



# Sustainability & Climate Action

City of Ann Arbor

May 13, 2019

City Council Work Session



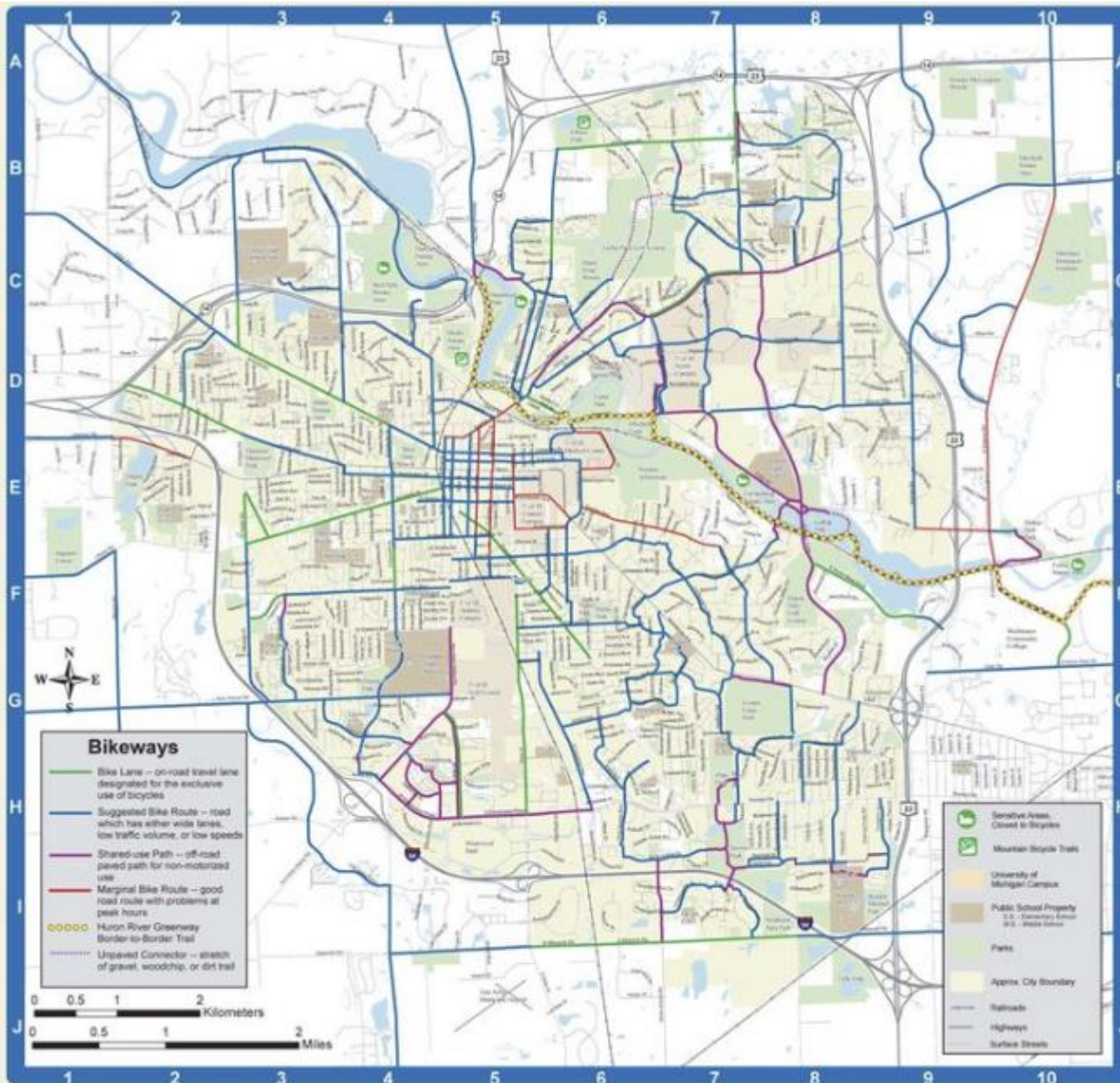
# AGENDA

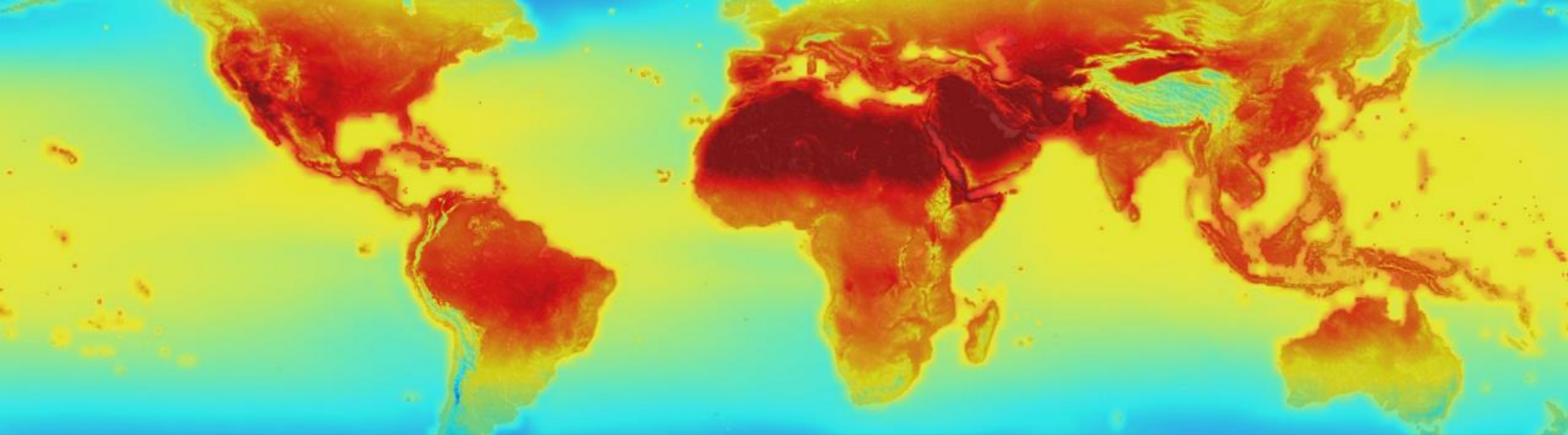
A) State of the Science

B) Where We've Been

C) Where We Are Going

D) Questions, Thoughts, Ideas





# State of the Science

Dr. Jonathan Overpeck (“Peck”)





# Why Does this Matter?





“Without substantial and sustained global mitigation and regional adaptation efforts, climate change is expected to cause growing losses to American infrastructure and property and impede the rate of economic growth over this century.”

~2018 National Climate Assessment





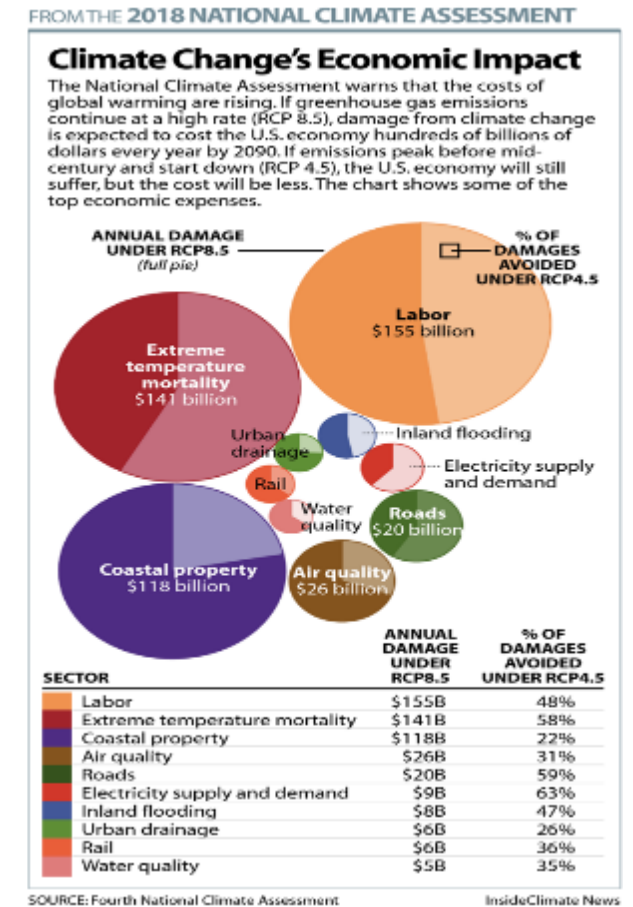
## Infrastructure

Michigan is projected to have 2<sup>d</sup>  
highest infrastructure costs



## Health

Natural disasters and climate change have significant physical, emotional, and mental health impacts



## Economy

\$141 billion from heat-related deaths, \$118 billion from sea level rise and \$32 billion from infrastructure damage by the end of the century, among others

# CLIMATE CHANGE & PEOPLE



The background image shows a city street at night. On the left, there's a brick wall with a glowing lantern. In the center, a large white text box contains a quote. To the right, a tree and a street lamp are visible. In the bottom half, a crowded outdoor dining area with blue and white railings is shown, with people sitting at tables and walking. An Italian flag is visible in the upper left.

“Climate change creates new risks and exacerbates existing vulnerabilities in communities across the United States, presenting growing challenges to human health and safety, quality of life, and the rate of economic growth.”

~2018 National Climate Assessment





# CLIMATE CHANGE IN ANN ARBOR



## Rising Temperatures:

Average air temperature in A2 has increased by nearly 1°F since the 1900s and is expected to rise 3°F to 7°F by 2050.



