Urban Land Institute

Center for Sustainability and Economic Performance

Heat Resilience and the Built Environment

NASHVILLE, TENNESSEE

A TECHNICAL ASSISTANCE PROJECT FROM THE ULI RESILIENT LAND USE COHORT

JUNE 11, 2021

Welcome from Mayor Cooper

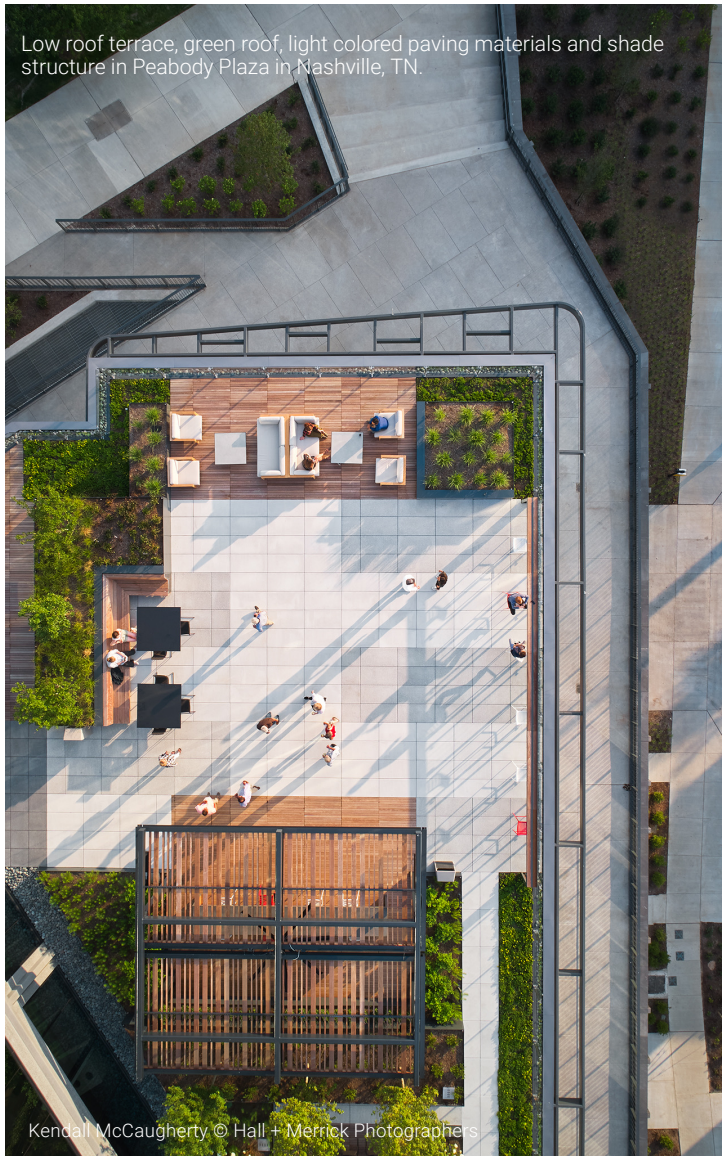
Urban Land Institute

Welcome

Kim Hawkins, ULI Nashville District Council Chair

A very special thank you to the ULI Nashville Member Advisors:

- Mark Deutschmann, Core Development Co.
- Jennifer Horne, Urban Campus and Core
- Katy Sheesley, GHP
- John Vick, Tennessee Department of Health
- Erica Weeks, Hastings Architecture



Low roof terrace, green roof, light colored paving materials and shade structure in Peabody Plaza in Nashville, TN.

Kendall McCaugherty © Hall + Merrick Photographers

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ULI's Urban Resilience Program

- Mission: To shape the future of the built environment for transformative impact in communities worldwide
- ULI is a multi-disciplinary membership organization with more than 45,000 members in private enterprise and public service
- ULI's Urban Resilience program brings member expertise in land use, real estate, and climate resilience to communities nationwide.
- Resilience panels:
  - Provide land use and development strategies for vulnerable sites
  - Assess policy opportunities to enhance community resilience
  - Craft strategies for implementation and funding of resilience projects and programs





Resilient Land Use Cohort (RLUC)

Program Overview

- RLUC is platform for advisory services, technical assistance, and knowledge sharing between 8 cities and their ULI District Councils.
- RLUC leverages ULI member expertise to identify strategies for cities to be more resilient in the face of climate change and other vulnerabilities, as well as the related social, environmental, and economic impacts.
- The project is generously supported by JPMorgan Chase through a grant to the ULI Foundation.

