National Capital Region Transportation Planning Board

Regional Extreme Heat Analysis

Regional Public Transportation Subcommittee Meeting

February 24, 2026

Agenda

Overview of Regional Extreme Heat Analysis

Project Updates and Discussion:

1. *Preliminary Results for the Transit Impact Analysis*
2. *Summary of Grant Database for Extreme Heat*
3. *Focus for Best Practice Design Guidance*
4. *Focus for Model Policy Language*

Next Steps

Project Objectives

The TRIP identified the need for deeper dives into extreme heat impacts and resources. **The Regional Extreme Heat Analysis will:**

OBJECTIVE 1

Identify **where** transportation assets and systems in the region may experience the worst impacts of extreme heat.

OBJECTIVE 2

Demonstrate **how** this could impact the local economy and the ability of the region to meet its broader goals.

OBJECTIVE 3

Provide **resources** to help member agencies kick-start their efforts to adapt to these risks.

Project Updates and Discussion

Overview of Products

ITEM A – Transit Infrastructure Resilience Analysis

ITEM B – Grant Application Support

ITEM C – Best Practice Design Guidance

ITEM D – Model Policy Language

ITEM A – Transit Infrastructure Resilience Analysis

Assess the past, projected, and downstream impacts of extreme heat on rail and bus operations and ridership, to inform future resilience efforts.

Deliverable: Memo on historic and projected heat impacts to rail and bus operations and ridership, including:

- **A retrospective analysis** using historical high heat days and transit ridership data to understand how heat thresholds may impact ridership
- **A future analysis** using climate projections to anticipate high heat trends and the potential future impacts on ridership
- **A qualitative impacts analysis** of downstream consequences

ITEM A – Preliminary Results

Assess the past, projected, and downstream impacts of extreme heat on rail and bus operations and ridership, to inform future resilience efforts.

1 Identify case studies

June 20-23, 2024:
- 3 days > 95F, heat emergency activated
- Record-breaking temperatures, hottest since Aug 2016
- Climatologically abnormal for time of year

July 13-17, 2024:
- Daily highs of 95 to 103F, high nighttime lows
- Excessive heat warning
- Record-breaking high temperatures

June 23-26, 2025:
- 4 days > 95F, heat index > 105F
- Climatologically abnormal for time of year

ITEM A – Preliminary Results

Assess the past, projected, and downstream impacts of extreme heat on rail and bus operations and ridership, to inform future resilience efforts.

1. Identify case studies
2. Determine impact to ridership

June 20-23, 2024:
- Baseline daily ridership: 334k
- High heat daily ridership: 308k
- Percent difference: **8%**

July 13-17, 2024:
- Baseline daily ridership: 336k
- High heat daily ridership: 329k
- Percent difference: **2%**

June 23-26, 2025:
- Baseline daily ridership: 506k
- High heat daily ridership: 504k
- Percent difference: **0.4%**

ITEM A – Preliminary Results

Assess the past, projected, and downstream impacts of extreme heat on rail and bus operations and ridership, to inform future resilience efforts.

