DATE: March 10, 2025

TO: Council Sustainability Committee

FROM: Director of Public Works

SUBJECT: Shade Requirements for New Development

RECOMMENDATION

That the Council Sustainability Committee (CSC) reviews this report and provides direction to staff regarding shade requirements for new development.

SUMMARY

In response to requests from the CSC and related actions in the Climate Action Plan and Environmental Justice Element, staff prepared this report on shade requirements for new development. This report provides current regulations and efforts that the City and other local and state agencies have regarding adding shade in construction projects as well as examples of best practices from other cities.

BACKGROUND

Hayward has a mediterranean climate with warm summers that have average maximum temperatures between 77 to 80 degrees Fahrenheit and humidity levels of 62 to 66 percent.[1] However, the City has experienced several extreme heat days exceeding its average maximum temperatures and the number of heat days has been increasing over the years at a rate faster than what experts have predicted. [2]

Heat impacts people differently and those with the highest risk tend to be vulnerable populations such as older adults, children, people with health conditions, and the disabled. In 2019, the Alameda County General Services Agency Office of Sustainability, StopWaste, and Four Twenty Seven developed a Heat Vulnerability Map for census tracts in Alameda County.[3] The map combines environmental, demographic, and health factors that

[1] https://en.climate-data.org/north-america/united-states-of-america/california/hayward-1469/
[2] Cal-Adapt is a state-funded tool that estimates changes in climate in California. Cal-Adapt projects Hayward to have 11 days out of the year where the daily maximum temperature is above 90.1 °F under a Medium Emissions (RCP 4.5) Scenario. https://cal-adapt.org/tools/extreme-heat/?climvar=tasmax&scenario=rcp45&models=CanESM2%2CCNRM-CM5%2CHadGEM2-ES%2CMIROC5&boundary=locagrid&fid=40191
[3] https://acgsa.maps.arcgis.com/apps/MapSeries/index.html?appid=063725ccf3214fcc9d74d3fe05eae9e5

determine which communities are most vulnerable to extreme heat. Based on these factors, Hayward had various census tracts listed as medium, medium-high, and high vulnerability (see Figure 2).

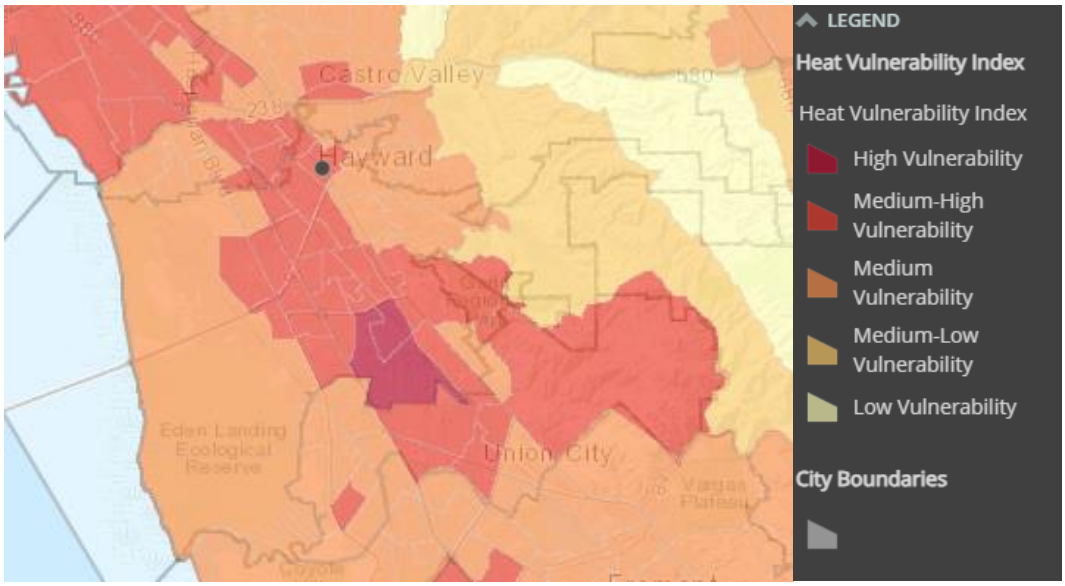

Figure 1 – Heat Vulnerability Index for Hayward

One factor that increases temperatures in certain neighborhoods is the built environment. Areas that have large impervious surfaces, few trees, and dark rooftops absorb and re-emit the sun's heat more than natural landscapes causing land surface temperatures to be higher, a phenomenon known as the urban heat island effect. The Heat Vulnerability map depicts this effect by averaging land surface temperature maximum and minimum within each census tract during a heat wave on September 1, 2017. Hayward was one of the cities that experienced the most extreme daytime temperatures. The results for Hayward can be seen in Figure 3.

