low-income residents and residents in need of specific parking accommodations
- Use increased parking revenues to fund carbon-neutral projects
- Explore the possibilities for regulating and disincentivizing private parking lots (e.g., through tax, zoning, renovation incentives, etc.)

CONSERVATION & PROTECTION OF WATER RESOURCES

This section describes science-based policies and actions that can be adopted to reduce water usage, increase pollution prevention measures, protect our source of drinking water, and mitigate the causes and effects of flooding. Protecting and ensuring our community's water resources remain clean and abundant is an integral part of municipal climate action planning. This will require an assessment of water quality and includes stormwater management and fresh/drinking water consumption. Communities all around the world are engaged in planning to reduce the effects of increasingly extreme weather events. Green Infrastructure is a cost-effective way to build protective measures into our cityscape by working with the environment instead of against it. In the context of water conservation, it means that when we build, we are building so that water is filtered and absorbed by the soil where it falls. By promoting absorption of rain fall into the soil, this then helps to recharge our local groundwater resources. With larger storms and floods predicted for Michigan in the future, investing in city-wide green infrastructure projects will help to ensure Lansing is a safe and resilient city.

CURRENT EFFORTS

City of Lansing staff work diligently on the maintenance required by the National Pollutant Discharge Elimination System (NPDES) permit to operate and discharge from its Municipal Separate Storm Sewer System (MS4). The City is engaged in many pollution prevention and sustainability activities to maintain compliance with this permit. Green infrastructure projects such as rain gardens and a bioretention swale system can be found in Lansing. There are also local and regional education and outreach efforts on topics such as use of fertilizers, picking up pet waste, proper car washing practices, and proper disposal of toxic and potentially polluting products. Additionally, the City published their updated wellhead protection plan in April 2021. This plan is part of a voluntary program through the State of Michigan to protect public water supply systems that use groundwater from potential sources of contamination. As a community who relies almost exclusively on groundwater for drinking water needs, these plans help to protect the quality and quantity of local groundwater resources.

ENVIRONMENTAL JUSTICE CONSIDERATIONS

Communities of color are 40% more likely to experience drinking water systems in violation of the law and stay in violation for multiple years (Pullen Fedinick et. all, 2019). This strong correlation between people of color and the ongoing inaction of governments to repair and provide safe drinking water is a statistic that cannot be ignored. BWL drinking water continues to meet or exceed all quality standards established by the U.S. Environmental Protection Agency (EPA) and the Michigan Department of Environment, Great Lakes, and Energy (EGLE), although we must remain attentive.

Stormwater runoff is an issue that causes both pollution and localized flooding of and damage to streets, homes, and businesses- often impacting Lansing's most vulnerable households. A report from the EPA found that "minorities, those with low income, people with limited English proficiency, and certain immigrant communities are at increased risk of exposure to flooding given their higher likelihood of living in risk-prone areas and locations with poorly maintained infrastructure" (EPA c, 2021). Studies have also shown that risk of flood damage to lower-income homes is much greater than the risk to wealthier homes (Osberghaus, 2021).

Investment in neighborhoods that have historically experienced decades of underinvestment is imperative to improving the resiliency of our most vulnerable communities under the prospect of increasing flood risks with climate change. The Combined Sewer Overflow systems discharge untreated sewage and polluted runoff into the Grand River during heavy rain events. While the City of Lansing is working to separate the sanitary and stormwater systems, this project will take years to complete. The existing system cannot always ensure the river is safe for those who live nearby. We must be diligent, complete current projects, and do everything to protect and improve our rivers' water quality.