Thank you to our sponsors!

JPMorgan Chase & Co.

GNRC GREATER NASHVILLE REGIONAL COUNCIL

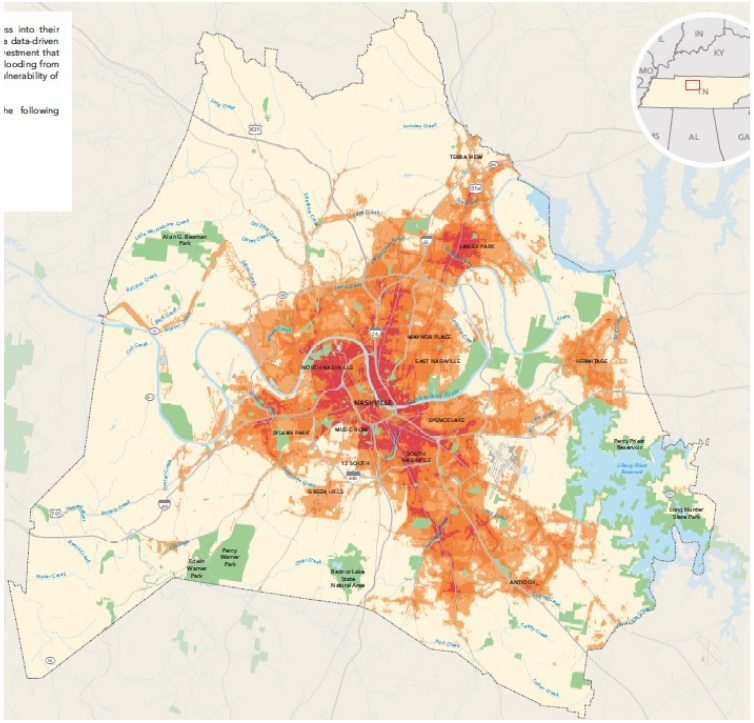
METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

core

Scope of the Panel

- What are the **building and site-scale landscape design heat resilience strategies** that have the potential to help the region achieve its extreme heat/cold resilience goals?
- How can the Nashville region ensure that **building retrofits and land use** heat mitigation actions are done so in an **equitable manner**?
- What are opportunities and challenges for new programs like the voluntary energy benchmarking to achieve its **longer-term heat mitigation and energy efficiency goals**?
- What relevant/current regulations and **potential financing mechanisms** programs can be leveraged to support extreme temperature mitigation retrofits and **create a market for resilient buildings** in the region?
- How could future city policy **encourage local property owners and developers** to mitigate extreme heat/cold at their projects and open spaces?

Nashville's Priorities for Strategic Green Infrastructure Investment



Trust for Public Land Smart Cities, City of Nashville

ULI Panelists

Selected for their subject matter expertise to provide **objective, volunteer** recommendations

Dr. John Vick
Evaluation and Assessment Director
Tennessee Department of Health
ULI TAP Chair

Kevin Augustyn
Vice President
DBRS Morningstar

Clay Haynes
Founder
Public Square

Jillian Burgess
Senior Building Enclosure Consultant
RWDI

Adam Freed
Principal
Bloomberg Associates

Abena Ojetayo
Director of Housing & Community Resilience
City of Tallahassee

Sadhu Johnston
City Manager (Former)
Vancouver, BC

Erica Weeks
Associate Principal & Director of Sustainability
Hastings Architecture

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Graduate Student Intern
ULI Urban Resilience