1. Identify case studies
2. Determine impact to ridership
3. Determine fare revenue lost

June 20-23, 2024:
- Daily fare revenue lost: **$117k**

July 13-17, 2024:
- Daily fare revenue lost: **$31k**

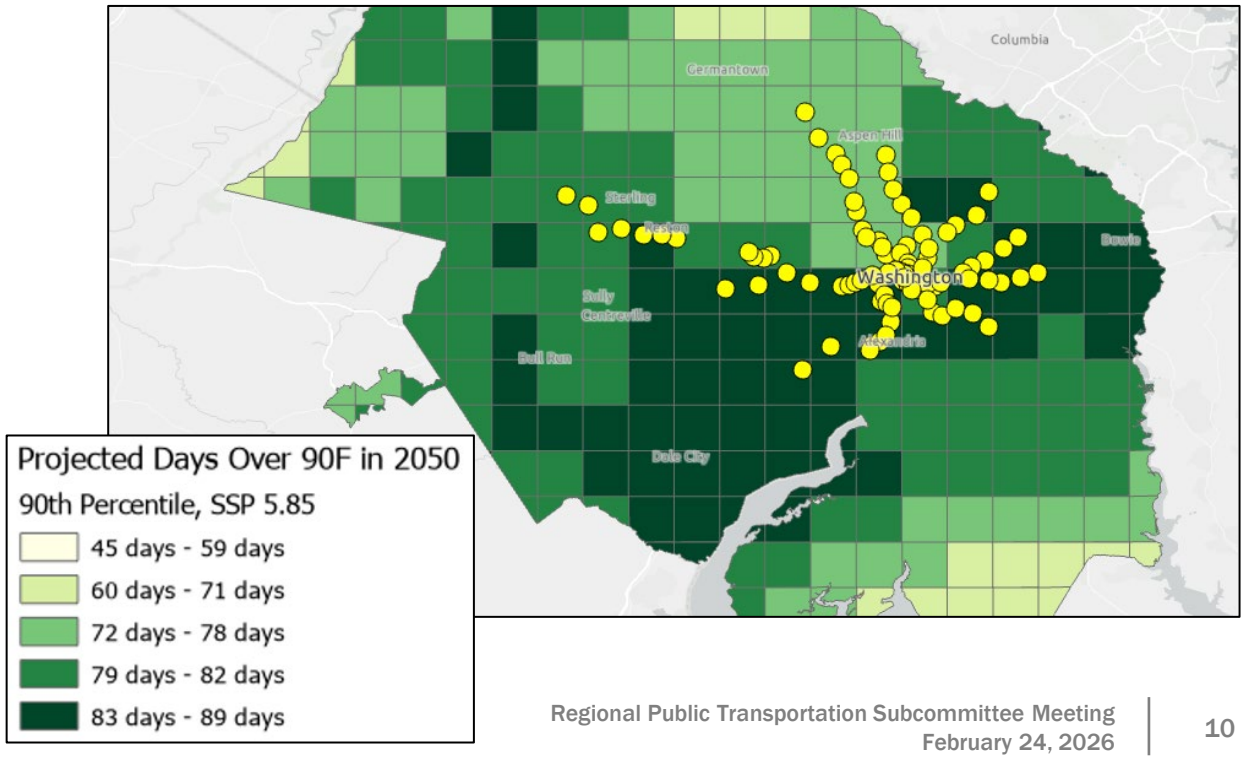
June 23-26, 2025:
- Daily fare revenue lost: **$9k**

ITEM A – Preliminary Results

Assess the past, projected, and downstream impacts of extreme heat on rail and bus operations and ridership, to inform future resilience efforts.

1. Identify case studies
2. Determine impact to ridership
3. Determine fare revenue lost
4. Project future loss

- **2030** → 65 high heat days / year → **$3.3M lost revenue**
- **2050** → 87 high heat days / year → **$4.5M lost revenue**



ITEM B – Grant Application Support

Grant matrix to help agencies identify and develop strong applications for funding opportunities.

Deliverable: Matrix of funding programs applicable for extreme heat projects, including:

- Critical deadlines, evaluation criteria, applicant requirements, project requirements
- Win themes for each funding source to support a strong application

ITEM B – Grant Matrix Summary

Details Include:

- **General Program Information**
- **Applicable Natural Hazards**
- **Eligibility**
  - Applicable State
  - Agency Type
  - Asset Type
  - Cost Share
  - Eligible Activities
- **Applicant Resources**
  - Evaluation Criteria
  - Past Awards
  - Win Themes

General Program Information

Funding Type	Funding Agency	Program Overview	Max Award Amount	Submission Deadlines	Funding Cycle Frequenc	Contact Information
Federal	Federal Emergency Management	HMGP provides post-disaster funding for mitigation projects that	The HMGP program does not have a maximum award amount.	Dependent upon disaster declarations and varies by state.	Dependent on disaster declarations by FEMA. Typically annually.	Vermecia Alsop, DC Haz Mitigation Officer: vermecia.alsop@dc.gov
Federal	Federal Railroad Administration	The FSP Grant Program supports planning and capital projects that	Not specified.	The 2024-2025 opportunity for projects outside of the Northeast Corridor is due on	2023 was first and last program year.	Sergio Coronado: Sergio.Coronado@dot.g Remi Work:

Applicable Natural Hazards

Extreme Heat	Temporary Floo	Permanent Flo	Extreme Winte	Extreme Wind
☑	☑	☑	☑	☑
☑	☑	☑	☑	☑
☑	☑	☑	☑	☑