RECOMMENDED ACTIONS

OBJECTIVE 4.1: MAINTAIN AND ENHANCE EXISTING STORMWATER INFRASTRUCTURE

- Continue to update aging infrastructure to the fullest extent that funding allows, while also searching for funding opportunities to expand improvements
- Review and update policies as needed to accommodate expected changes in storm surges and extreme weather events
- Preserve and protect our lakes, river and streams and reduce stormwater pollution by prioritizing green infrastructure, educating residents and improving watershed health throughout the region

OBJECTIVE 4.2: MAINTAIN AND ENHANCE EXISTING DRINKING WATER INFRASTRUCTURE

- Partner with BWL to conduct a community water audit to better understand areas of improvement, community needs, and have data to develop water usage forecasts
- Prioritize the safety and security of the water infrastructure to ensure the delivery of safe drinking water and treated wastewater
- Work toward accurately measuring water use and identifying areas where infrastructure should be updated



OBJECTIVE 4.3: INCREASE THE APPLICATION OF GREEN INFRASTRUCTURE

- Review and update zoning laws to include and emphasize the need to apply green infrastructure principles
- Encourage projects that increase the amount of permeable surfaces and pavements throughout the city
- Maintain and protect riparian buffer zones to prevent erosion and sedimentation in our rivers and streams
- Encourage the use of rain collection systems and distribute rain barrels where possible
- Provide incentives for buildings that utilize green roofs and green walls; this results in a cooling effect, sequesters rainfall and carbon, provides pollinator habitat, and can be used as a food garden
- Establish urban green space requirements and identify additional areas to be rehabilitated as public green space
- Prioritize the use of native plants, grasses and compost in City parks and roadsides as well as by residents and business owners to allow water to run off from roads and be absorbed easily by the adjacent landscape; the soil and roots also serve as natural filtration devices by filtering out pollutants and toxins from the moving water
- Utilize rain gardens in largely paved areas for water to be able to flow past concrete and directly into the soil; the soil in rain gardens is held tightly together by native plants, typically with deep-reaching roots and pollinator-friendly plants
- Utilize compost and compost products that increase the capacity of the soil to capture moving water, nutrients, and pollutants
- Pursue the development of a storm water utility to pay for storm water management through direct charges to benefitted properties

OBJECTIVE 4.4: INCREASE EDUCATION FOR RESIDENTS ABOUT FLOOD RISKS, PREVENTION MEASURES AND WATER CONSERVATION EFFORTS

- Orchestrate public education events and activities that use a holistic approach to teaching young children about the science of watersheds and their benefits
- Partner with neighborhood groups, professional organizations, and nonprofit organizations when delivering watershed education
- Educate residents about the total costs involved with water use, including energy costs of treatment and distribution, and indirect costs such as greenhouse gas emissions
- Provide education on keeping drains free of fats, oils and grease (FOG)
- Provide educational opportunities for property owners about ways they can make their homes more water efficient
- Provide educational opportunities for property owners about maintenance they can perform that lessens the impacts of flooding on their homes
- Promote financial and technical assistance opportunities that are available to homeowners and renters that can make their homes more water efficient

OBJECTIVE 4.5 CONTINUE TO IMPLEMENT THE GOALS OF THE CITY OF LANSING'S WELLHEAD PROTECTION PLAN

- Identify existing and future threats to groundwater resources and take action to eliminate or minimize these threats.
- Educate the community on where their drinking water comes from and how to protect it to gain their support and participation in the process.
- Coordinate with other organizations, wellhead protection teams, and stakeholders to assure protection of regional drinking water sources.
- Plan for water supply emergencies by keeping Emergency Response Plans up to date and coordinating with the local large water-users group in case of emergencies.
- Incorporate wellhead protection into the planning process for the City of Lansing to protect existing and future drinking water well site locations.

LAND USE

Decisions made about land use will have an impact on nearly every aspect of our lives, from housing and schools to infrastructure and future economic development. Sustainable land use is the concept of managing land in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs. Quality of life, environmental health, housing, public health and a variety of other issues can be impacted by land use policy.

Land use is the foundation of strong neighborhoods and a resilient city. Quality of life and the maintenance of human-centered, walkable, and economically strong neighborhoods are at the center of urban land-use sustainability. Lansing will benefit from focusing on nature-based features and activities that protect human health and the environment, while contributing to a better quality of life for all citizens.

