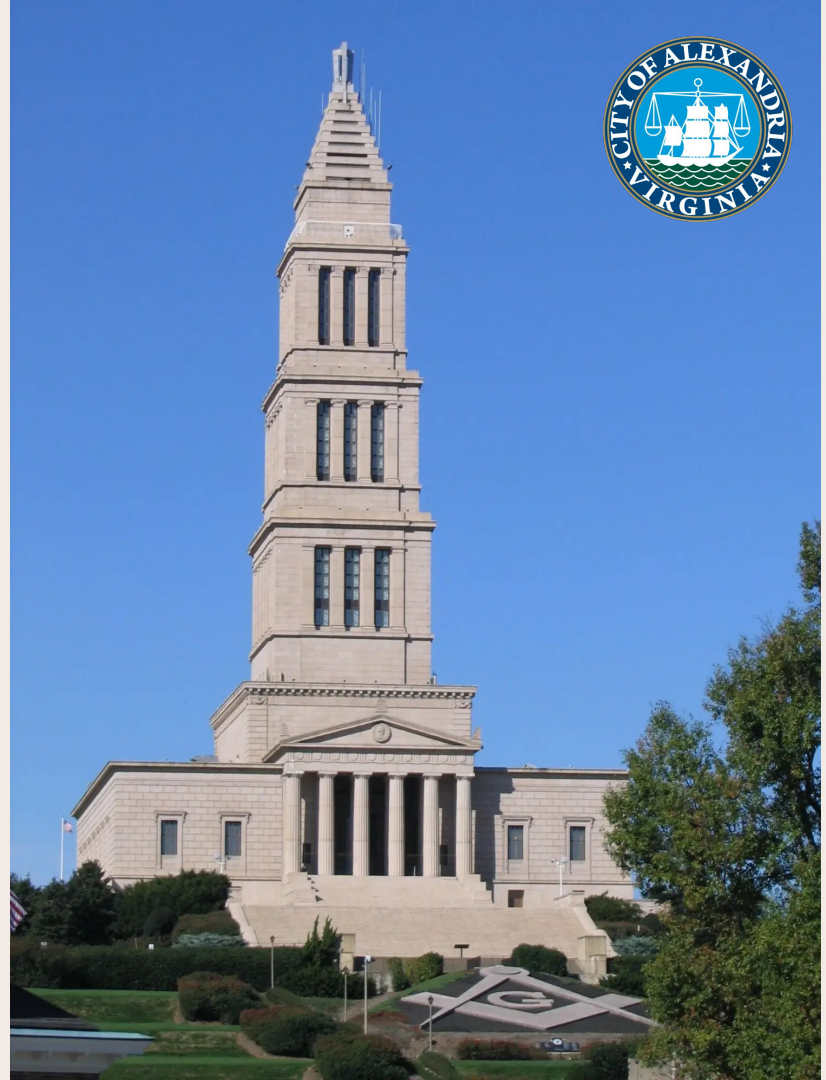




# URBAN HEAT ISLAND (UHI) MITIGATION ALEXANDRIA, VIRGINIA

DECEMBER 11, 2022

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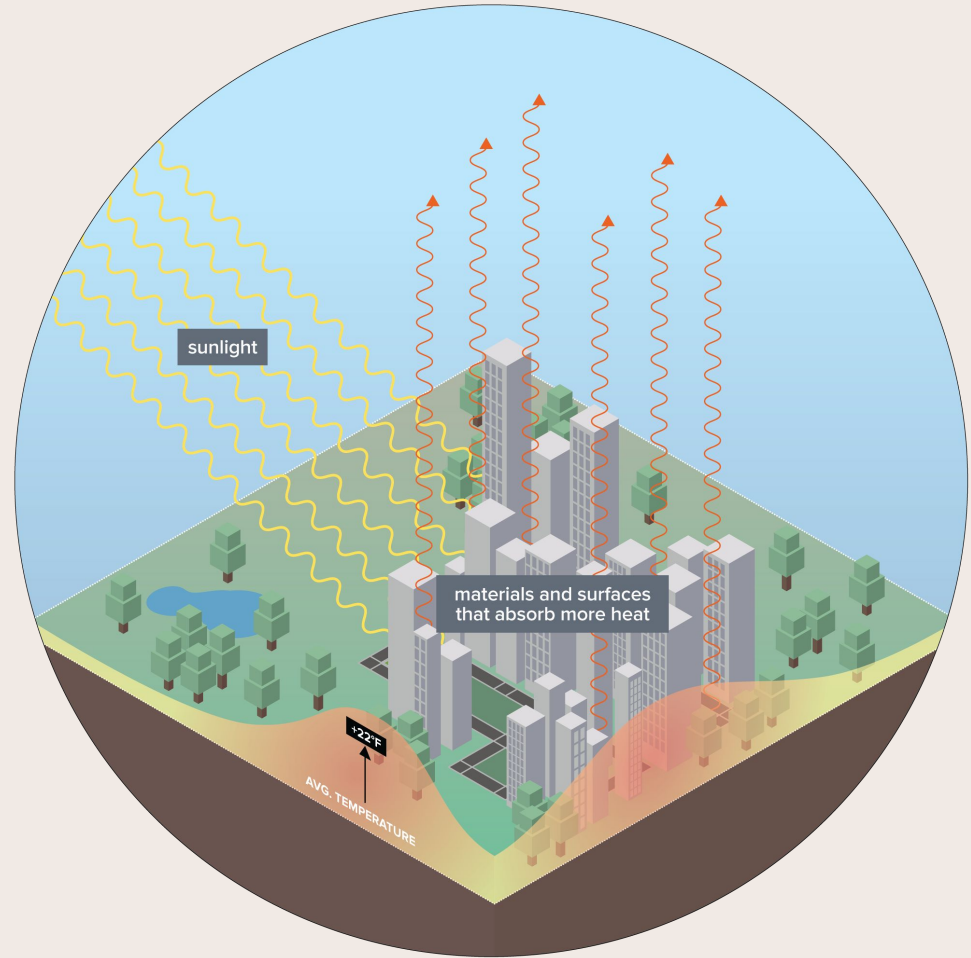