## Hot Days:

Ann Arbor is likely to experience 12 to 36 more days per year over 90°F by mid-century and 30 to 42 more days per year over 90°F by end of-century.



## More Precipitation:

Total annual precipitation has increased by over 44% since the 1950s and will likely continue to increase in the future, though types of precipitation will vary (i.e., more winter precipitation in the form of rain or ice).



## More Extreme Precipitation:

The total volume of rain falling during extreme events has increased by 37% since 1981 and the number of heavy rainfall events has increased by over 41% since the 1950s. These trends are both projected to continue increasing.





# Racial inequity in Washtenaw County

## TWO FUTURES ONE COMMUNITY

Washtenaw County #1  
county in Michigan for  
health factors



Washtenaw County  
ranked 80/83 for income  
inequality

Ann Arbor - #1 Most  
educated city in  
America



Racial gap of more than  
30-40 points in student  
test scores

#6 Cities that are  
secretly great for tech  
grads



Ann Arbor 8th most  
economically  
segregated city

#3 hottest market  
housing market in the  
country




Washtenaw County #1  
most expensive rental  
market in Michigan

#5 green cities for  
families & #1 city for  
millennials



Bottom 8% for upward  
income mobility

- 60% of African-Americans live in low opportunity areas
- 9 yr. difference in life expectancy between 48104 and 49198
- Compared to white children:
  - Black babies are twice as likely to be born at a low birth weight and six times more likely to grow up in poverty
  - Latino children are 3 times more likely to grow up in poverty



“Climate change affects the natural, built, and social systems we rely on individually and through their connections to one another. These interconnected systems are increasingly vulnerable to cascading impacts that are often difficult to predict, threatening essential services within and beyond the Nation’s borders.”

