

# Potential Urban Heat Island Mitigation Projects

## Woodbridge Township, Middlesex County



A Systematic Approach to Mitigate Isolated Land Surface Temperatures



**Prepared by:**

Prepared by:  
Woodbridge Township  
Green Infrastructure Team  
Woodbridge, New Jersey 07095

*"Ten Towns, One Community"*



# Executive Summary

## Introduction:

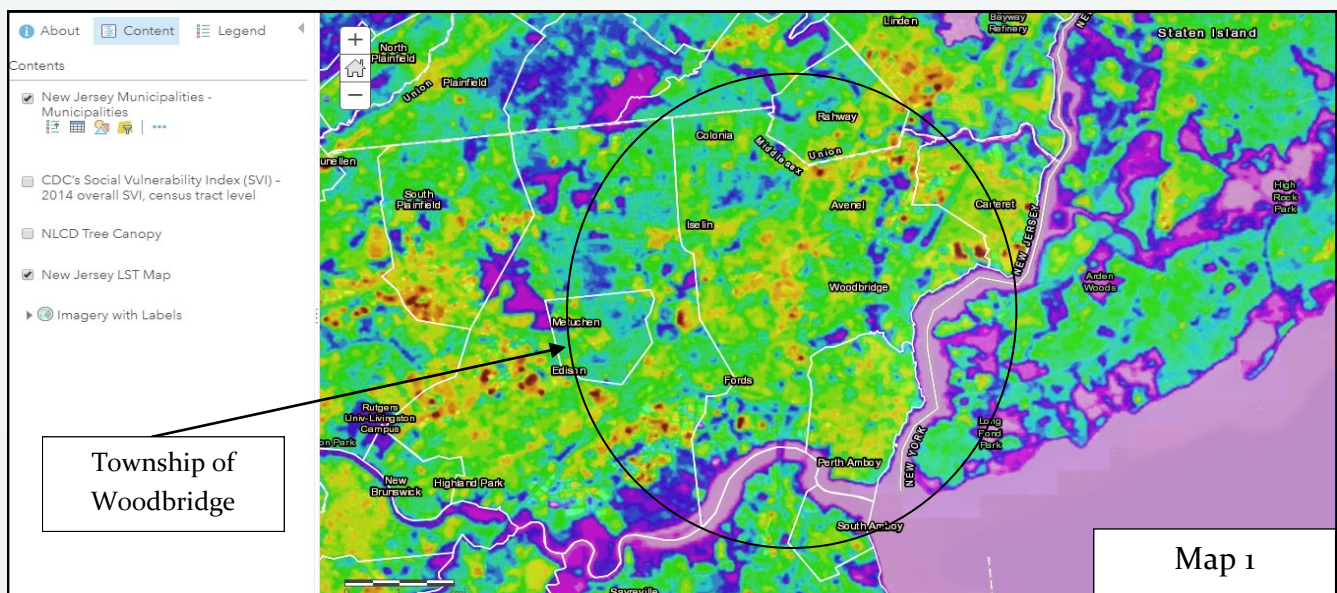
Urban heat Island effects cause serve, environmental and human health concerns. Furthermore, threats continue to intensify as greenhouse gas emissions and previous modifications made to terrestrial environments. But in Woodbridge Township, dedication to ensure mitigation measures are planned and action is taken to combat such issues embody the backbone of the Township's sustainability initiatives. The newly designed and engineered means by which to contest such disturbances caused by waste heat. This endeavor exemplifies that in Woodbridge we adapt, design, and rebuild with resiliency and community health in mind.

## Municipal Background:

Spread across twenty-four square miles with varying densities and land uses, Woodbridge is a mature suburb in need of linking amenities, neighborhoods, and commercial industry with one another through a diverse means. Woodbridge Township is the State of New Jersey's sixth largest municipality and has one of the largest populations (99,585 – 2010 US Census) in New Jersey. The Township is as diverse in its people as it is in its geography. As a result, it's imperative that substantive actions be taken to explore, evaluate, and implement measures to mitigate the negative causes and impacts linked to extreme isolated temperature rises. Current Township operational standards abide by technical planning and engineering examinations which outline site plan criteria for new development. Said principles create a means by which developers, the Township, and the community fulfill environmental function, pleasing aesthetics, and site utility. The sites denoted below contain elements of dated site plan measures which have then since been replaced with modernized approaches to site improvement.