# WHAT ARE UHIS?

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Urban areas that experience higher temperatures than the surrounding suburban areas.

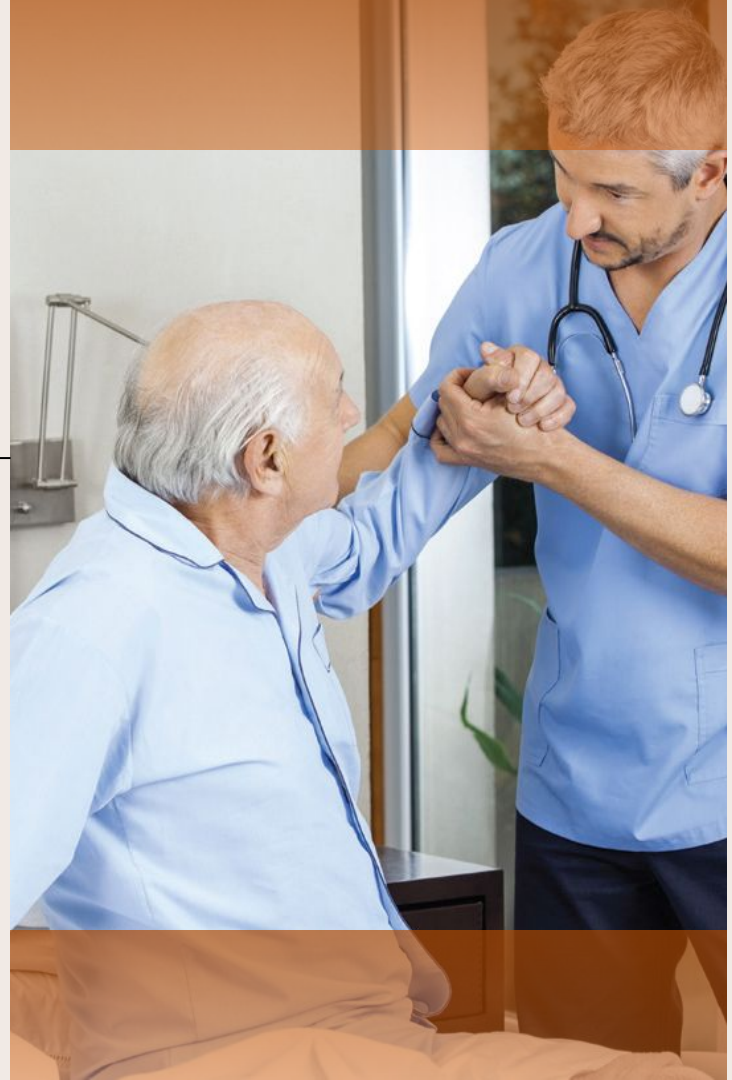
Up to 7° F (~4 °C )  
Warmer!