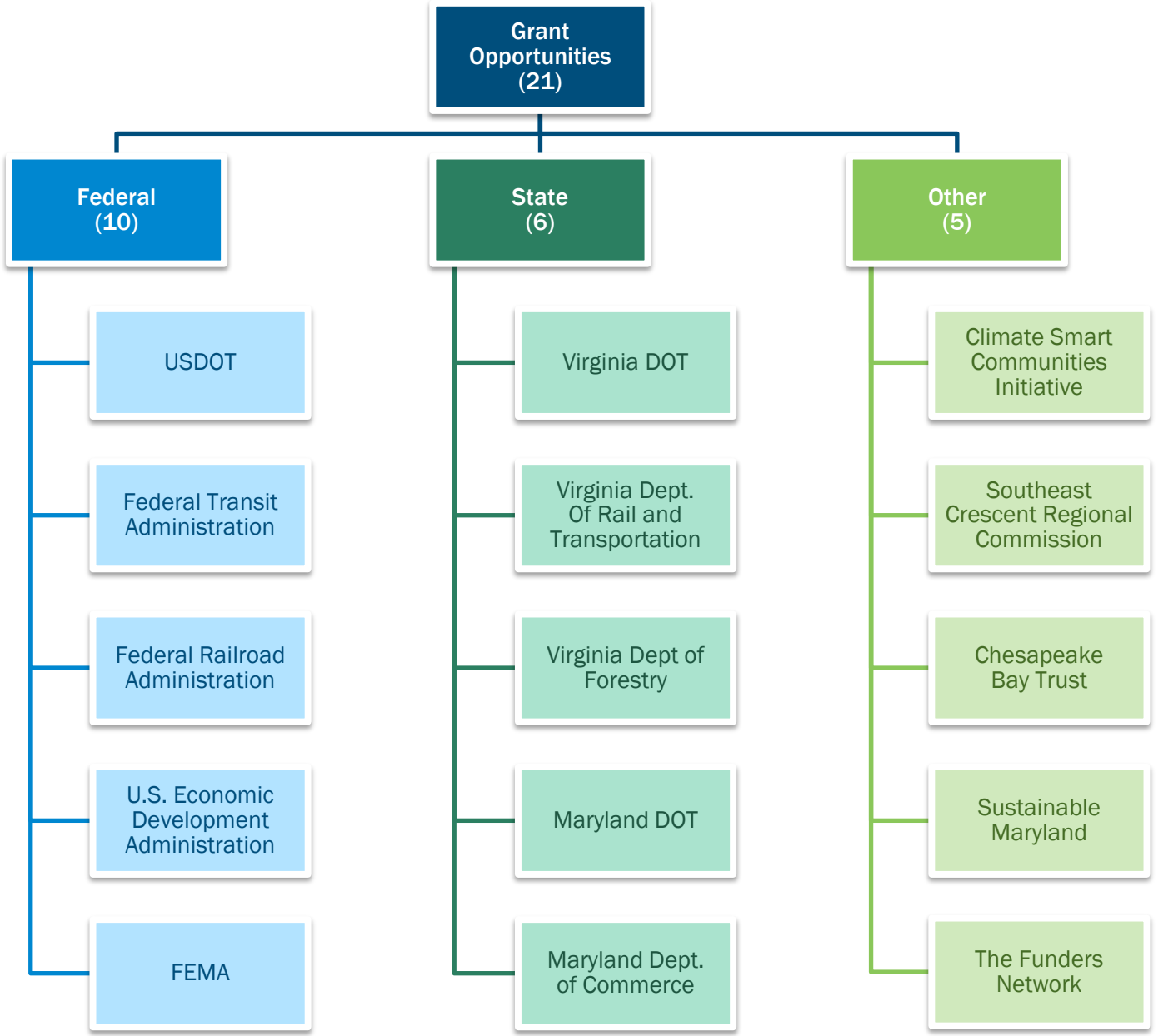
Applicant Resources

teria	Past Awards	Win Theme
n evaluation criteria are the State/Territory Grantee unt for alignment with state	Not publicly available	Applications should ad climate hazard vulnera regional hazard mitigat
n review and selection sts of an eligibility review, iew, steering committee	For FY 2022 - 2023, 25 projects in the northeast corridor were awarded over $16.4 billion, and 10 projects outside of	Applications should inc railroad data and quali accessibility improven
re evaluated on seven	All past award recipients are posted on	Applications should ad

Eligibility

Agency Type				Asset Type								
MPO	Transit Aut	City or Cou	Agency De	Roads	Bridges	Culverts	Rail	Bus	Transit Sto	Green Infra	Asset Deta	Cost
☑	☐	☑	Eligible states, territories,	☑	☑	☑	☑	☑	☑	☑	There are no specified restrictions	Yes
☑	☑	☑	Eligible agencies include states	☐	☐	☐	☑	☐	☑	☐	Funding may only be used for	Yes
☑	☐	☑	CSCI grants require a team of three	☑	☑	☑	☑	☑	☑	☑	There are no specified restrictions	No

ITEM B – Grant Matrix Summary



ITEM C – Best Practice Design Guidance

Best practices and design guidelines for cooling solutions, with region-specific examples.