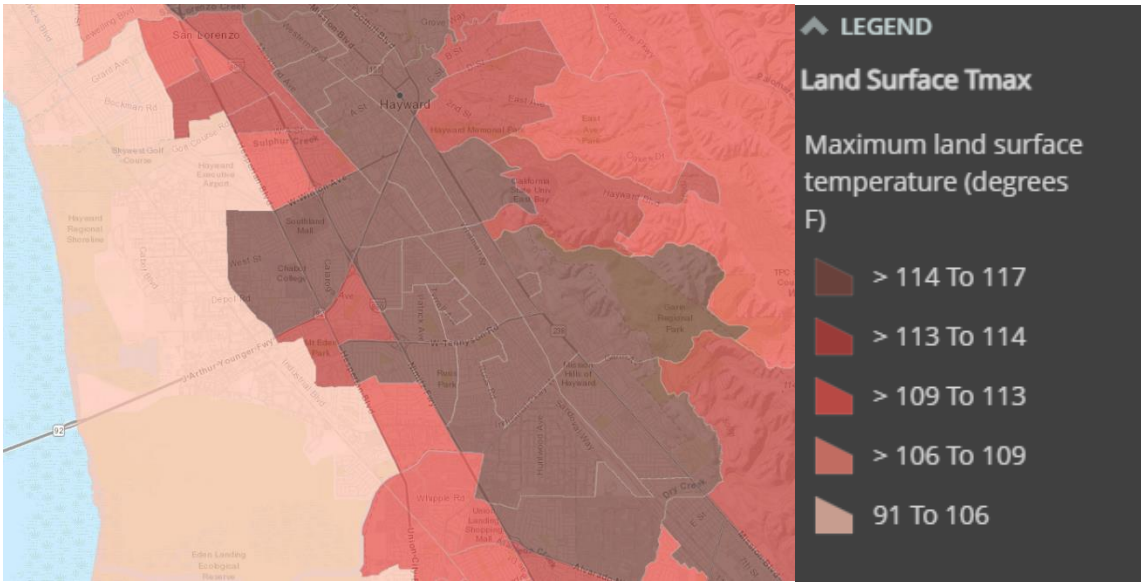

Figure 2 – Land Surface Temperatures Maximum for Hayward

Hayward residents and Council members have expressed the need to increase shade to provide relief to the public during these heat days. The City's 2040 General Plan Environmental Justice element has multiple policies aimed at increasing shade prioritizing disadvantaged communities and low-income neighborhoods and bus stops.[4] See below for the aforementioned policies.

- *Policy EJ-2.4 Green Space through Residential Development - Require future medium-density and high-density development to incorporate green space as part of the development review process to meet community need across the City. Prioritize building green space in disadvantaged communities (DACs), and low-income neighborhoods. Engage the community in green space design and development.*
- *Policy EJ-2.6 Bus Stop Safety - Promote public transportation accessibility by ensuring that all City bus stops have covered shelters, seating, and ability-accessible signage.*
- *Policy EJ-5.4 Tree Canopy - Support active transportation by preserving existing and increasing tree canopy through implementation of an expanded urban greening initiative. [See CAP Programs CAP-CS 1.2, 1.4, 1.5 and 1.6 related to identification of and expansion of urban tree canopy, and updating the Tree Preservation Ordinance].*
- *Policy EJ-4.2. Home Maintenance Programs - Promote home safety by developing public programs that subsidize home-maintenance projects for low-income residents and provide public resources for necessary home improvements. Include incentives for residents to add green infrastructure like rain gardens and tree canopy to their homes.*

Furthermore, in the CSC meeting held on March 13, 2023, Committee members expressed interest in planting more trees in Hayward, particularly in Tennyson. Interest in this topic was again expressed by Committee members at the November 11, 2023, CSC meeting when staff presented on the Hazards Element of the amended 2040 General Plan. Committee members raised the concern that trees take years to grow enough to provide adequate shade and suggested increasing shade by adding artificial shade structures as well. Specific locations such as new housing development, walkways, and places where children frequent, like playgrounds, were also mentioned.

DISCUSSION

Shade in new development can include natural structures like trees and artificial structures like pergolas, gazebos, shade sails, awnings, and canopies. In addition to protecting people from overheating, artificial shade structures provide other benefits such as keeping the equipment below cool which extends the equipment's lifespan and reduces the need for repair. Nature-based shade structures like trees provide ecological benefits such as removing air pollutants, storing carbon dioxide, preventing soil erosion, reducing runoff, and providing habitat to various birds, animals, and insects. Because of these benefits, prioritizing nature-based solutions would support the City's sustainability goals.
While trees typically take years to reach maturity and provide adequate shade, artificial structures can provide immediate shade. Strategic placement of shade structures may also

[4] https://www.hayward-ca.gov/sites/default/files/documents/Final%20Environmental%20Justice%20Element_Jan%202024.pdf

be required; if a shade structure is not orientated correctly, it may not provide optimal shade during the hottest parts of the day and year.