# WHY IS UHI MITIGATION IMPORTANT?

UHIs can lead to:

1. Health conditions
2. Climate Change
3. Economic Disparity

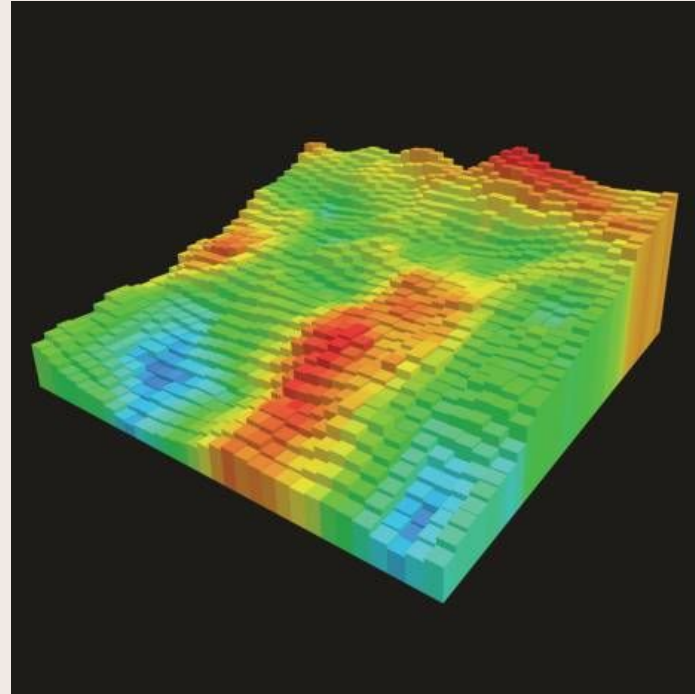


◆ **ALEXANDRIA HAS IMPLEMENTED SOME  
MITIGATION AND ADAPTATION STRATEGIES.**





# ALEXANDRIA HAS IMPLEMENTED SOME MITIGATION AND ADAPTATION STRATEGIES.



A nighttime photograph of a large, multi-tiered fountain in a public square. The fountain's water jets are illuminated from below, creating a bright, shimmering effect. In the background, a large, multi-story brick building with a prominent steeple is visible. A large American flag is displayed on a tall pole in front of the building. The sky is a deep blue with some light clouds. The overall scene is well-lit, with streetlights and building lights contributing to the vibrant atmosphere.

**HELPING THE CITY OF  
ALEXANDRIA, VIRGINIA**

# • PROJECT GOAL •

Provide recommendations that will help the City of Alexandria mitigate the effects of Urban Heat Islands.

# • OBJECTIVE 1 •

Compiled individual, existing geospatial, demographic, and temperature maps into a database



# DATABASE



- Alexandria
- Temperature
- Census and Demographics
- Vegetation and Open Space
- Transportation
- Pavements and Parking