~2018 National Climate Assessment





# Dickinson, Texas

August 27, 2017

Residents of this nursing home were trapped in flood waters for hours before being rescued.

# Cascading Impacts

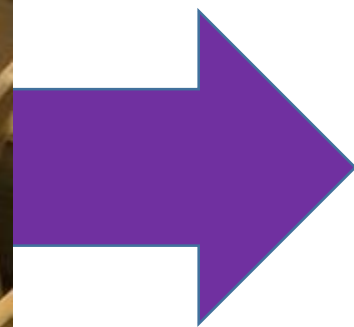




A vintage, sepia-toned map of the United States is the background. The map shows state boundaries, major cities, and geographical features like mountains and rivers. Overlaid on the map is the text "LOOKS LIKE WE'RE ALL MOVING TO MICHIGAN" in large, bold, yellow capital letters. The text is centered and spans across the middle of the image. The map is slightly aged and has a textured appearance.

**LOOKS LIKE WE'RE ALL  
MOVING TO MICHIGAN**





**15** years old





## Where We've Been

# Ann Arbor's Climate and Sustainability Timeline

<b>1982</b> <ul style="list-style-type: none"><li>• Tree City USA designation</li></ul>	<b>1994</b> <ul style="list-style-type: none"><li>• Ann Arbor Energy Plan updated</li></ul>	<b>1998</b> <ul style="list-style-type: none"><li>• Top 20 waste reduction programs in country</li><li>• Municipal Energy Fund established</li></ul>	<b>2001</b> <ul style="list-style-type: none"><li>• Environmental Commission founded</li></ul>	<b>2004</b> <ul style="list-style-type: none"><li>• Green Fleets program initiated</li></ul>	<b>2007</b> <ul style="list-style-type: none"><li>• Ann Arbor selected as a Solar America City</li><li>• 5,000 Solar Roofs initiative (2006)</li></ul>
<b>1981</b> <ul style="list-style-type: none"><li>• Energy Advisory Board founded</li><li>• Ann Arbor Energy Plan adopted</li></ul>	<b>1985</b> <ul style="list-style-type: none"><li>• Energy Commission founded</li><li>• Park rehab. &amp; develop. Millage renewed</li></ul>	<b>1997</b> <ul style="list-style-type: none"><li>• City joins ICLEI Cities Climate Protection</li></ul>	<b>1999</b> <ul style="list-style-type: none"><li>• Clean Cities designation</li><li>• Model Waste Reduction Program of N.A.</li></ul>	<b>2003</b> <ul style="list-style-type: none"><li>• Greenbelt millage approved</li><li>• Natural Features Master Plan</li></ul>	<b>2005</b> <ul style="list-style-type: none"><li>• Mayor Hieftje issues Green Energy Challenge</li><li>• City joins Conference of Mayors Climate Protection Agreement</li><li>• City Council passes Energy Challenge Goals</li></ul>
<b>2018</b> <ul style="list-style-type: none"><li>• Green Fleets Policy updated</li><li>• Office of Sustainability and Innovations formed</li><li>• UM President Schlissel creates task force on carbon neutrality</li></ul>			<b>2016</b> <ul style="list-style-type: none"><li>• Transportation Commission founded</li></ul>	<b>2013</b> <ul style="list-style-type: none"><li>• Sustainability Framework adopted into City Master Plan</li></ul>	<b>2011</b> <ul style="list-style-type: none"><li>• Gold level walk-friendly community</li></ul>
<b>2017</b> <ul style="list-style-type: none"><li>• Ann Arbor joins the We Are Still In Campaign</li><li>• City receives four star certification from STAR Community Index</li><li>• Goal set for 100% renewable energy to power City operations</li></ul>			<b>2015</b> <ul style="list-style-type: none"><li>• City achieves 18% GHG reduction based on 2000 levels</li><li>• Mayor Taylor signs onto the Covenant of Mayors</li></ul>		<b>2012</b> <ul style="list-style-type: none"><li>• Ann Arbor Climate Action Plan adopted</li></ul>
<b>2025</b> <ul style="list-style-type: none"><li>• Goal of 25% reduction in community-wide greenhouse gas emissions</li></ul>			<b>2035</b> <ul style="list-style-type: none"><li>• Goal for 100% clean and renewable energy for municipal operations</li></ul>		<b>2050</b> <ul style="list-style-type: none"><li>• Goal of 90% reduction in community-wide greenhouse gas emissions</li></ul>

**2010**

- Top 20 on-site Green Power Generation Award
- Energy Global Award for Sustainability for LED lighting
- Governmental Award of Excellence in Urban Forestry



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# SINCE OSI FORMATION

- 01 Reinvigorated Green Fleets Team
- 02 City's first 3 electric vehicles purchased
- 03 Completed Solar Faithful Program
- 04 Monthly Sustainability Lunch and Learns
- 05 Solar Power Hours
- 06 Sustainability Forums
- 07 Revised City's Environmentally Preferable Purchasing Policy



# PARTNERSHIP HIGHLIGHT

## 08 Partnership with Ann Arbor Housing Commission

1. Energy efficiency improvements
2. Electrification of appliances
3. Renewable energy installation
4. Battery ready





# PARTNERSHIP HIGHLIGHT

## 09 Partnership with Ann Arbor Fire Department

1. Volunteer solar
2. Energy efficiency improvements
3. Environmentally preferable purchasing enhancements
4. Fire station master plan