Both options require some maintenance. Trees require occasional pruning and drop leaves that may need collecting. On the other hand, artificial shade structures can require periodic inspections and repairs especially if the material is not durable and weatherproof. Artificial shade structures that use aluminum and steel, which are more durable, may require less upkeep but may initially cost more than materials like fabric and wood.

Current Efforts

City of Hayward - The City's Municipal Code includes language that incentivizes shaded structures for multi-family units. Hayward Municipal Code (HMC) Section 10-1.204, requires multi-family buildings with more than three units to have a minimum of 150 square feet of open space per dwelling unit. These open spaces are required to have amenities, but the developer may choose the types of amenities. The Code provides a point-system and list of amenities from which developers can choose to achieve the points needed for a project. Points for amenity types range from 5 to 75 points and adding a pergola, shade, trellis, or arbor structure would give the developer 15 points.[5] Thus the Municipal Code contains incentives for developers to install such structures.

In terms of parking spaces, HMC Section 10-2.650 requires that parking areas have a minimum of one 15-gallon tree for every six parking stalls unless restricted because of design constraints.[6] The Planning Division also has a Landscape Design Checklist that requires a minimum of one 24-inch box street tree for every 20 to 40 linear feet of street frontage. For parcels abutting BART tracks, site plans must have a minimum of one 15-gallon tree for every 20 linear feet.[7] Additionally, the City's Tree Preservation Ordinance is being updated[8] to align with the City's climate action and environmental justice goals and address the findings in the "City of Hayward Canopy Cover Analysis."[9]

As for bus stops, Hayward currently has 363 bus stops, with 63 of them having bus shelters. The shelters were built by AC Transit and previously maintenance was covered through advertising revenue, but now a portion of the maintenance costs are being covered by the City. Adding new shelters to existing bus stops has gotten more expensive over the years and funding for both installation and maintenance would need to be identified by staff for any new shelters. If adding more bus shelters is pursued, staff would follow the Bus Stop Furniture Guidelines document by AC Transit to identify the appropriate locations, design, size and materials.[10]

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[5] https://library.municode.com/ca/hayward/codes/municipal_code?nodeId=HAYWARD_MUNICIPAL_CODE_CH10PLZOSU_ART1ZOOR_S10-1.200REDI_S10-1.204MIDESTAPALDI

[6] https://library.municode.com/ca/hayward/codes/municipal_code?nodeId=HAYWARD_MUNICIPAL_CODE_CH10PLZOSU_ART2OREPARE_VIDESTPALOSP_S10-2.650LA

[7] https://www.hayward-ca.gov/sites/default/files/documents/Landscape-Design-Checklist.pdf

[8] https://www.hayward-ca.gov/your-government/departments/planning-division/tree-preservation-ordinance-update-project

[9] https://hayward.legistar.com/LegislationDetail.aspx?ID=6863972&GUID=71E595B4-F33C-4E7F-9653-EB7BF98EF7E2&Options=&Search=

[10] https://www.actransit.org/sites/default/files/2023-02/BSFG_Final_2023_01_14.pdf

Other Agencies - The Hayward Area Recreation and Park District (HARD) has made increasing shade in parks a priority, but has found that artificial shade structures sometimes lead to unintended consequences. HARD has installed canvas shade covers at parks in the past and they have been vandalized. More recently, at the new Ashland Zocalo Park HARD added a metal shade structure that won't be easily vandalized. HARD staff suggested that future shade projects will require holistic design thinking and City collaboration.

State Agencies - The State of California also has shade structure requirements for some new development. Playgrounds in childcare centers are regulated by the California Department of Social Services and are required to have at least 75 square feet of outdoor activity space per child. The Department also requires that the space be situated to provide a shaded rest area, but there is not a minimum size specified.

Case Studies

Few cities have artificial shade structure requirements. Cities that do are located outside of California, in desert regions, and considered some of the hottest cities in the United States. Some of those cities that staff reviewed are Gilbert, AZ; Phoenix, AZ; and Las Vegas, NV. These cities have shade-related master plans with design guidelines or codified shade requirements. Most cities are addressing shade through tree planting and tree preservation. Following is a list of cities in California that have shade requirements or best practices in their projects, ordinances, or design guidelines.

Redwood City, California – In 2021, the City of Redwood City added shade structures at Magical Bridge Playground, a roughly one-acre playground designed to be socially inclusive for people with physical and cognitive disabilities. Three shade structures were added above a metal slide and in two other areas most used by afternoon park users.[11] However, this addition was a unique situation. The city prioritizes keeping mature trees and planting trees for shade over artificial shade structures. At another site, the city added amenities around existing, mature trees with the goal of having maximum shade during the afternoon. In other parks and play areas, the city is planting trees near existing temporary shade structures so the structures can be removed later down the line once trees reach full maturity. As a best practice, the city adds metal roofs over picnic areas and fabric shade structures over play areas.