## • OBJECTIVE 2 •

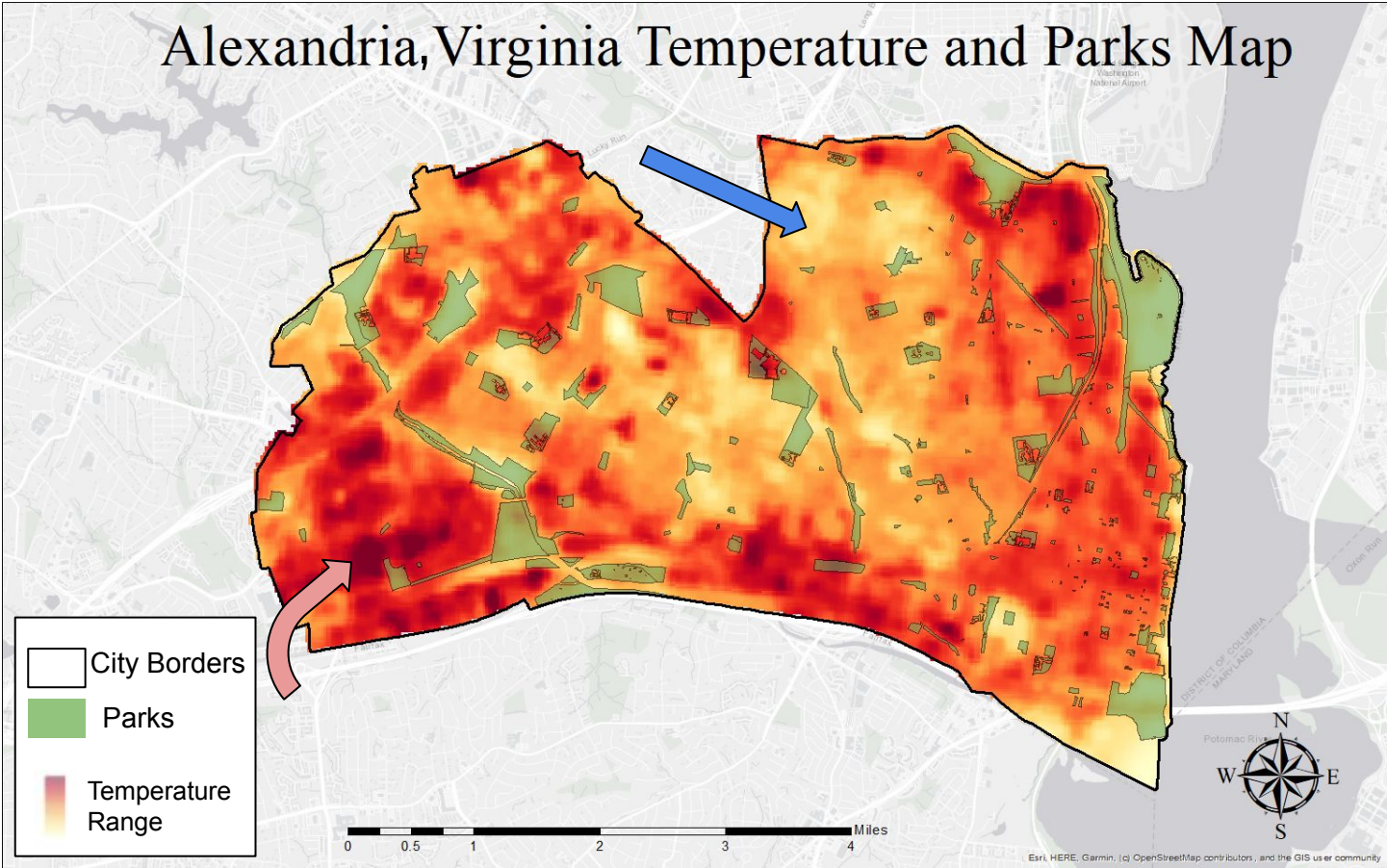
Documented the impact of extreme heat events on critical city infrastructure and vulnerable groups using the acquired geospatial, demographic, and temperature maps.

# RESEARCH GAPS

## HEAT MAPS

- Transportation
- **Traffic**
- Strip Mall
- Pavement
- **Income Housing**
- Topography
- Zoning
- **Green Roofs**
- Cooling Center
- Population Density
- **Parks**
- Open Space Density

# Alexandria, Virginia Temperature and Parks Map



## • OBJECTIVE 3 •

Determined the best Urban Heat Island mitigation strategies and improvements for affected regions of Alexandria based on their physical and socioeconomic attributes.

# STRATEGY OVERVIEW

## DETAILS TO CONSIDER

Strategy	Subtopic	Implemented?	Where?	...
Vegetation	Tree Canopies	Yes, Alexandria has begun to [...]	When planted around [...]	
Water Features	Fountains	No, Alexandria has yet to [...]	It would be most effective [...]	
Outreach	Community Workshops	Yes, Alexandria has started to [...]	Around places where [...]	