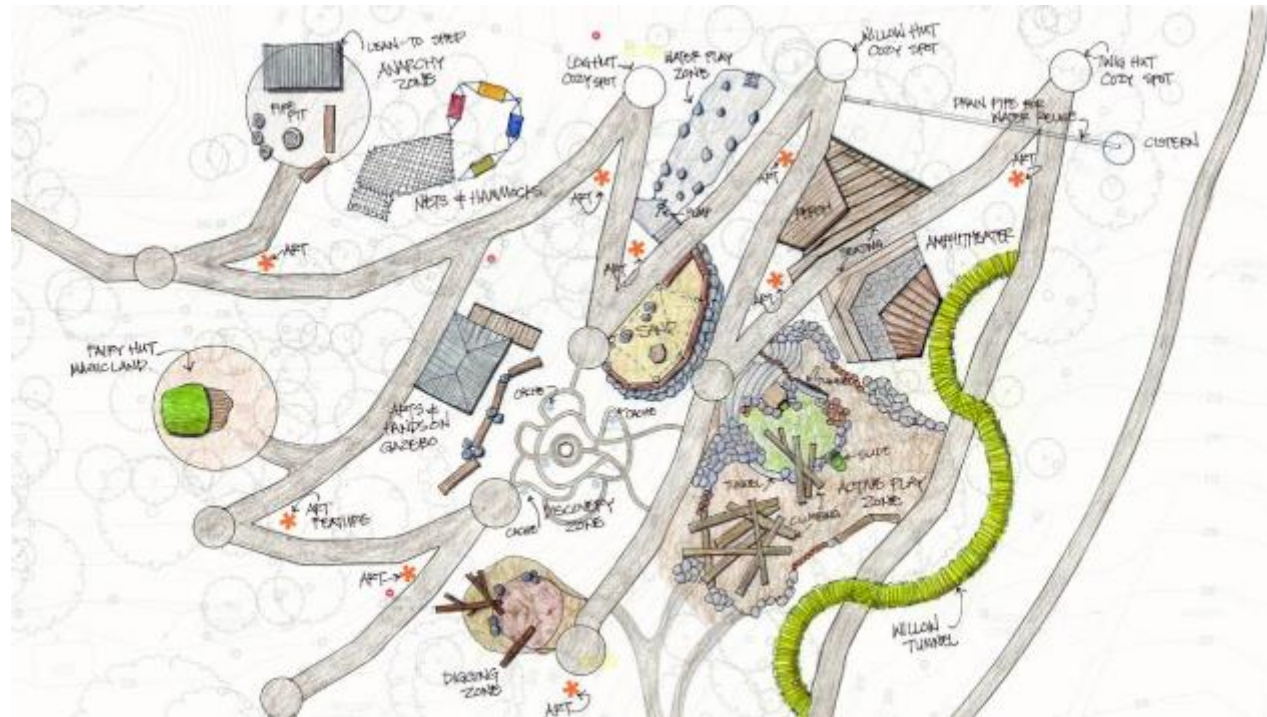
# SINCE OSI FORMATION

- 10 Initiated electric vehicle readiness sub-committee
- 11 Initiated time of marketing (home energy disclosure) working group
- 12 Completed an equity scan of OSI's work plan and the City's Climate Action Plan
- 13 Organizing and hosting second round of equity training for staff
- 14 Working on visualization tool to integrate climate change and equity into all City decisions
- 15 Co-created work place Community Supported Agriculture (CSA) for staff
- 16 Awarded 8 Sustaining Ann Arbor Together (SA2T) grants





# PROJECT HIGHLIGHTS



## Sustaining Ann Arbor Together Grant Program

1. Solar education curriculum
2. Nature -Based playground x 2
3. Holistic environmental education
4. Youth job training
5. Repurposing old bicycles
6. Farmers Market
7. Community built play space