San Jose, California – In 2020 and late 2024, City of San Jose installed fabric shade sails at three parks – Doerr, Metcalf, and Los Paseos. All three parks have shade sails over portions of the playground area.[12]

Walnut Creek, California – In 2020, the City of Walnut Creek installed a large double cantilever shade structure covering the picnic area in their Rudgear Park.[13]

[11] https://climaterwc.com/2021/05/03/magical-bridge-playground-temporarily-closes-so-shade-structures-can-be-installed/
[12] https://yerba-buena.net/project/metcalf-los-paseos-park-shade-structures/
[13] https://nextdoor.com/agency-post/ca/walnut-creek/city-of-walnut-creek/city-of-walnut-creek-new-shade-structures-to-be-installed-at-rudgear-park-170548653/

Alamo, California – In 2018, Contra Costa County Public Works added Hemme Station Park along the Iron Horse Trail that pays tribute to the Union Pacific Railroad station that was previously located there. The park includes a large structural pavilion that resembles a train station intended to provide ample shade for bikers and hikers using the trail.[14] Four years later, their Public Works added more shade structures to cover the park's train-engine-shaped play structure.

Davis, California – In 2022, the City of Davis's Arroyo Park added two soft top pool area shade structures and a hard top steel pavilion shade structure with a picnic area underneath.[15] This project came at the request of residents wanting more shade added in the Arroyo Park survey and the 2012 Parks Master Plan, their ten-year plan and funding strategy for improving their parks.[16]

Considerations for New Shade Requirements

If new shade requirements are investigated for Hayward, staff would research the following potential considerations:

- Adding additional shade structures to a site would count toward the total lot coverage allowed by the City's zoning regulations. This could impact a developer's ability to maximize the development potential of a site.
- Adding permanent shade structures may add to the total impervious surface area of a site which would require additional storm water treatment areas, further increasing the cost of development.
- Placement of shade structures near property lines would need to comply with setback requirements.
- Requiring shade structures could impact the ability to provide additional landscaping areas with shade trees.

ECONOMIC IMPACT

A new policy or ordinance requiring shade structures in new development may increase upfront construction costs but could lower costs in the long run. For example, adding shade structures will increase maintenance and construction costs for developers and for the City; these additional costs have not been estimated and would require reaching out to developers and other stakeholders to calculate an estimated value However, the equipment and pavement under the shade structure will deteriorate at a slower rate and reduce costs in resurfacing and replacements. Furthermore, the cooling effect from shade structures will reduce air conditioning costs for buildings with added shade.[17] One study found that

[14] https://www.nrpa.org/parks-recreation-magazine/2018/june/increasing-activity-and-engagement-at-hemme-station-park/
[15] https://www.cityofdavis.org/city-hall/improvement-projects/arroyo-park-shade-structures-project?utm_source=chatgpt.com
[16] https://www.cityofdavis.org/home/showpublisheddocument/3160/635713549755500000
[17] https://www.energy.gov/sites/prod/files/2014/04/f14/Landscaping101_finalv2.pdf

adding bus shelters has been correlated with an increase in ridership.[18] Other studies have shown that trees improve the economic vitality of business districts and increase property values; people are more likely to visit commercial areas with more trees, pay more for parking with shade, and more highly value homes and apartments with trees and a greener setting.[19]

FISCAL IMPACT

This agenda item has no impact on the City's General Fund or other funds. If an ordinance requiring shade structures in new development is considered, staff would prepare a fiscal impact analysis, including possible staffing impacts associated with enforcement.

STRATEGIC ROADMAP

This agenda item supports the Strategic Priority of *Champion Climate Resilience & Environmental Justice.* Specifically, this item relates to the implementation of the following project:

Project CP12: Implement Year 1 Programs from the adopted General Plan Environmental Justice Element, with a focus on mitigating the impact on frontline communities

There are four policies in the Environmental Justice Element that relate to adding shade.

SUSTAINABILITY FEATURES

Adding shade structures is an important climate mitigation strategy for cooling the surrounding environment during heat days and areas facing urban heat island effects.

PUBLIC CONTACT

No public contact was made for this agenda item. If new shade requirements are considered, staff would reach out to developers and other stakeholders to collect input before formalizing proposed requirements.

[18] https://www.sciencedirect.com/science/article/pii/S2590198221000300
[19] https://www.sausalitobeautiful.org/economic-value-of-urban-trees/

NEXT STEPS

Staff will take the appropriate next steps following input from the CSC.

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Approved by:

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