Kate Hyde
Senior Associate
ULI Nashville

Rose Faeges-Easton
Senior Director
ULI Nashville

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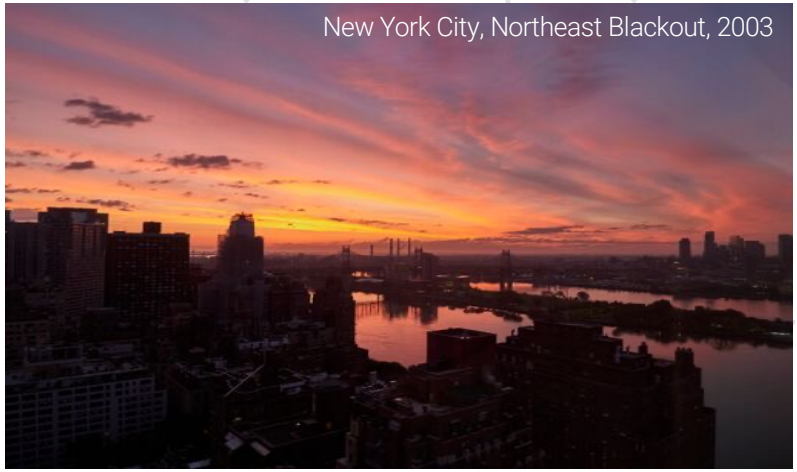
Thank you, Stakeholders!

Michael Vandenberg • Dr. David Padgett • Jacklyn Mothupi • Tim Netsch • James Fraser • David Lawrence • Mary Roskilly • Emily Lamb • Dr. Eva Parker • Cindy Harrison • Mary Beth Ikard • Mark Deutschmann • Jenny Park • Linda Breggin • Kim Hawkins • Kim Shinn • Tim Walker • Todd Lawrence • Patrick King • Shelly Hazle • Bert Matthews • Joe Cain • Greg Claxton • Frank Raply • Edward Henley • Robin Zeigler • Harriett Brooks • Jessica Hill • Fabian Bedne • Kelsey Oesmann • Katie Rudowsky • Brandon England • Doug Sharp • Jonathan Gilligan • Amy Hardin • Curtis Lesh • Brian Nock • Nick Dryden • Manuel Zeitlin

Climate Change and Cities

- 70% of cities are dealing with the effects of climate change (C40 Cities)
- Mitigation: prevent climate change
- Adaptation: prepare for the impacts



The Washington Post
Democracy Dies in Darkness

Despite warnings and planning, Metro shutdown leads to commute meltdown for many

RISING RISKS

Climate change will crush real estate values for investors who don't prepare, new report says

PUBLISHED MON, APR 8 2019 • 12:11 PM EDT | UPDATED TUE, APR 9 2019 • 1:55 PM EDT

Diana Olick
@DIANAOLICK

SHARE

KEY POINTS

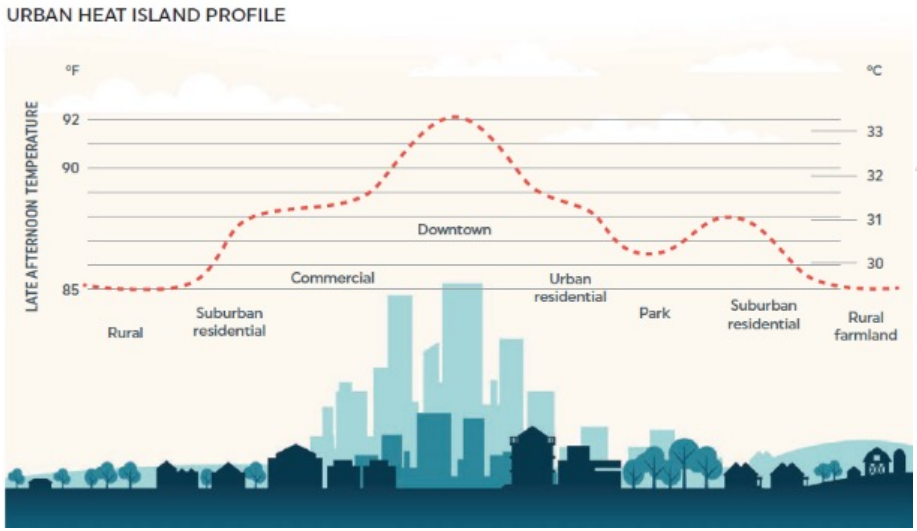
- Big real estate firms are pouring resources into calculating climate risk and its likely effect on property portfolios — everything from increasingly extreme weather to sea-level rise.
- "This process will be painful for investors who are caught off guard, but those who are prepared have the potential to outperform," a new report from the Urban Land Institute says.