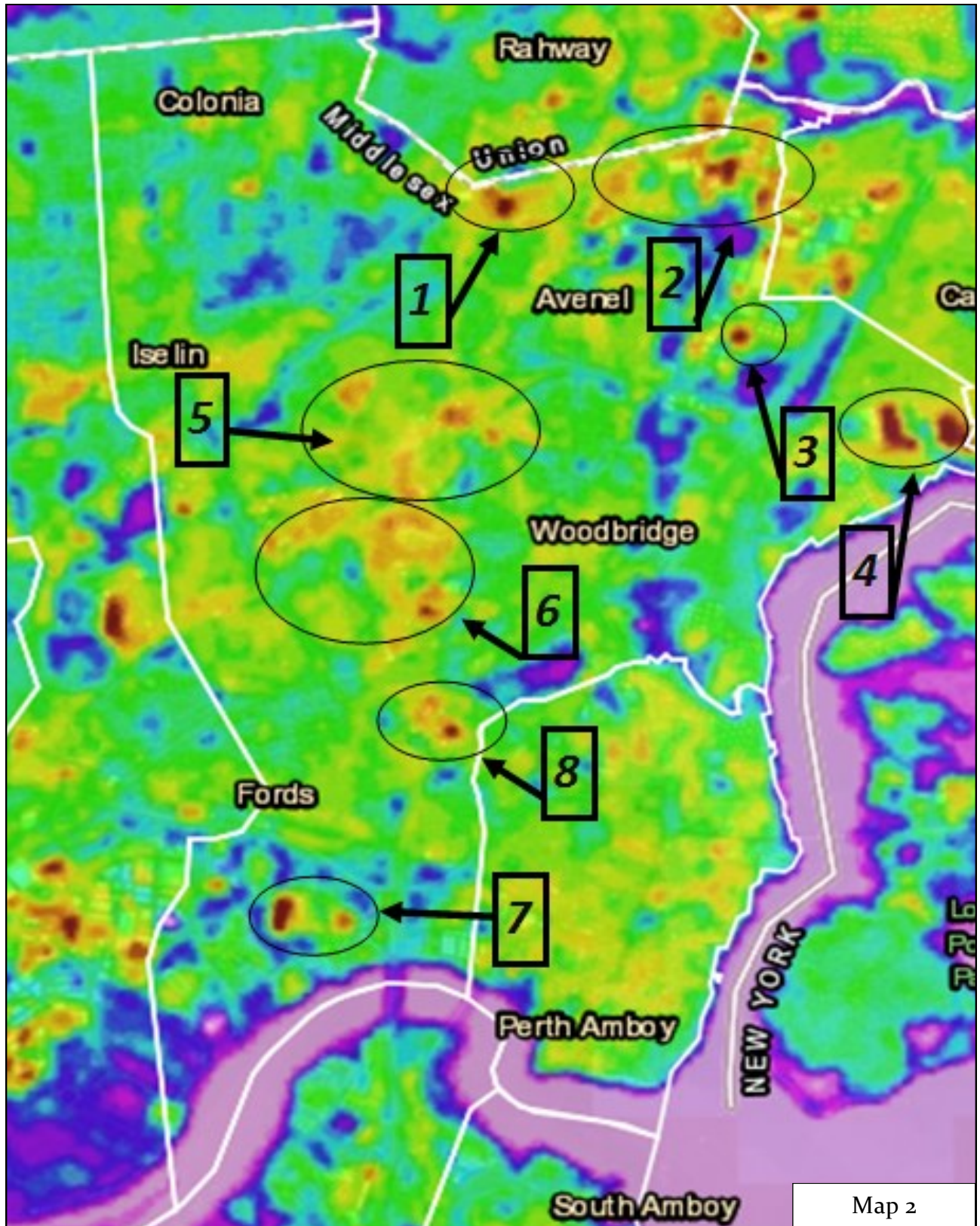


*Urban Heat Island Effects as denoted on map two (2). The areas of concern (AOC's) enumerated below encompass specific characteristics associated with exacerbating factors which are directly correlated to a rise in surface temperature.*