# STRATEGY OVERVIEW

## INTERVIEWS

### Group 1:

Human  
Services



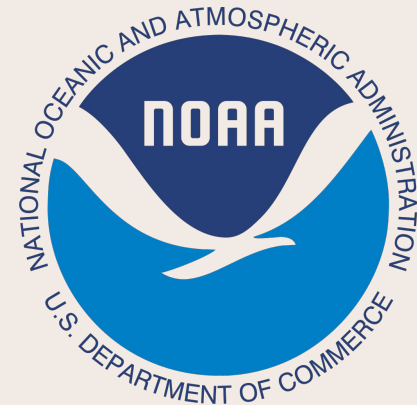
### Group 2:

City Planning



### Group 3:

Other SME





# GROUP 1: HUMAN SERVICES

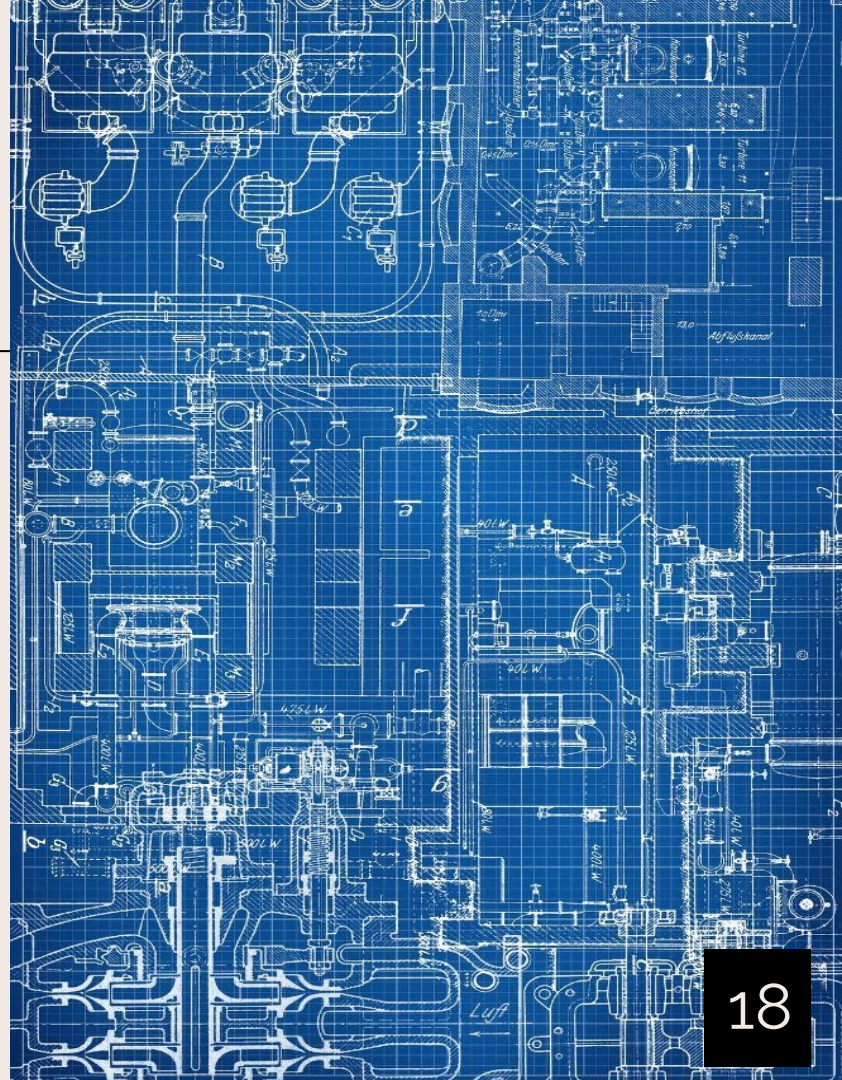
- Office of Housing
- Race and Social Equity Office
- Alexandria Health Department
- Department of Community and Human Services



# ◆ GROUP 2: CITY PLANNING

◆ Department of Planning and Zoning:

- ◆ ● City Architect
- ◆ ● Principal Planner



# GROUP 3: OTHER SME

- Office of Energy Management
- National Oceanic and Atmospheric Administration (NOAA)



# COMMUNITY QUESTIONNAIRE

We Also Asked Members of the Community



## • OBJECTIVE 4 •

Developed a report that provides improvements on current city practices to mitigate the effects of heat islands.