https://www.cnbc.com/2019/04/08/climate-change-will-crush-real-estate-values-for-unprepared-investors-report.html

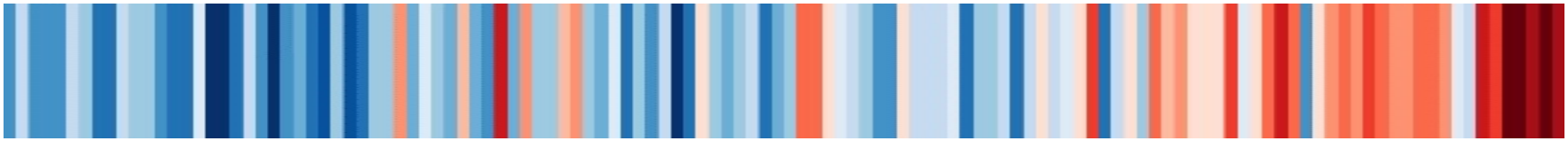
Urban Heat Island Background and Risks

Extreme Heat and the Built Environment

- Widespread public health risk
- Climate resilience connection
- Numerous mitigation opportunities



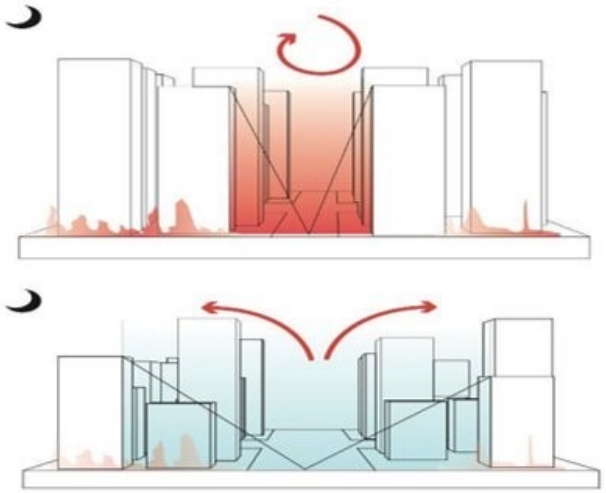
Heat Island Group, LBNL



CA Avg. Annual Temperature, 1895-2018 https://showyourstripes.info/

Primary Solutions to Addressing Urban Heat Island Effect

- Addressing urban heat island effect to scale through an equity lens:
  - Building-level – green roofs, reflective roofs
  - Site-level – reflective pavements, landscaping
  - Neighborhoods – street allocation



ULI

Credit: NYIT Urban Design Climate Lab 2017

EPA

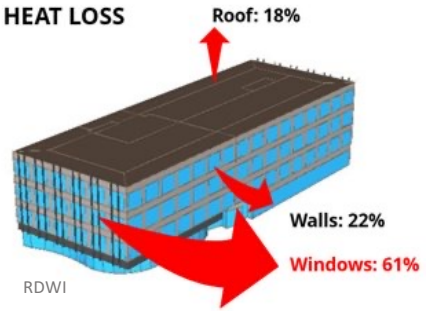
The Chicago City Hall green roof measures almost 80°F (40°C)

New Construction Recommendations

Implemented through building codes and incentive programs

- Require reflective and green roofs
- Encourage passive construction – improved insulation, reflective walls, less glass
- Incentivize efficient heating and cooling systems such as heat pumps
- Include provisions for shading elements