CURRENT EFFORTS

The 2012 Design Lansing Master Plan demonstrates a commitment to sustainable land use, prioritizing green infrastructure and other sustainable practices. For example, Solar Energy Systems are now allowable by-right in all zoning districts with minimal regulating provisions. As Lansing strives to enhance the quality of life for residents, businesses and industry, while also protecting the environment, a continued prioritization of these values must continue and be built upon.

ENVIRONMENTAL JUSTICE CONSIDERATIONS

Redlining, an unethical and discriminatory practice that puts services (financial and otherwise) out of reach for residents of certain areas based on race or ethnicity, began in the 1930's and continued through the mid-1960's. This time period was also when most populated cities grew to the size they are today and were inevitably designed around this predatory practice. Today, redlining is still harming the same neighborhoods. A 2020 study of 108 of the most populated cities in the U.S. showed in almost every city that formerly redlined neighborhoods were significantly hotter than other neighborhoods, some by almost 13 degrees Fahrenheit (Hoffman, 2020). Another study showed, it was shown that formerly redlined neighborhoods on average have about half as many trees as wealthy predominantly white neighborhoods (Locke et. al, 2020). This difference in temperature and lack of tree canopy exacerbates the heat island effect, exposing residents to higher temperatures, higher electricity bills for cooling, and placing those with pre-existing health conditions at greater risk to heat-related stress.

Additionally, some of the most vulnerable people often do not have access to affordable, healthy food, accessible parks, and other basic items. Overcoming these barriers is essential in our land use and planning efforts if Lansing is to become a more equitable place for all citizens.



RECOMMENDED ACTIONS

OBJECTIVE 5.1: EXPAND TREE COVER, CREATE A HEALTHY URBAN TREE CANOPY, AND SUPPORT FORESTRY INITIATIVES

- Conduct a thorough tree canopy assessment and tree inventory and ultimately set a tree canopy goal and carbon sequestration target
- Prioritize tree planting and maintenance especially in disadvantaged areas of the city
- Aid residents in removing dead and dying trees that are unsafe

- Support the City of Lansing Forestry Department by exploring workforce training programs for Certified Arborists and other ways to assist with the lack of labor and other resources
- Pursue sustainable models for urban wood utilization designed to adopt the highest and best use of downed trees, working toward alignment with state and national urban wood utilization practices and goals

OBJECTIVE 5.2: PRIORITIZE FOOD SECURITY THROUGH SAFE, SUSTAINABLE PROGRAMS AND INITIATIVES

- Dismantle food desert models by encouraging and incentivizing neighborhood “mini grocery stores” in neighborhoods distant from large grocery stores
- Support local farms, farmers markets and community gardens
- Encourage home gardens through education, training, and providing resources and technical assistance when available; partner with local community and neighborhood organizations in these efforts in order to reach the maximum number of residents
- Work with existing community organizations to incentivize community gardens on vacant lots
- Promote beekeeping practices and encourage their use in community gardens
- Support community farms with the logistics of donating surplus harvest to the Greater Lansing Food Bank
- Encourage and provide street space for food trucks, both ready-to-eat as well as fresh vegetables and fruits
- Allow permitting residents to raise chickens, ducks, and/or turkeys
- Organize and encourage neighborhood potlucks that include some type of informational, recreational, or culturally significant element

OBJECTIVE 5.3: INVEST IN AND INCENTIVIZE NEIGHBORHOOD FEATURES THAT MINIMIZE ENVIRONMENTAL IMPACT

- Encourage a reduction in traditional, non-native, grass-only lawns, and encourage and incentivize lawns that feature native plants, food-producing and biodiverse gardens, and tree planting
- Provide education for residents willing to replace their grass and/or create rain gardens, amending ordinance if necessary
- Where grass is necessary or preferred by property owners, support its replacement with drought tolerant and low-mow species
- Prioritize widespread pollinator habitat planting and protection
- Establish native species planting guidelines