**Cooling  
Centers**

**Cool  
Surfaces**

**Cooling  
Assistance**

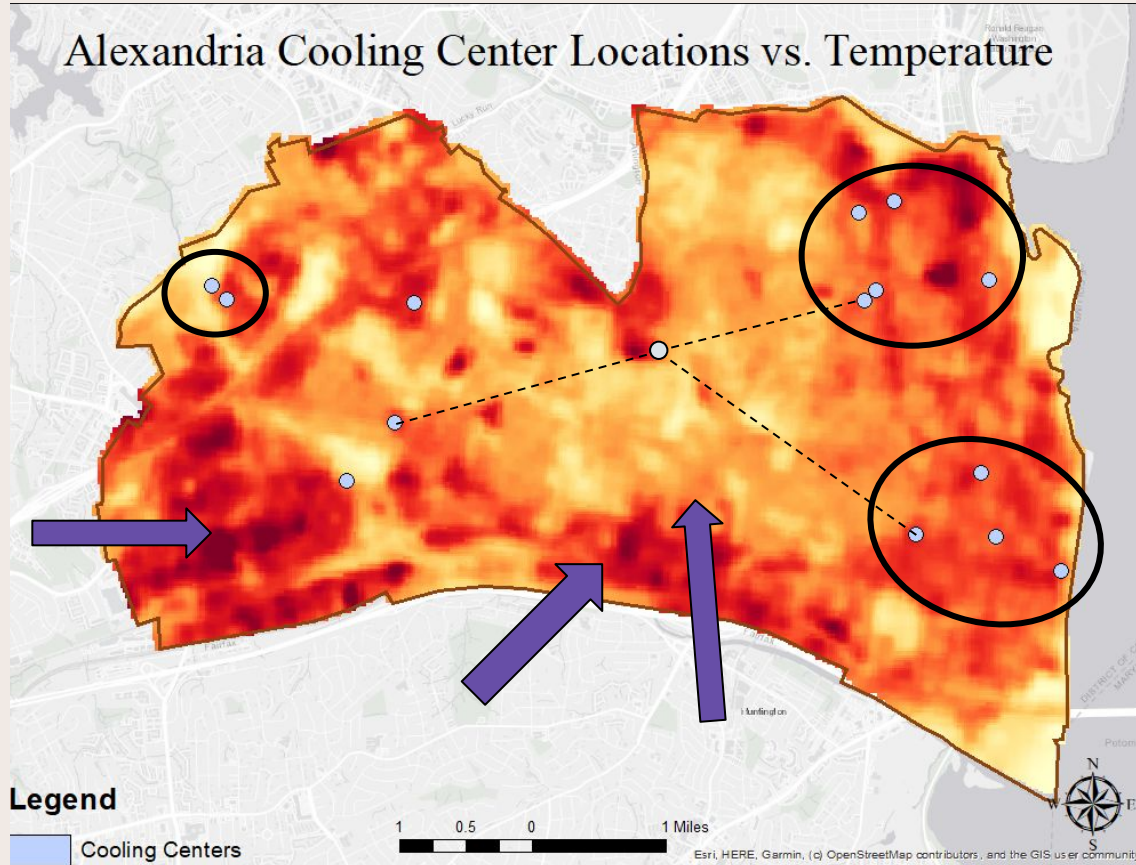


**Urban  
Planning**

**Vegetation**

**Outreach**

# ALEXANDRIA COOLING CENTERS



# COOL SURFACES



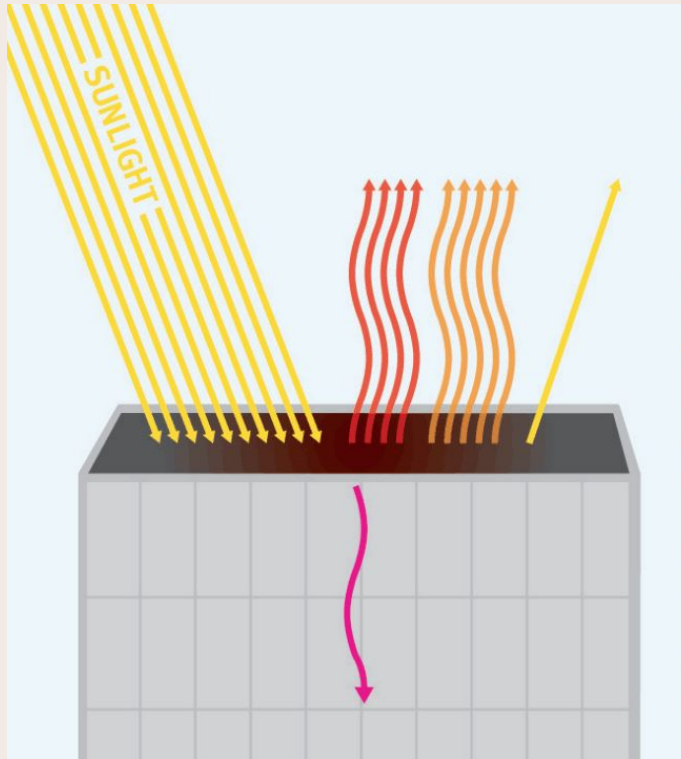
Alexandria should partner with property owners to implement reflective pavements and white rooftops