# SINCE OSI FORMATION

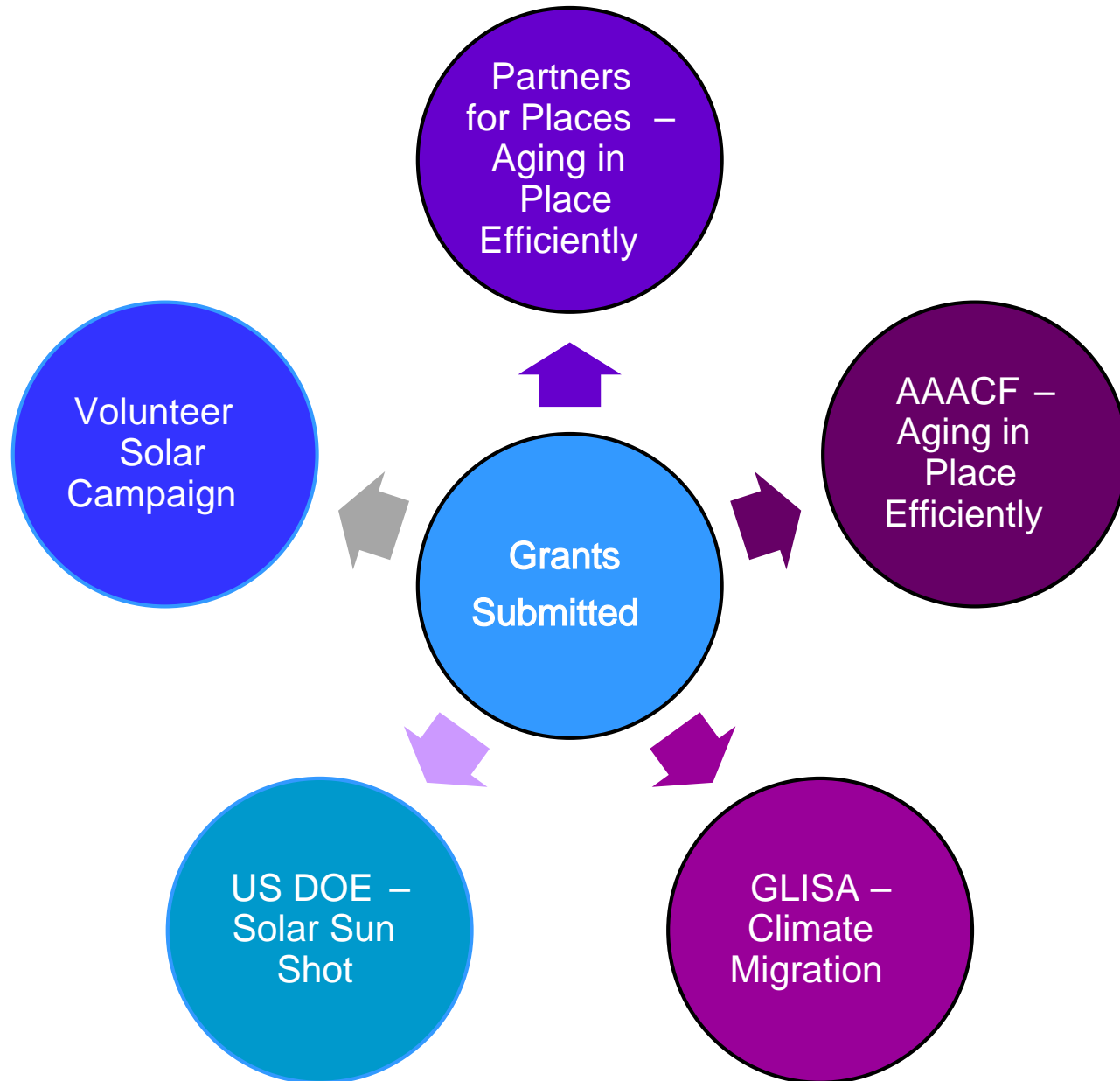
- 17 Filed interconnection paperwork for solar on 13 city facilities
- 18 Exploring feasibility of large-scale solar at the landfill
- 19 Initiated resilience hub outreach
- 20 Exploring expansion of landfill gas collection system
- 21 Launched solar installation and financing RFP
- 22 Launched energy efficiency identification RFP
- 23 Farm to Table dinner to celebrate 100<sup>th</sup> anniversary of the Farmers Market
- 24 Fundraising