OBJECTIVE 5.4: ENCOURAGE AND INCENTIVIZE MIXED-USE NEIGHBORHOODS THAT ARE DESIGNED USING SUSTAINABILITY PRINCIPLES OF ECONOMIC PROSPERITY, HUMAN HEALTH, AND ENVIRONMENTAL HEALTH

- Conduct assets and needs mapping of neighborhoods
- Encourage and incentivize higher-density housing alternatives where appropriate
- Ensure the availability of safe, affordable housing
- Support small businesses walkable from neighborhoods that offer healthy and affordable food options
- Provide education to residents and promote opportunities for them to install solar panels on their homes and properties
- Maintain healthy and vibrant public green spaces in every neighborhood that utilize native vegetation and landscaping
- Encourage and promote cultural festivals centered in their respective neighborhoods
- Incorporate low impact solutions to help people respond to extreme weather

OBJECTIVE 5.5: ENHANCE AND PRIORITIZE RESILIENCY MEASURES

- Create resiliency hubs to ensure basic services to those effected by extreme weather events and to protect human health and increase climate resiliency for vulnerable populations
- Invest in public micro-grids for the unhoused population and other vulnerable populations to have access to electricity and Wi-Fi in a safe, temperature-controlled environment
- Work with stakeholders to educate and reinforce Lansing's hazard mitigation efforts

OBJECTIVE 5.6: WHEN REVIEWING NEW DEVELOPMENTS, USE GREEN URBANIZATION PRINCIPLES TO PROTECT CRITICAL NATURAL AREAS AND BEST BENEFIT HUMAN HEALTH AND WELLNESS

- Encourage the consideration of sustainability measures in all new builds and remodels in the planning process, well before construction
- In addition to ensuring that Lansing's buildings are as energy efficient as possible, we must work to ensure that new commercial, industrial, institutional, multi-family, and mixed-use buildings use materials with a low carbon footprint, such as mass timber, which also stores carbon sequestered by trees in the forest. Therefore, the City must support and promote tools that expand the use of the mass timber, salvaged wood, and other emerging sustainable building materials.
- Focus new developments in areas that are already paved or require new developments in currently unpaved areas to implement strict water permeability measures
- Review and update zoning and planning procedures to prioritize green urbanization
- Update site review process to reflect our environmental priorities of waste reduction, energy efficiency, renewable energy, clean and easy transportation, and water conservation
- Promote cluster development, where buildings and pavement in residential areas are closer together and share larger amounts of common green space

OBJECTIVE 5.8: MAKE URBAN SPACES MORE FUNCTIONAL, ATTRACTIVE AND SUSTAINABLE

- Encourage public art on large, exposed building walls, and trails
- Consider the use of roundabouts instead of traffic signals at qualifying intersections
- Identify popular birdwatching sites with signage and the species likely to be seen and when they are usually seen
- Plant pollinator habitat in all available unused grow space in selected city-owned areas

OBJECTIVE 5.9: PRIORITIZE HEALTH, SAFETY, ACCESSIBILITY, AND QUALITY OF LIFE FOR ALL RESIDENTS

- Survey air quality in neighborhoods with excessive odor or pollutants
- Test lead blood level in children living in housing likely to have been painted with lead paint
- Encourage increasing the number of homes with an entrance without steps
- Survey incidence of asthma by neighborhood
- Investigate methods to decrease noise pollution in residential areas
- Create an equity toolkit and provide training to prioritize funding decisions and programming investments

MATERIALS MANAGEMENT

The City of Lansing operates a long-running, successful recycling and waste management program. However, a more robust program will result in a higher recycling rate and includes the collection of food waste, as well as one that offers recycling to all citizens, including those living in multi-family dwellings. Additionally, we must start to think differently about the products we use. By placing an emphasis on sustainable materials management, we must also look at products through a life cycle design lens and consider how the things we purchase and use have an impact on the environment. Ultimately, we must prioritize the transition away from the traditional linear economy to a circular economy. In our current economy, we take materials from the Earth, make products from them, and eventually throw them away, the process is linear. But in a circular economy, products are designed with the end of the life in mind to ultimately avoid the generation of waste, so products and raw materials are reused as long as possible.