Deliverable: A best practices and draft design guidelines framework that includes:

- Examination of three prototypical areas (generalized high-heat areas) with four cooling interventions for each area
- Three-dimensional simple block diagrams to depict the prototypical scenarios, with indicated application thresholds
- Implementation thresholds, region-specific design considerations and backing references for each cooling element

ITEM C – Progress to Date

1

Best Practices and Case Studies

- Academic literature review
- Survey of similar planning efforts
- Living summary matrix to pull from across the project process

2

Prototypical Area and Elements Definition

1) Streetscape
   - Trees
   - Groundcover
   - Paving
   - Benches
2) Bus Station Area
   - Trees
   - Groundcover
   - Vertical Shade Structures
   - Waiting Area/Benches
3) TBD – Active Transportation Focus

3

Document Format Development

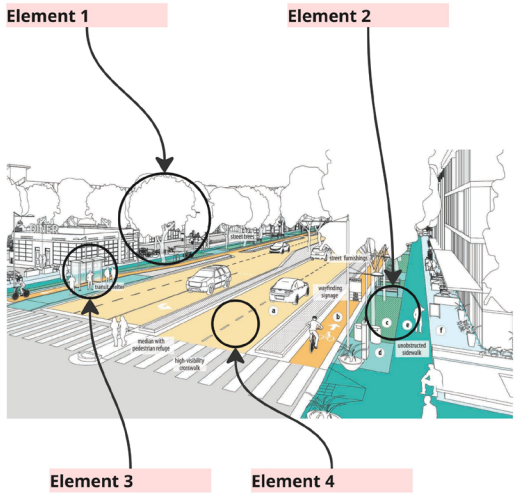
- Spread layout
- Organizational progression and hierarchy

ITEM C – Draft Document Layout

Streetscape

Heat Issues Within the Prototype

Heat Issues Within the Prototype



Streetscape

Brief Narrative

General transect pattern

Representative local example

Street Trees	X	X	X
Blue-Green Infrastructure		X	X
Element C	X	X	X
Element D	X	X	
Element E	X	X	
Element F	X	X	X

Element 1
- A
- B
- C

Element 2
- A
- B
- C

Element 3
- A
- B
- C

Element 4
- A
- B
- C

ITEM C – Draft Document Layout

Street Trees

Introduction
- What the element is and why it is recommended
- Any qualifications on the element the reader may need
- How the element fits into the toolkit

Impact
- How the element mitigates extreme heat
- Inclusion of found research

Considerations
- General design principles
- Other important implementation tips
- Rough cost range

Correlation between urban tree canopy distribution and cooling effect

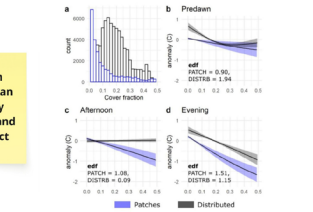
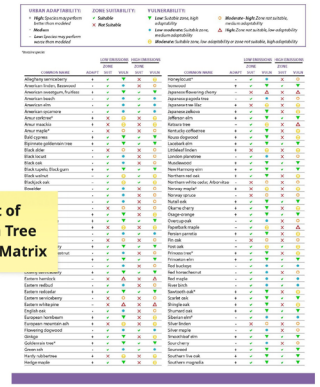


Figure 3. Disentangling the effect of soft canopy fractions on anomaly temperature into large patches (PATCH) with core and distributed soft canopy (DISTRB) with no core. Note that x-axis only goes to 0.5 fractional cover to account for common conditions in Washington, DC.

District of Columbia Tree Resilience Matrix



ITEM D – Model Policy Language

Policy language that jurisdictions can incorporate into design guidelines, standards, and RFPs to promote the use of cooling strategies.

Deliverable: Model policy language for 3-6 types of use cases (e.g., zoning and land use policies, transit station/stop design guidance, contracting/clause language from RFP solicitations).

What specific guidelines, standards, or policies do you have for your jurisdiction that you would be interested in having provided text for?

Using the Microsoft Form, please share links to these or email them to krainone@mwcog.org if not available online.

Next Steps

- **Spring subcommittee meeting:** More progress and results to share!
- **June:** All final products complete

Next Steps

Questions?