RDWI



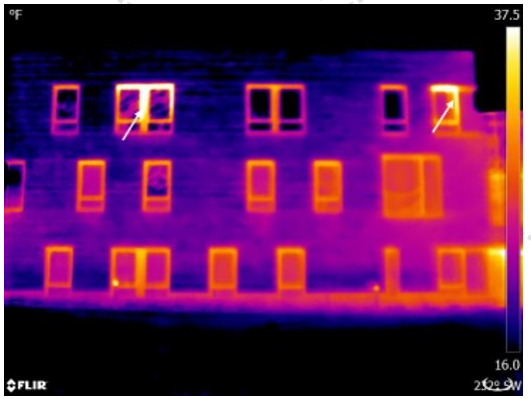
RDWI

RDWI

Existing Building Recommendations

Implemented through building codes and incentive programs

- Install reflective roof coatings
- Increase air tightness and weatherization of building envelopes
- Incentivize high efficiency heating and cooling systems



RDWI

A green roof on Chicago City Hall

New York City

A "cool roof" being installed on an existing building in New York City

Site Recommendations

Implemented through Metro stormwater permit process and zoning design standards

- Ensure required bio-swales and rain gardens are installed and maintained
- Increase permeable area on site and allow roof gardens to contribute as permeable
- Reduce parking minimums
- Require cool pavements
- Parking lot design standards to include green infrastructure
- Performance based landscape standards including the consideration of plant type and irrigation requirements (reduce turf and introduce native species)

Cool Seal product being installed in Los Angeles

A "cool street" in Los Angeles

Adam Freed

Neighborhood Recommendations

Implemented through municipal pilot and incentive programs

- Install spray pads, misters, and other water-cooling devices
- Reallocate road space to support alternative transportation and open space (streets to parks)
- Build complete streets implementing multipurpose green infrastructure
- De-pave existing parking areas
- Inventory public assets to find new green and cool space opportunities
  - E.g., existing schools, libraries, etc.
- Encourage green corridors for connectivity

One of the 240 Schoolyards to Playgrounds completed in New York (City of New York)

Neighborhood Recommendations

A "greenstreet" installation in an underutilized paved area (City of New York)

Tree Canopy Recommendations

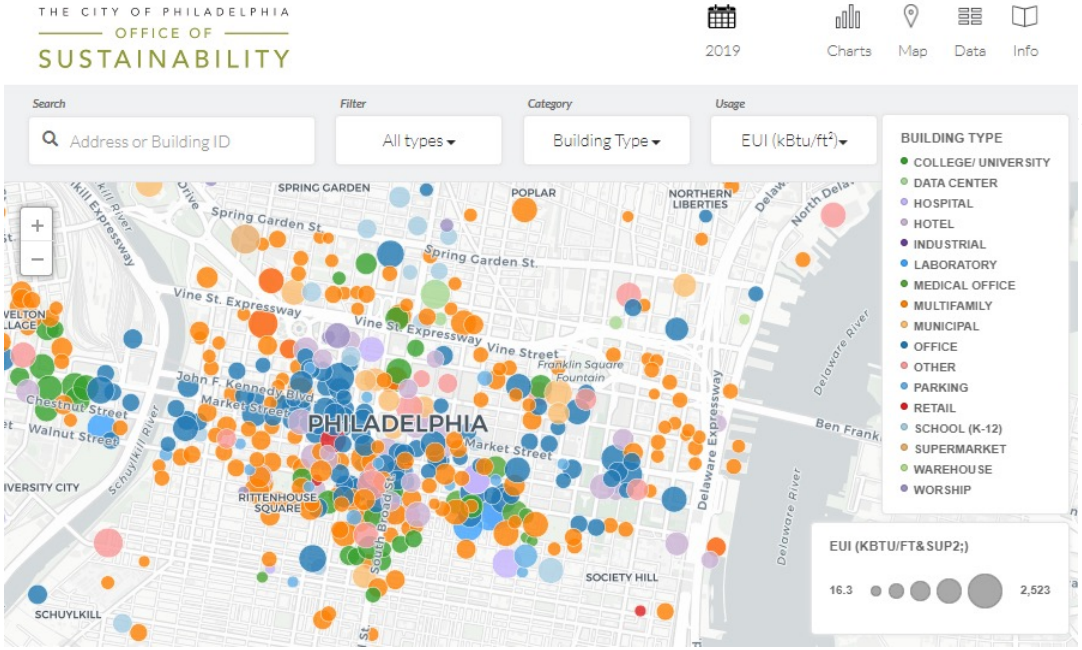
- Plant larger trees as a part of new developments
- Include single family homes and duplexes in the tree ordinance
- Increase penalties for illegal tree removal
- Increase in lieu payments to tree mitigation bank
- Incentivize tree planning above requirements
- Increase tree canopy requirements in all project approvals