CURRENT EFFORTS

The City of Lansing is a leader in providing responsible recycling and waste management services. As one of the first communities in Michigan to provide curbside recycling, Lansing's program began in 1990 with a citizen-led initiative. Operated by Capital Area Recycling and Trash (CART), our award-winning program has grown in both participation and volume. CART also provides yard waste collection services to single-family households in Lansing, where the material is delivered to local facilities and processed into compost and mulch.

CART provides subscription-based commercial recycling services, which includes a limited number of apartment complexes and other multi-family properties. Additionally, public space recycling is provided in downtown areas and seasonally in several parks and ballfields.

The recycling participation rate in Lansing is approximately 75%. The diversion rate, or the percentage of waste that was originally destined for landfill but was instead recycled or composted, was last calculated at 34%. The City of Lansing's recycling program recovers between 5,500 and 6,000 tons of materials annually.

ENVIRONMENTAL JUSTICE CONSIDERATIONS

The transportation and disposal of waste generate some of the most dangerous and abundant pollutant sources that can affect human health. The majority of these facilities are located in communities of color and low-income communities, otherwise referred to as environmental justice communities (Baptista & Perovich et. all, 2019). Landfilling waste can lead to higher greenhouse gas emissions, groundwater contamination, harmful runoff into waterways, and nuisance odor. The City of Lansing does not own or operate a landfill, recycling center or yard waste facility. We can only work to influence how these sites are managed, as we have limited control over them. Lansing must make strides toward providing comprehensive recycling and recovery opportunities for all citizens, including those who live in multi-family housing. To take steps towards environmental justice in our waste management, we must diligently hold our materials management and waste disposal practices to a high standard, and provide equitable access to recycling opportunities.



RECOMMENDED ACTIONS

OBJECTIVE 6.1: INCREASE RECYCLING PARTICIPATION AND TONNAGE

- Develop a convenient drop off site for traditional materials, expanding access to those without curbside pickup
- In partnership with the County, local scrap metal facilities and other stakeholders, increase the recovery of appliances, scrap metal, and bulk waste by reducing barriers and incentivizing participation
- In partnership with the County and other stakeholders, recover more difficult to recycle items such as electronics, batteries, polystyrene (Styrofoam) and paint, through a convenient permanent drop off site
- As an identified key contributor to carbon emissions, freon-containing items from residential and small commercial establishments should be prioritized for recovery and management through special programs/incentives
- Work with Ingham County to increase and expand local hazardous waste collection opportunities and promote their availability to the community by encouraging increased collection opportunities
- Provide continuous education and outreach aimed at maximizing residential participation in recycling and yard waste collection programs, minimizing the recycling contamination rate, and generally increasing tonnage of recycling collected
- Expand opportunities for commercial and multi-family residential recycling and explore the need to require property managers and local haulers to provide service options that include recycling
- Provide continuous education and outreach aimed at maximizing residential participation in recycling and yard waste collection programs, minimizing the recycling contamination rate, and generally increasing tonnage of recycling collected

OBJECTIVE 6.2: INCREASE ORGANICS DIVERSION

- Collaborate with regional partners for the organized collection and processing of yard waste, food waste, and other organic materials
- Identify and work to remove barriers such as cost, lack of trucks, lack of curb carts, etc. that prevent the City from collecting organics year-round
- Promote and encourage backyard composting, grasscycling, and mulching to residents
- Research compost bin availability and incentivize bin distribution to encourage backyard composting
- Encourage use of compost in building, road and other infrastructure projects