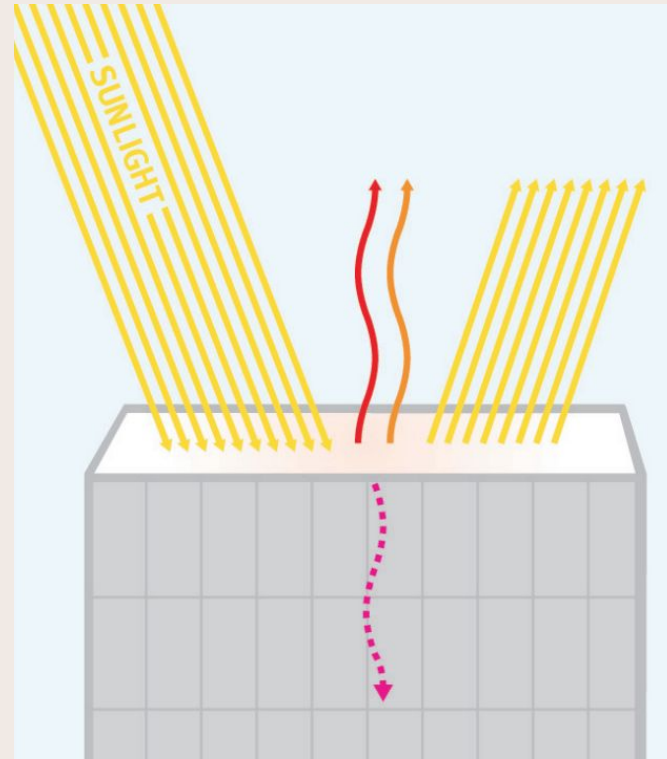


# HOW COOL SURFACES WORK

## Dark Surface



## Light Surface



# COOLING ASSISTANCE

Alexandria should establish a committee and expand outreach



# BE COOL, BE SAFE THIS SUMMER

City of Alexandria Senior Cool Care Program

For eligible seniors who need cooling in their homes.

## GUIDELINES:

- You must be 60 years of age or older
- Must meet income guidelines
- Must be a City of Alexandria resident

\*Other guidelines may apply

Contact the Division of Aging and Adult Services to find out if you are eligible.

Call 703.746.5999 or email  
[DAAS@alexandriava.gov](mailto:DAAS@alexandriava.gov)



Department of Community  
and Human Services

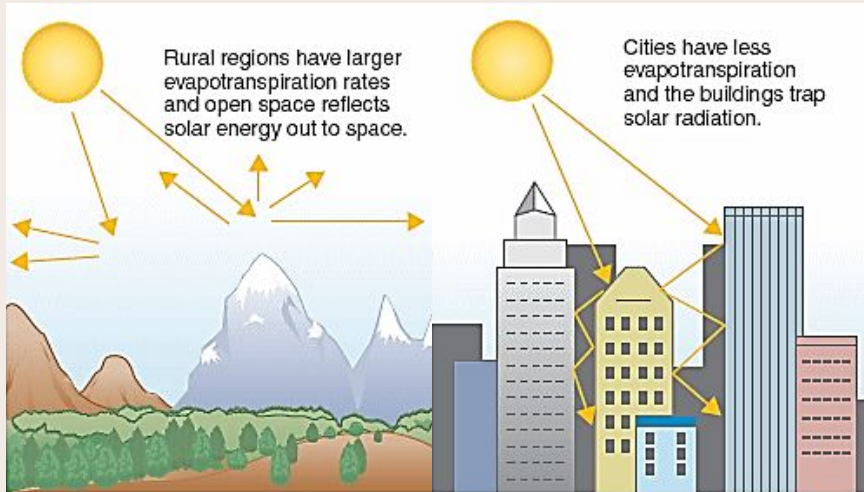
Division of Aging and Adult Services  
Department for Aging and Rehabilitative Services - Office for Aging Services  
[alexandriava.gov/Aging](http://alexandriava.gov/Aging)