Launch of the Root Nashville campaign

Bloomberg Associates

Building Code Recommendations

- Metering and reporting
- Code enforcement
- Third party permit reviews
- Additional review and oversight for larger projects



City of Philadelphia, PA

Health and Equity

Community Empowerment

1. Develop education campaigns to inform developers, non-profits, community members about urban heat issues and solutions.
2. Use citizen science as a teaching tool for community members about heat impact and solutions.
3. Use the Wedgewood Houston Neighborhood development rubric as a model to replicate in other neighborhoods. The rubric can empower residents to shape development in their neighborhood and can incorporate heat mitigation design strategies.

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Wedgewood Houston Proposed Development Rubric

Scoring proposed projects in relation to Wedgewood Houston's community needs and wishes. Projects that meet at least the minimum score of 80 are considered for Wedgewood Houston community/SNAP support (letters, etc.).

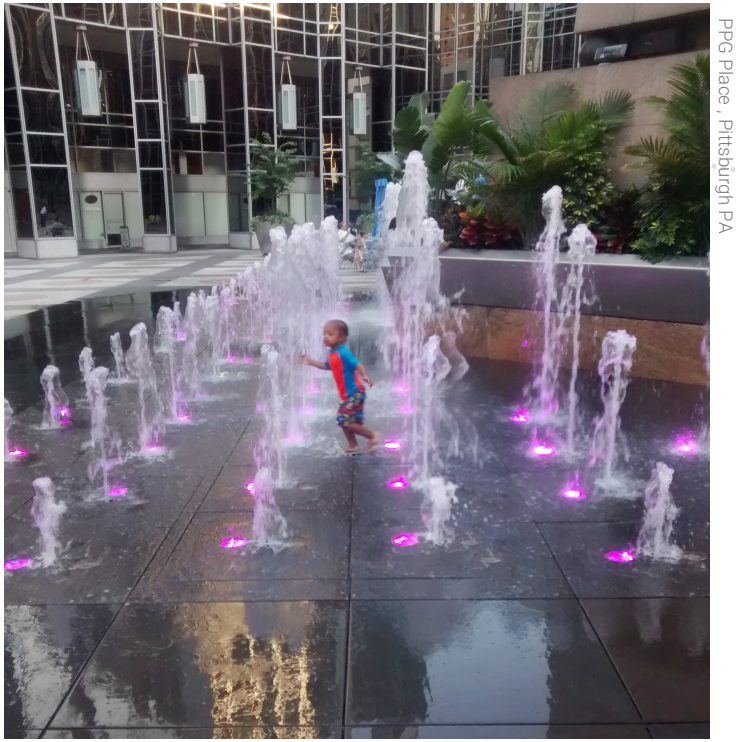
	Strong *20 Points*	**Sufficient** *10 Points*	**Lacking** *0 Points*
Community Character	Design is respectful of community character. Proposed buildings symbolize a reimagining of historical neighborhood structures.	Proposed development includes more units that are vastly different from the character of the neighborhood (i.e.-"tall and skinny"), size of proposed units doesn't fit the scale of the need in community (i.e. micro units in a family-centered neighborhood)	Buildings standout from community character. No focus on maintaining historical character or meeting the community's ideal needs.
Housing Diversity	At least 30% of proposed housing/unit options are diverse housing (i.e.-workforce, mixed use, mixed income, 0-80% AMI affordable, family focused).	Only one type of diverse housing/unit is included in plan, BUT still represents at least 10% of the prosed units within the project.	Less than 10% affordable housing/units, included in the proposed project.
Transportation Consideration	Obvious design for ease of access to, and safety around, public transportation, and neighborhood walkability. Includes crosswalks and/or sidewalks. Pedestrian safety (bus stop lights, bike lanes, school zones, etc.)	Proposed plan minimally addresses pedestrian safety around busy streets, near schools, etc. Vague language surrounding developer's commitment to community/pedestrian/biking/bus rider safety.	No focus on pedestrian needs or public transportation safety, etc.
Sustainability	Includes sustainable design metrics. Focus on mitigating urban runoff. Plan for **ETHER** 10% increase in trees, unique use(s) of green space. Inclusive, welcoming public spaces (focused on needs of legacy and new neighbors). Multiple LEED concepts firmly established.	Meets more than the minimum required open space, storm water, and landscape requirements, as defined in the Metro Nashville Zoning Ordinance. Lacks creativity and plan for inclusive and welcoming public open space. Some LEED concepts established.	Meets **ONLY** the minimum required open space, storm water, and landscape requirements, as defined in the Metro Nashville Zoning Ordinance. Lacks creativity and plan for inclusive and welcoming public open space. No LEED concepts established.
Artist/Industrial	Proposed project focuses on inclusion of affordable maker space(s), entrepreneurial education, STEM, industrial space, art spaces, that are inclusive in design and meant to welcome all neighbors. Includes potential outreach plan, to recruit diverse array of local artists, for onsite installations.	Singular focus on one type of artistic/industrial space. Lacks obvious plan to ensure diversity in either types of projects or artists represented. No recruitment plan to ensure inclusive diversity.	No focus on artistic/industrial space