OBJECTIVE 6.3: REDUCE WASTE

- Discourage use of single-use plastics and other disposable and non-recyclable products and packaging through education
- Promote waste reduction and provide examples on easy ways to incorporate waste reduction practices into homes and businesses
- Partner with local restaurants, coffee shops and other businesses to provide incentives for customers to bring in their own reusable containers, cups, and more
- Explore ways to reduce or eliminate the use of materials such as polystyrene foam, plastic water bottles, plastic grocery bags and other disposable/single use items
- Commit to using the compost manufactured from local organic waste in public landscapes to improve soil health, increase water retention, and promote percolation capacity in landscaping

OBJECTIVE 6.4: IMPLEMENT ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) POLICY WITHIN THE CITY OF LANSING MUNICIPAL OPERATIONS AND USE AND PROMOTE AS MODEL POLICY FOR OTHER BUSINESSES AND GOVERNMENT ENTITIES TO ADOPT

- Begin to address life cycle costs of products and incorporate into purchasing decisions
- Develop comprehensive and easy-to-access best practices on EPP and educate and train employees on them

OBJECTIVE 6.5: DIVERT USEABLE CONSTRUCTION AND DEMOLITION MATERIALS FROM LANDFILLS THROUGH REUSE, UPCYCLING, AND CREATION OF BUSINESS IN THE LANSING AREA

- Create a viable local market that will have a positive effect on the environment, as well as socially, through job creation, along with an economic savings of disposal costs
- Mandate or incentivize the harvest of materials from demolition projects for other uses or recycling or offer incentives to demolition companies based on tons salvaged
- Mandate or incentivize the recycling or reuse of construction waste materials
- Support low-income housing maintenance to conserve embodied energy and resources in built structures

OBJECTIVE 6.6: REQUIRE TRACKING AND MANAGEMENT OF WASTE AND DIVERSION DATA

- Require all licensed waste haulers to annually report their metrics
- Promote a regional approach to coordinating a collaborative data system.

OBJECTIVE 6.7: CREATE AN ENVIRONMENTAL ETHIC THAT VALUES RECYCLING, COMPOSTING AND WASTE REDUCTION

- Enhance and maintain a robust waste education and outreach program.
- Develop an education center at Emterra's Lansing MRF featuring guided tour for residents, community groups, students and others to demonstrate the recycling cycle.

OBJECTIVE 6.8: WORK TOWARDS FOSTERING A CIRCULAR ECONOMY IN THE LANSING AREA BY ENCOURAGING SHARING, REUSING, REPAIRING AND RECYCLING MATERIALS AND PRODUCTS FOR AS LONG AS POSSIBLE TO REDUCE THEIR ENVIRONMENTAL IMPACT

- Conduct a material flow analysis for the Greater Lansing area
- Take an inventory of existing circular activities and examples, use these as inspiration to foster more circular economy activities in the region
- Evaluate current waste strategies and find opportunities for improvement.
- Keep products in use for longer periods of time by using them in new ways instead of landfilling them

CONCLUSION

While this report is the culmination of a great deal of exploration and research, it is not intended to be an end point, rather the beginning. This plan is intended to be a living document, which will be reviewed as new policies and research become available. City of Lansing staff, those who serve on the Sustainability Commission, and other partners and stakeholders will use it as a guide while working through the areas of focus, implementing metrics, reporting successes and identifying additional goals.

Lansing will continue to network with colleagues and other communities, participating in local and global exchange opportunities. Prospects to collaborate with other communities in the region are great. The benefit of pooling resources and sharing ideas will strengthen our collective effort to create an environment where sustainability is incorporated into every design, policy, and decision made.

ACKNOWLEDGEMENTS

The development of this Sustainability Action Plan (SAP) would not have been possible without the vision of City leadership and the dedication and support of City Staff, members of the Mayor's Advisory Commission on Sustainability and other community and environmental leaders.