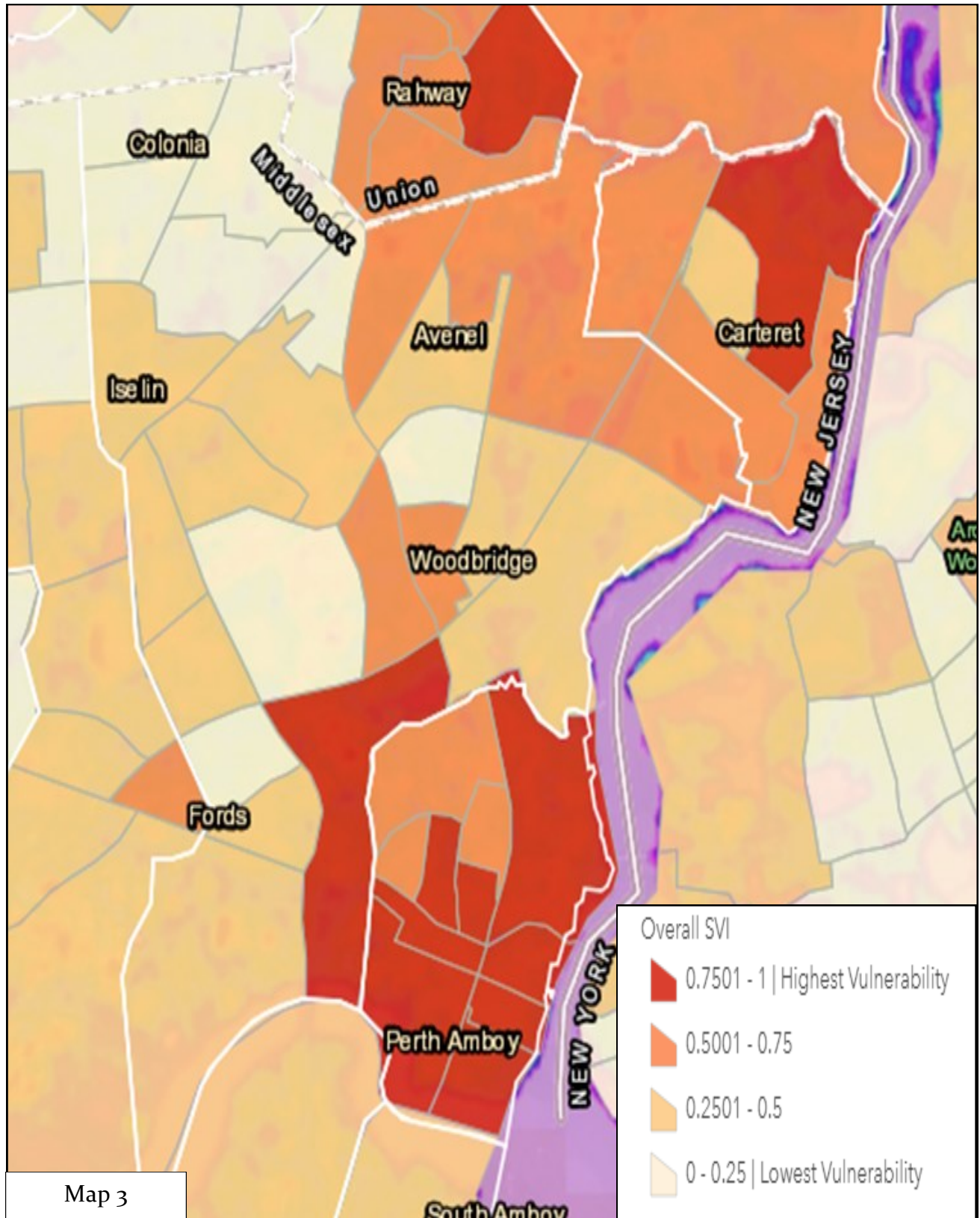




*Township of Woodbridge ~ Urban Heat Island Effects (AOC's)*

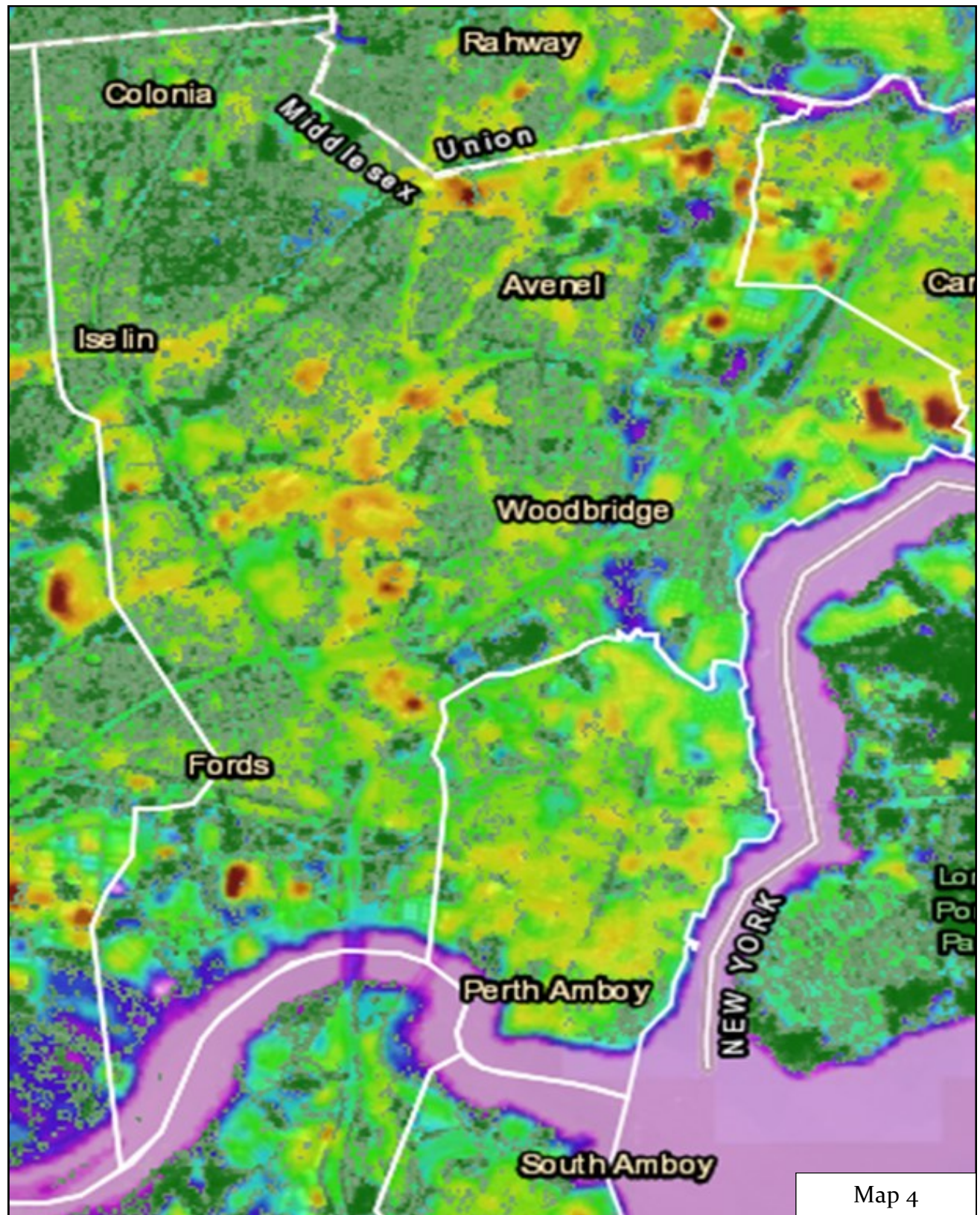


## *Township of Woodbridge ~ Social Vulnerability Effects*





*Township of Woodbridge ~ Tree Cover with LST Overlay*



## TOWNSHIP OF WOODBRIDGE

### URBAN HEAT ISLAND ENVIRONMENTAL REVIEW PROCESS

#### SUMMARY OF EXISTING CONCERN AREAS

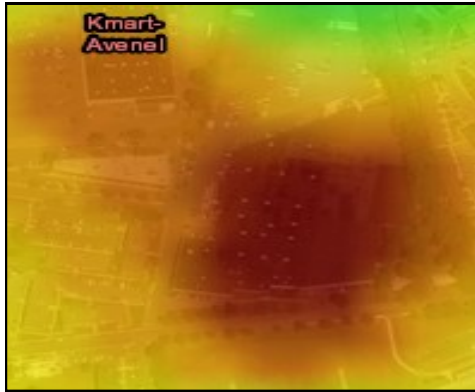
##### Area of Concern One (1) ~ Social Vulnerability 50%-75%

Community: Avenel, Woodbridge Township

Approximate Geographic Location: 40.590740, -74.287743

Type: Retail establishments located in an outdoor shopping complex.