# URBAN PLANNING



1. Alternative Materials
2. Emphasis on urban airflow
3. Shade structures



# EXPAND VEGETATION



# ALEXANDRIA CAN IMPROVE OUTREACH



UHIs can cause life-threatening conditions like:

-  Heat Cramps
-  Heat Exhaustion
-  Heat Stroke

## WARNING SIGNS

UHIs can cause life-threatening conditions, seek medical attention for these symptoms:

- |           |                    |
|-----------|--------------------|
| Confusion | High Body Temp     |
| Cramps    | Red/Hot Skin       |
| Fainting  | Dizziness          |
| Headache  | Strong/Rapid Pulse |
| Nausea    | Weakness           |
| Tiredness |                    |

## Resources

The City of Alexandria offers:

**Cooling Centers**  
<https://www.alexandriava.gov/homeless-services/seasonal-and-emergency-warming-and-cooling-options>

**Extended Pool Hours:**  
<https://www.alexandriava.gov/Aquatics>

**Cooling Assistance Program:**  
<https://www.alexandriava.gov/economic-support/program/utility-heating-and-cooling-assistance>

## WHAT ARE URBAN HEAT ISLANDS

Urban Heat Islands (UHIs) are defined by the United States Environmental Protection Agency as "urbanized areas that experience higher temperatures than outlying areas."

This rise in temperature is most often attributed to reduced natural landscapes, increased human activity, and expanded urban planning.

## WHAT CAN YOU DO



Avoid driving in heavy traffic



Use public transportation



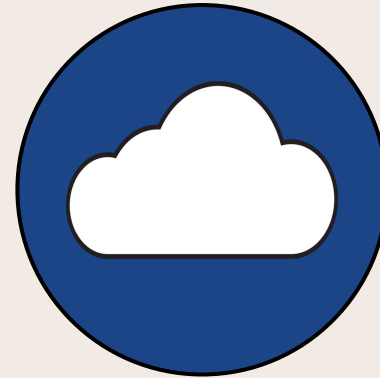
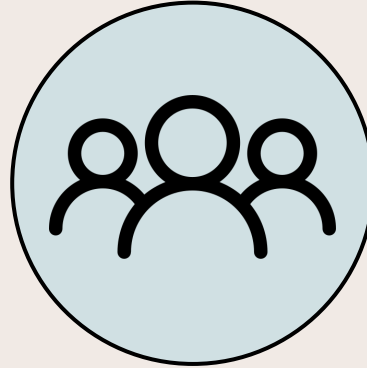
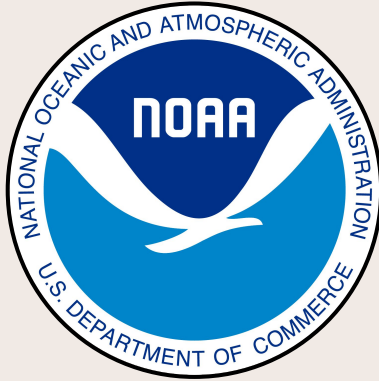
Limit cooling appliances to one room



Limit use of fossil fuels

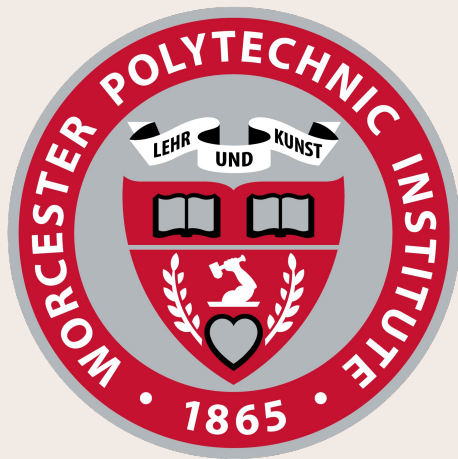


# ADDITIONAL RESEARCH AND PROJECTS



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Interviewees and Community Members	



# THANK YOU

Do you have any questions?  
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