# Fundraising

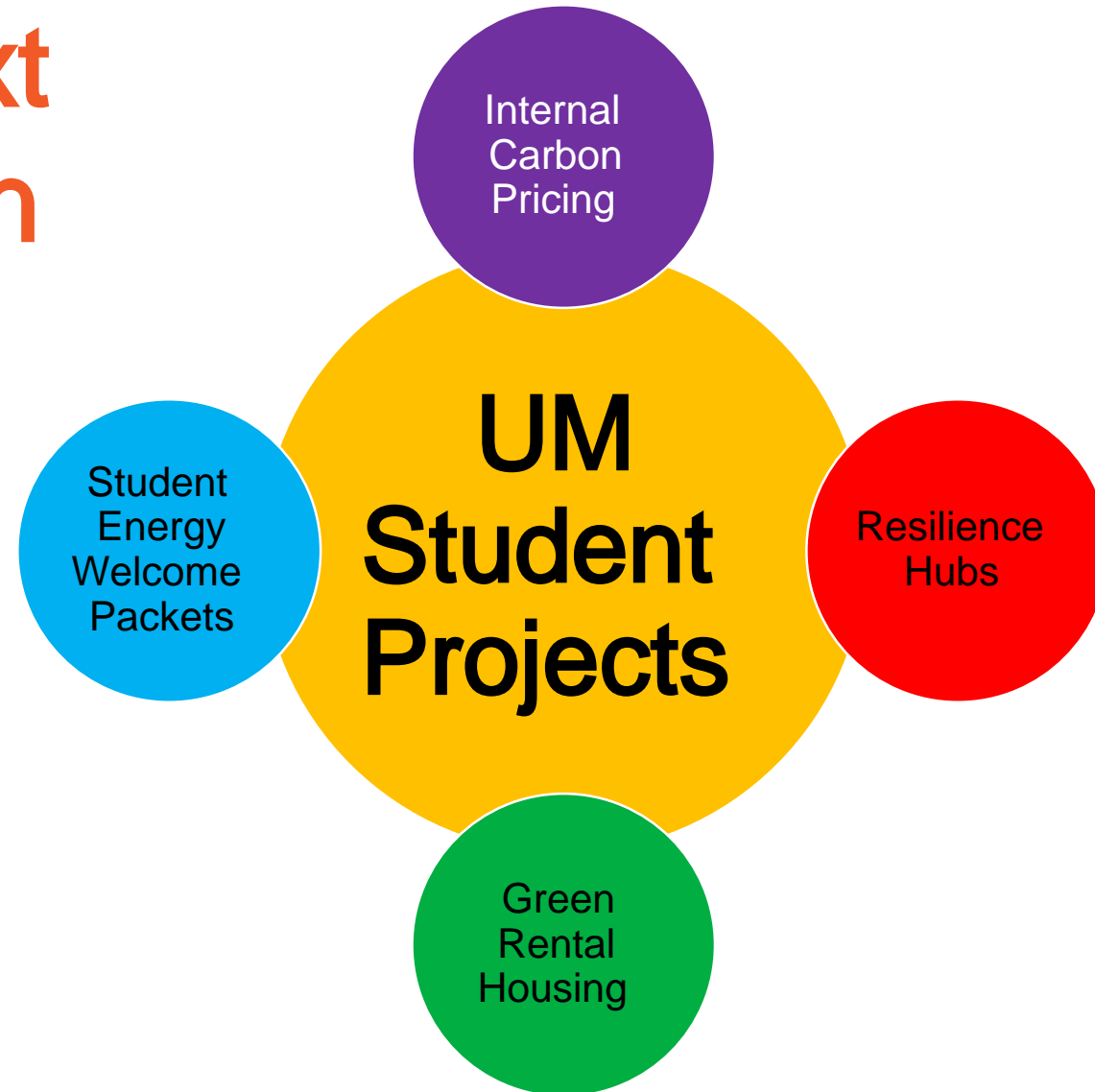


# Fundraising





# Engaging the Next Generation



# Regional & National-Level Service

- 25 Appointed to UM carbon neutrality commission
- 26 Appointed to County's Environmental Council
- 27 Appointed to national Sierra Club task force
- 28 Appointed President of the Board for the American Society of Adaptation Professionals
- 29 Appointed to Michigan Municipal League's Energy and Environmental Committee
- 30 Serving on American Society of Civil Engineers Sustainability Work Group







## Where We Are Going

# **Ann Arbor's 5-Year Work Plan**

**Fiscal Year 2020 – Fiscal Year 2025**

**April 2019**

**Prepared by the Office of Sustainability and Innovations**







Co-Benefits of  
Sustainability  
and Climate  
Action

**GOAL:**  
**25% Reduction in  
Community-Wide  
Greenhouse Gas  
Emissions**

# Office of Sustainability and Innovations Work Plan - FY19-FY24

## MATRIX KEY

<b>Co-Benefits</b> EDU - Education JOBS - Job Creation / Workforce Training NRG - Local Energy Production AIR - Air Pollution Reduction \$\$ - Dollars Stay In Local Economy ENV - Environmentally Friendly	EQU - Benefits the Most Vulnerable; Contributes to One Community Goals SOCO - Leads to Enhanced Social Cohesion COST - Cost Savings Accrued HEALTH - Improves Health of Residents RES - Improves the Resilience and/or Preparedness	<b>Estimated annual savings</b> may accrue to residents, business or the City	<b>Impact Timeframe</b> S - short (1-3 years) M - medium (4-8 years) L - 9+ years	<b>Priority</b> H - high M - medium L - low
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Work Plan Task	GHG Reduction Potential (metrics tons CO2e)	Cost Estimate (non-staffing)	Cost /Ton CO2e	Estimated Annual Savings	Payback Period	Co-Benefits	Impact Timeframe	Priority
<b>RESIDENTIAL</b>								
Time of Marketing	29,336	\$175,000	\$6	\$200,000 = \$1,000,000	0 years	EDU; JOBS; \$\$; COST	M	M
Net Zero Energy Affordable Housing Program	412	\$450,000	\$1,092	\$77,513	5.8 years	EQU; JOBS; NRG; AIR; \$\$; COST	S	H
Green Rental Program	30,844	\$331,000	\$11	\$5,100,000	0 years	EDU; JOBS; AIR; \$\$; EQU; COST	M	H
Aging In Place Efficiently Program	4,165	\$150,000	\$36	\$400,000	0 years	EQU; JOBS; NRG; AIR; \$\$; COST; HEALTH	M	M
Efficiency and Solar In the Community	73,500	\$200,000	\$3	\$500,000 - \$5,000,000	0 years	EDU; JOBS; NRG; A EQU; COST; HEA		
Weatherization Expansion	14,000	\$50,000	\$4	\$250,000 - \$2,000,000	0 years	EQU; EDU; JOBS; \$\$;		
Resilience Hubs	500	\$150,000	\$300	\$40,390	3.7 years	EQU; RES; SOCO; HEALTH; AIR		
Rain Ready Community	944	\$25,000	\$26	Not estimated	Not estimated	RES; EDU; JOBS; \$\$		
Distributed Generation & Innovation Hubs	50,000	\$250,000	\$5	\$250,000 - \$2,000,000	0 years	EDU; JOBS; NRG; AIR; SOCO; HEALTH; CO		
Local Carbon Offset Program	500	\$25,000	\$50	\$80,000	0 years	EDU; NRG; AIR; \$\$		

<b>COMMERCIAL</b>								
Grand Challenge Program	73,500	\$400,000	\$5	\$400,000	1 year	EDU; JOBS; NRG; AIR; HEALTH; ENV		
Solar Faithful	1,300	\$25,000	\$19	\$225,000	0 years	EDU; JOBS; NRG; \$\$; SC		
Green Business Program	7,620	\$150,000	\$20	\$250,000 - \$1,000,000	0 years	JOBS; \$\$; EDU; COS		
Re-Energize UM Relationship	7,126	\$25,000	\$4	\$350,000 - \$3,000,000	0 years	EDU; JOBS; AIR; \$\$; O		