Note: This rubric is a *living document* and may change to fit the changing needs of the Wedgewood Houston Community.

Health and Equity

Neighborhood Response

1. Establish neighborhood resilience hubs at existing community centers, schools, or libraries. These hubs provide a place for residents to cool off, warm up, and access essential services and resources, including during natural disasters. Hubs can include medical and mental health services, food, water, and emergency medical supplies. Prioritize establishing hubs in neighborhoods with high health risk.
2. Create a community-focused volunteer resilience program to check on residents with high health risk on adverse weather days. Examples: NYC *Be a Buddy* and Paris *Challex*.
3. Add misting stations in parks or other public spaces where high health risk residents spend time.



PPG Place , Pittsburgh PA

Resilience Hubs

Tallahassee, FL

Augmented existing public facilities to better serve neighborhoods before, during, and after a crisis

- Year-round health & social services
- Sustainable & climate responsive design
- Emergency preparedness & response
- Resources to build neighborhood's adaptive capacity

Learn more at http://resilience-hub.org

City of Tallahassee, FL

Health and Equity

Displacement Prevention

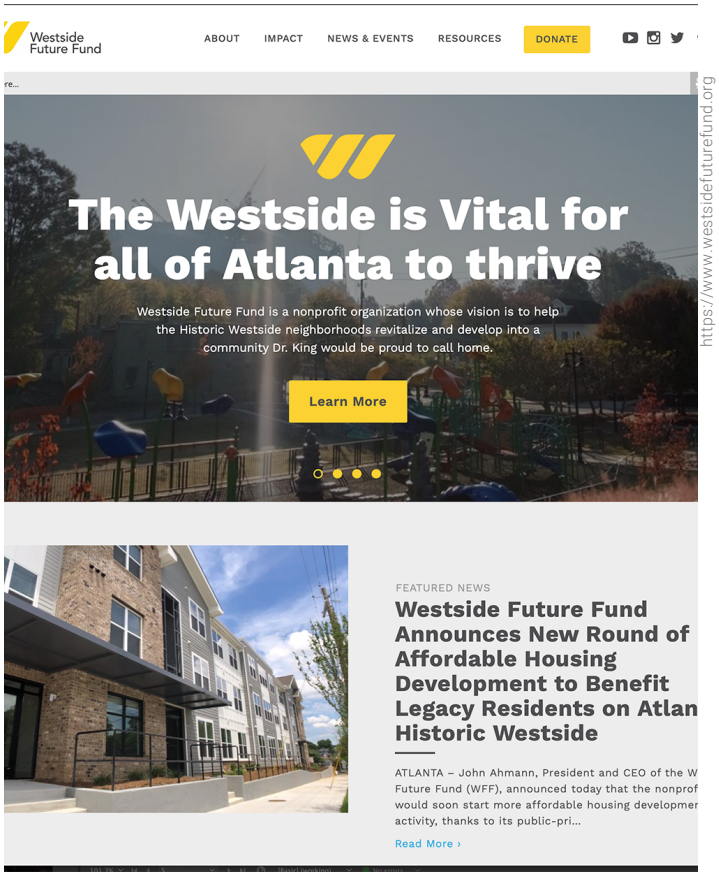
1. Reduce energy expenditures for existing homeowners, particularly seniors, by funding energy efficiency upgrades to lower energy bills and help ensure they can afford to stay in their homes. These could be funded through utility grants or loans subsidized by utility companies for air conditioning and other energy efficiency investments.
2. Provide financial assistance to income-qualified homeowners to prevent increased property values from forcing them to move. Example: Westside Future Fund in Atlanta
3. Acquire land strategically to address heat or flood risks and gaps in park access.