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SUSTAINABILITY ORGANIZATIONS AND OTHER COMMUNITIES:

The information shared throughout sustainability networks in the State has been invaluable. Organizations such as Local Governments for Sustainability (ICLEI) and Urban Sustainability Director's Network (USDN), as well as communities like East Lansing, Meridian Township and Ann Arbor are just a few examples of those that have shared their plans and other resources.

BENCHMARKING

In energy management, benchmarking is the practice of tracking an entity's electricity, water, and natural gas usage over time in order to gather data on resource consumption. Benchmarking is commonly used to track data in large buildings.

BIORETENTION SWALE SYSTEM

A best practice in stormwater management that uses natural ecosystem services to filter pollutants from stormwater runoff. Bioretention swale systems typically consist of layers of different types of soil below a ponding area planted with native wetland vegetation and a system of perforated pipes below the ponding area that allows the stormwater to drain slowly.

BLUE ROOF

A roof of a building that is designed to capture and divert rainwater to be stored for future use, such as gardening or washing your car.

CARBON NEUTRALITY

Not increasing carbon emissions and using devices such as offsets to reduce carbon in the atmosphere. Net-zero or negative emissions.

CARBON REDUCTION

Acting to reduce carbon emissions in our activities. This can also include taking carbon out of the atmosphere through vegetation or other means.

CIRCULAR ECONOMY

A flow of goods and services through which waste and pollution are eliminated, products and materials are circulated, and nature is regenerated. It is underpinned by sustainability principles and social justice, includes the transition to renewable energy, moves away from extracting finite resources (Ellen MacArthur Foundation).

CLIMATE CHANGE

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.

CLUSTER DEVELOPMENT

A planning technique used when designing the placement of houses, paved areas, and green spaces in new developments such as neighborhoods. Cluster development places houses close together, usually in cul-de-sac fashion, but have expansive, connected backyards that allow for greater tree canopy, recreational green space, and habitat for wildlife.

COMBINED SEWER OVERFLOW [CSO]

An older sewer system that combines stormwater runoff, domestic sewage, and industrial wastewater into one system that overflows, untreated, into a nearby running water source during storm events.

COMMUNITY BULK/BUY SOLAR

When a group of neighbors gather to learn about the benefits of solar as well as realize volume-based discounts if panels and installation are bought as a group. This style of solar purchasing builds community and accelerates the adoption of residential solar energy generation.

COMPOSTING

The practice of turning organic waste into useful and nutrient-rich soil.

DEMAND RESPONSE

A voluntary user-side utility program that pays residents to limit their energy intake from the grid during peak hours in order to stabilize the grid during times of high energy usage.

DISTRIBUTED ENERGY RESOURCES [DER]

A decentralized design of electricity generation and storage that often uses small- and medium-sized systems that are connected to the larger grid. DER provides resiliency in extreme weather events and can easily incorporate renewable energy into the grid, therefore reducing greenhouse gas emissions from fossil fuel-powered plants.

DIVERSION

(In the context of waste management): Any alternative to landfilling waste that does not include burning. This can include reducing, reusing, and recycling waste.

ELECTRIFICATION

The transition from using fossil fuel-powered devices to electricity-powered devices.

ENERGY EFFICIENCY

Using less energy (electricity, natural gas, etc.) to power goods and services.

ENVIRONMENTAL JUSTICE

Environmental justice is the equitable treatment and meaningful involvement of all people regardless of race, color, gender, national origin, ability, or income and is critical to the development and application of laws, regulations, and policies that affect the environment, as well as the places people live, work, play, worship, and learn (EPA, a).

EQUITY

The guarantee of fair treatment, access, opportunity, and advancement for all, while striving to identify and eliminate barriers that have prevented the full participation of some groups.

EV

Abbreviation for electric vehicle. An electric vehicle is a vehicle which uses an electricity-powered battery to operate rather than fossil fuels such as gasoline or diesel.

FOOD DESERT

Urban areas that are devoid of easily accessible, healthy and affordable food choices and are often crowded with unhealthy food options such as fast-food establishments.