<b>TRANSPORTATION</b>								
EV Program	18,294	\$125,000	\$7	\$2,000,000	0 years	EDU; JOBS; AIR; HE		

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Work Plan Task	GHG Reduction Potential (metrics tons CO2e)	Cost Estimate (non-staffing)	Cost /Ton CO2e	Estimated Annual Savings	Payback Period	Co-Benefits	Impact Timeframe	Priority
<b>MUNICIPAL</b>								
100% Municipal Clean and Renewable Energy Strategy	26,000	\$300,000	\$19	\$3,160,800	0 years	EDU; JOBS; NRG; AIR; \$\$; COST; ENV	M	H
Revolving Energy Fund		\$200,000						
Assisting with Department Energy Purchasing		\$0						
Internal Communication Efforts		\$0						
Net Zero Buildings Policy		\$0						
Internalization of Sustainability Into City Operations	2,633	\$0	\$42	\$20,000-\$200,000	0-5 years	JOBS; NRG; COST	S	M
Michigan Municipal Association for Utility Issues		\$110,000						

<b>CROSS-CUTTING, ENGAGEMENT, &amp; EDUCATION</b>								
Equity Programs / Planning	0	\$25,000	Not Estimated	Not estimated	Not estimated	EQU; SOCO; HEALTH	S	H
Commission Support	0	\$0	Not Estimated	Not estimated	Not estimated	EDU	S	H
Sustaining Ann Arbor Together Neighborhood Grant Program	500	\$250,000	\$500	Not estimated	Not estimated	EDU; SOCO; \$\$; EQU; ENV	S	H
Community Outreach	500	\$100,000	\$200	Not estimated	Not estimated	EDU; ENV		
Forming and Reforming Strategic Partnerships	500	\$25,000	\$50	Not estimated	Not estimated	EDU; SOCO		
National Field Building Efforts	500	\$75,000	\$150	Not estimated	Not estimated	EDU; COST; RI		

<b>TRACKING PROGRESS</b>								
Greenhouse Gas Emissions Inventories	0	\$40,000	Not Estimated	Not estimated	Not estimated	EDU		
Metric Tracking	0	\$50,000	Not Estimated	Not estimated	Not estimated	EDU		







# FY20 & FY21 Priorities

A  
B  
C  
D  
E  
F  
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H  
I  
J  
L

Net zero energy affordable housing

Sustaining Ann Arbor Together grant program

100% clean and renewable city operations

Green Rental Housing program

Home energy disclosure program

Resilience hubs

Green Business Challenge

Aging in Place Efficiently

Weatherization expansion

Efficiency and solar in the community

Ongoing community engagement

# Net Zero Energy Affordable Housing

Use a combination of energy efficiency and solar systems to reduce energy consumption and GHG emissions of our affordable housing units.

**Amount Requested** : \$200,000

**Partner** : AAHC

**Goals:**

- All affordable housing complexes and units are energy positive or neutral by 2035
- Five net zero energy affordable housing sites by 2025
- 90% of residents have improved experiences
- 5-8% reduction in AAHC operating costs by 2035





# Sustaining Ann Arbor Together

Promotes and supports community-based activities in support of the goals of the City's Sustainability Framework.

**Amount Requested** : \$100,000

**Partner** : Neighborhood associations; community members, schools, etc.

**Goals:**

- Ten grants submitted starting in FY20
- \$100,000 allocated starting in FY20



# 100% Clean and Renewable

Energy  
efficiency  
Renewable  
Energy



Electrification  
Revolving  
Energy Fund  
Batteries

**Amount Requested** : \$170,000 + \$100,000 for Revolving Energy Fund

**Partner** : All City departments, utilities

**Goals:**

- Complete energy audits for 10 city facilities in FY20
- Install energy improvements in at least 5 of these facilities by FY21
- Solar on 5 city facilities by FY21



# Green Rental Housing

Program and associated policy requiring rental property owners to meet a minimum efficiency standard before receiving their rental licenses.

**Amount Requested** : \$25,000

**Partner** : Community services

**Goals:**

- Rental efficiency standard established by end of FY20
- Ordinance in place in FY22
- No net increase in rents, outside market rate changes, 3 years after ordinance effective date



# Home Energy Disclosure

Require sellers of a single-family home to obtain and disclose the findings of a Home Energy Score. Will pair with education and access to rebates & retrofits.

**Amount Requested** : \$40,000

**Partner** : Energy & Planning Commissions

**Goals:**

- Ordinance created in FY20
- 1,000 homes disclose energy usage by 2021
- Residential GHG emissions have dropped by 2% by 2021





# Resilience Hubs

Neighborhood-based locations that support existing community needs while fostering year-round resilience.

**Amount Requested** : \$87,000

**Partner** : Community+

## Goals:

- First resilience hub designed by end of FY20
- At least partial implementation of hub by FY21
- Second resilience hub under design by end of FY21
- 200 additional residents have emergency preparedness kits by end of FY21



# Green Business Challenge

Encourages, assists, and recognizes our businesses for engaging in more sustainable behaviors

**Amount Requested** : \$10,000

**Partner** : Businesses

## Goals:

- By the end of FY21 a Green Business Challenge program has been designed in partnership with the community.
- Fifty (50) local businesses participate in the Challenge by 2025.
- Collectively , businesses participating in the Challenge have reduced their energy consumption, waste usage, plastic consumption, and toxic material usage by 10%.

## GREEN BUSINESS CHALLENGE





# Aging in Place Efficiently

Work with local partners to ensure that residents can age in place in energy efficient, and healthy residences.