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

- ⇒ Dark roofs
- ⇒ Parking lots
- ⇒ Tree cover—landscaped, and buffered suburban stream corridors

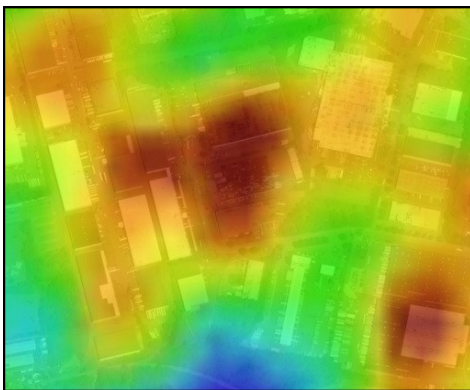
##### Area of Concern Two (2) ~ Social Vulnerability 50%-75%

Community: Avenel, Woodbridge Township

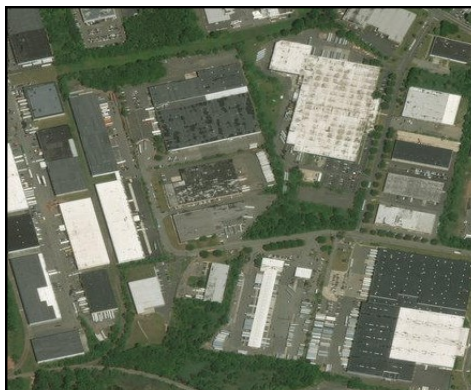
Approximate Geographic Location: 40.593012, -74.256776

Type: Commercial business complex

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

- ⇒ Dark roofs
- ⇒ Parking lots
- ⇒ Tree cover—landscaped, but site adjacent to 100 acre wildlife preserve.



## TOWNSHIP OF WOODBRIDGE

### URBAN HEAT ISLAND ENVIRONMENTAL REVIEW PROCESS

#### SUMMARY OF EXISTING CONCERN AREAS (CONTINUED)

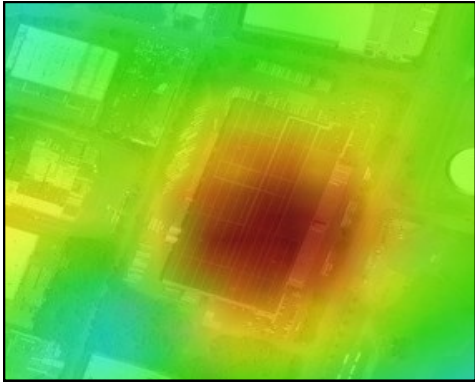
##### Area of Concern Three (3) ~ Social Vulnerability 50%-75%

Community: Avenel, Woodbridge Township

Approximate Geographic Location: 40.575325, -74.258112

Type: Commercial businesses establishments

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

⇒ Dark roof,, however, over 75% of the roof 's surface is lined with solar arrays

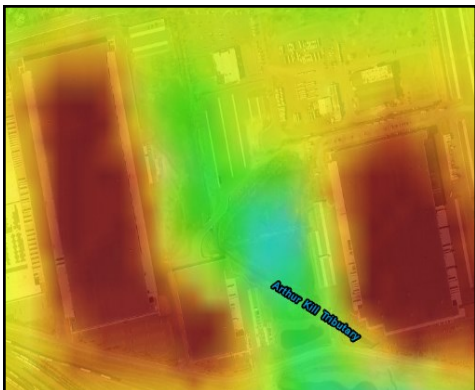
##### Area of Concern Four (4) ~ Social Vulnerability 50%-75%

Community: Port Reading, Woodbridge Township

Approximate Geographic Location: 40.565288, -74.239777

Type: Industrial businesses

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

⇒ Dark roofs

⇒ Parking lots

## TOWNSHIP OF WOODBRIDGE

### URBAN HEAT ISLAND ENVIRONMENTAL REVIEW PROCESS

#### SUMMARY OF EXISTING CONCERN AREAS (CONTINUED)

##### Area of Concern Five (5)~ Social Vulnerability 0 - 25%

Community: Woodbridge Proper, Woodbridge Township

Approximate Geographic Location: 40.556659, -74.299387

Type: Commercial businesses, apartment complexes, and retail establishments located in outdoor shopping complex.