Adobe stock

Adobe stock

Example: Westside Future Fund

Atlanta, GA

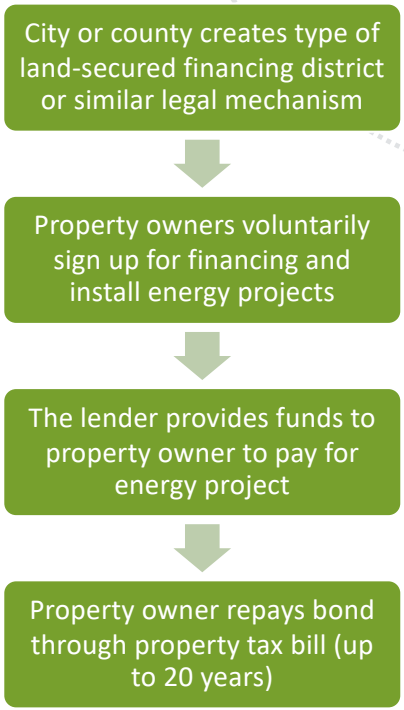


https://www.westsidefuturefund.org

Finance

Financing Strategies

- Develop corporate leadership with sponsored initiatives (with adequate funding) – Amazon, Alliance Bernstein, Facebook, Oracle, Nissan – that focus on capacity building for affordable housing, open space, and climate issues
- Encourage Cities and Counties in the region to adopt Commercial Property Clean Energy ordinance(s) (C-Pace) that utilizes and enhances state enabling legislation
- Create financing resource hub for developers and municipalities that utilize the federal programs including HUD 108, CDBG/HOME, LIHEAP, HTC, NMTC, TIF and others
- Allocation of Cares Act and American Rescue Plan funds to fund resiliency of Public Buildings



Development

Development Strategies

- Use of entitlements and or density bonuses to incentivize cool roofs / green roofs, tree canopy, cool coatings and improvements to the building envelope
- Address the code exemptions for single family homes to cool roofs and tree canopy
- Encourage developers to contribute to a community amenity fund that can fund greater community resilience
- Greater education and case studies that demonstrates resilience as a value criteria

Green roof at Capital View

Short-Term Recommendations

Building or Site	Remove barriers to green infrastructure by changing the definition of green roofs as permeable.	Update building codes to require reflective roofs in new construction and significant building upgrades	Conduct a pilot program to retrofit existing roofs with reflective roofing including schools and affordable housing.
Neighborhood	Conduct a pilot program to test water cooling devices like spray pads, misters and cool pavements.	Use citizen science as a teaching tool for community members about heat impact and solutions.	Create a community-focused volunteer resilience program to check on residents with high health risk on adverse weather days.
City and Regional	Address code enforcement to ensure green infrastructure components are built and building energy codes are met or exceeded.	Require third-party reviews of permit sets for energy code compliance.	Add misting stations in parks or other public spaces where high health risk residents spend time.
Finance / Development	Tap into private corporate leadership and financial resources to address broad community initiative.	Facilitate the full use of economic development incentives to fund resilient and sustainable real estate development with positive community impact.	Establish regulations and entitlement criteria that direct developer community contributions in line with requirements in other markets.


Q&A
THANK YOU
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