**Amount Requested** : \$5,600

**Partner** : Aging organizations, energy experts, +

**Goals:**

- Number of seniors registered for program
- 15% reduction in energy usage in 21 low -income senior homes by 2021
- Sustainable funding source identified for the program



# Weatherization Expansion

Expand weatherization services for low income homeowners, increasing the uptake of existing weatherization services and raising income limits to qualify more A2 homeowners for free to low-cost energy efficiency improvements.

**Amount Requested** : \$55,000

**Partner** : Washtenaw County

## Goals:

- Creation of a weatherization expansion initiative for Ann Arbor residents
- 12 Ann Arbor homes weatherized through this expansion by the end of FY 2020



Weatherization Works

# Efficiency and Solar in the Community

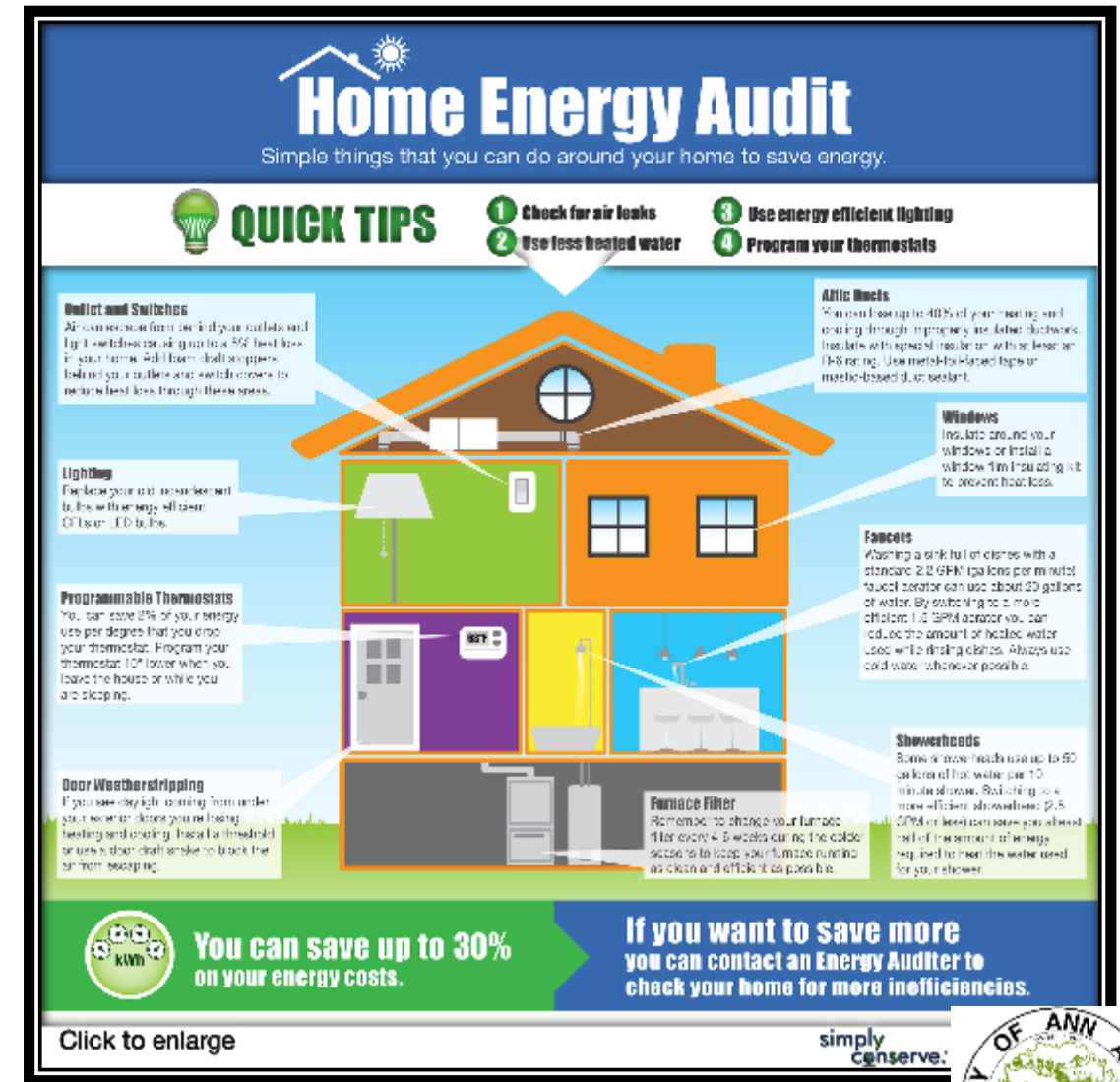
One program to stimulate energy efficiency and renewable energy installations in A2 community.

**Amount Requested :** \$47,096

**Partner :** Community

## Goals:

- Reduced energy bills for Ann Arbor residents through energy efficiency improvements and targeted behavioral changes
- Reduced community-wide greenhouse gas emissions by 5% by 2025
- Run group buy programs that lead to at least 500 new electric vehicles within the community by 2025.





# Take A Ways



- Humanity is conducting an unprecedented experiment with the Earth's climate system.
- We have until 2030 to half global GHG emissions if we want to avoid the most significant climate-related impacts.
- Choices made today will determine the magnitude of climate change risks for decades.
- We know what we need to do and have the skills in A2 to do it!



# “Manage the unavoidable and avoid the unmanageable”

Dr . Missy Stults  
Sustainability and Innovations Manager  
City of Ann Arbor  
[mstults@a2gov.org](mailto:mstults@a2gov.org)