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

- ⇒ Parking lots, however, canopy solar arrays have recently been installed in parking area.
- ⇒ Tree cover

##### Area of Concern Six (6) ~ Social Vulnerability 0 - 25%

Community: Woodbridge, Woodbridge Township

Approximate Geographic Location: 40.548557, -74.295803

Type: Retail establishments located in outdoor shopping complex

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

- ⇒ Dark roofs
- ⇒ Parking lots
- ⇒ Tree cover



## TOWNSHIP OF WOODBRIDGE

### URBAN HEAT ISLAND ENVIRONMENTAL REVIEW PROCESS

#### SUMMARY OF EXISTING CONCERN AREAS (CONTINUED)

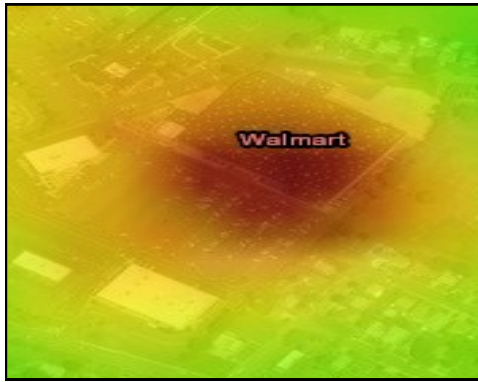
##### Area of Concern One (7) ~ Social Vulnerability 75% - 100%

Community: Avenel, Woodbridge Township

Approximate Geographic Location: 40.519241, -74.312081

Type: Commercial businesses retail establishments located in the outdoor shopping complex.

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

- ⇒ Dark roof
- ⇒ Parking lot
- ⇒ Tree cover

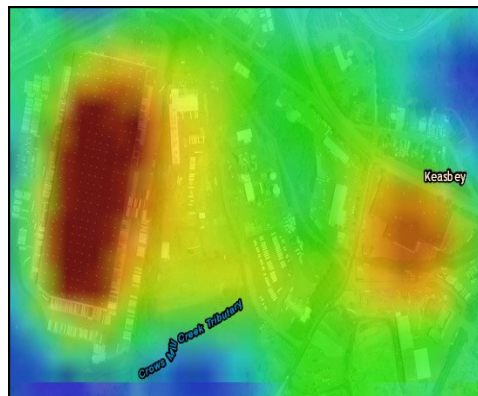
##### Area of Concern One (8) ~ Social Vulnerability 25% - 50%

Community: Fords, Woodbridge Township

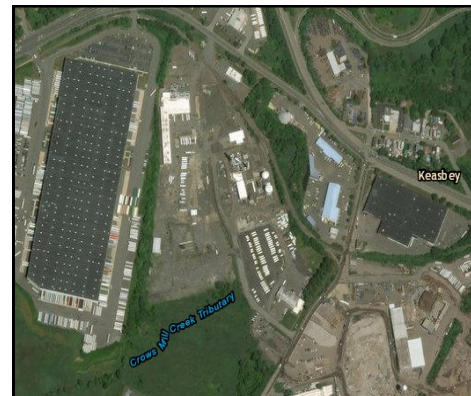
Approximate Geographic Location: 40.535157, -74.294232

Type: Retail establishments located in outdoor shopping complex.

##### Site Conditions:



Land Surface Temperature overlay –ON



Land Surface Temperature overlay –OFF

##### Profiled Dark Spots:

- ⇒ Dark roof
- ⇒ Parking lot
- ⇒ Parcel tree cover

## ***Recommendations / Action Items / Monitoring***

### **Recommendations:**

Potential mitigation techniques would seek to address tree cover enhancement and street-scaping using green infrastructure practices in Township right-of-ways. Site visits confirm said ascertains, as the development of many parcels noted above supersede the existing parameters associated with low impact development recommendations which occur during the Township's review of proposed development.

In addition, project considerations should also take into account improved viewsapes and socioeconomic factors that might lead to an increase in community enhancement areas. These circumstances lend to the consideration of implementing techniques that incorporate tree planting, native landscaping recommendations to business owners, rain gardens, tree canopy cover improvements within the Township's right-of-way.

### **Action Items:**

1. Plan and/or construct LST mitigation project(s) that will serve as a draw and attract sustainable development. Elements of the project will be designed to compliment redevelopment efforts in the Township of Woodbridge within known LST concern areas.
2. Design and/or construct project(s) that will mitigate the effects of isolated surface temperatures through nature based techniques like, rain gardens and native plantings.
3. Design and/or construct project(s) that integrate design elements of publicly oriented improvements associated with social vulnerability and LST.
4. Enhance the livability and economic viability by contacting business owners in order to promote sustainability in LST concern areas
5. Support green business opportunity and reduce LST.

### **Monitoring Considerations :**

Draft log below (to be completed by the Township Green Infrastructure Team – i.e. Mayor's Office, Planning, Engineering, Department of Public Works):

Project Location	Projected Implementation date	Mitigation Technique	How was the project planned?	Benefits	Considerations (i.e. Social Vulnerability)