GREEN BUILDING PRINCIPLES

Principles utilized in “construction and lifetime of operation [to] assure the healthiest possible environment while representing the most efficient and least disruptive use of land, water, energy and resources” (Alam & Haque, 2016).

GREENHOUSE GASES

Atmospheric gases that retain heat and contribute to global warming. The most common examples of these include carbon dioxide, methane gas, and nitrous oxide.

GREEN INFRASTRUCTURE

Infrastructure such as roads and buildings that work with nature in their design. Green infrastructure is closely related to Low-Impact Design.

GREEN ROOF

A roof of a building that is planted with greenery. Green roofs provide insulation for homes, retain rainwater and decrease stormwater runoff, and create pollinator habitat.

GRID CARBON INTENSITY

The amount of carbon emissions released into the atmosphere as a result of electricity generation for the power grid. Grid carbon intensity is higher when a power grid’s generation mix is mostly made of fossil fuels, such as coal and natural gas, and it is lower when a power grid’s generation mix incorporates more renewable energy that does not emit carbon dioxide and other greenhouse gases.

GLOBAL WARMING

“The long-term heating of Earth’s climate system observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth’s atmosphere” (NASA).

HEAT ISLAND EFFECT

Man-made structures like buildings and concrete pavement that absorb and re-emit the sun’s heat more than a natural landscape does. As the structures continue to emit heat at night, areas of cities do not get the chance to cool down naturally at night. Urban areas that are highly paved with lots of buildings become “heat islands,” with temperatures being around 1-7 degrees Fahrenheit higher than other areas (EPA, b).

IDLING

When a vehicle is left running without moving, generating unnecessary emissions.

MICROGRIDS

A portion of the larger electrical grid that has the capacity to self-operate due to its decentralized generation and control. It can use energy from the larger grid and work independently when needed. Microgrids are often built around renewable energy generation sites.

NOISE POLLUTION

Excessive noise that is harmful or a nuisance to humans and wildlife, often caused by commercial and industrial facilities or traffic.

ORGANICS

Carbon-rich biodegradable materials that come from plants and animals. In waste management, common organic waste of importance are table scraps, lumber, and yard waste such as grass clippings and sticks.

PERMEABILITY

The ability of a surface to allow water to pass through it and into the soil below. This is important in cities to allow for groundwater recharge.

PLANETARY BOUNDARIES

The limits “within which we expect that humanity can operate safely. Transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental-to planetary-scale systems” (Rockström, et. all, 2009).

RAIN GARDENS

Plots of native shrubs, grasses, and wildflowers with deep roots that help stabilize soil, absorb stormwater, and filter pollutants out of runoff.

REDLINING

A predatory practice utilized by the Home Owners' Loan Corporation and the Federal Home Loan Bank Board through the 1960's that denied mortgage loans for houses in selected "redlined" neighborhoods, which were often neighborhoods of color. Denying loans for houses in redlined neighborhoods broke up communities, led to a lack of investment in the infrastructure in the neighborhoods and denied people of color the chance at buying a house and creating generational wealth.

STREETLIGHT CONVERSION PROGRAM

The program that is transitioning streetlights in Lansing from incandescent light fixtures to more energy efficient LED light fixtures.

SUSTAINABILITY

The equitable balance of environmental health, social equity, and economic development that is considered when we are attempting to meet the needs of the present without compromising the ability of future generations to meet their own needs or exceeding planetary boundaries.

TREE CANOPY

The area of the city that is covered with shade from trees. A more expansive tree canopy provides shade on houses and walkways, reducing the need for air conditioning and lowering energy bills, making outdoor recreation in hot days more enjoyable, improving air quality, and sequestering carbon from the atmosphere.

UPCYCLING

Finding a creative way to make a used item into something else that is useful.

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APPENDICES

- GHG Emissions Inventory report
- ICLEI wedge analysis
- City of Lansing Climate Action Plan for Municipal Operations (2020)
- Climate Resolution