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## Architectural Review Board Staff Report

**From: Planning and Development Services Director**  
**Lead Department: Planning and Development Services**

**Meeting Date: July 18, 2024**  
**Report #: 2404-2883**

### **TITLE**

Study Session to Review the Draft Ordinances Updating Lighting Standards (Palo Alto Municipal Code (PAMC) Section 18.40.250) and introducing Bird Safe Design standards (PAMC Section 18.40.280)

### **RECOMMENDATION**

Staff recommends that the Architectural Review Board (ARB) conduct a study session to review and provide feedback on the draft ordinances updating the existing lighting standards (PAMC Section 18.40.250) that align with Dark Sky principles and introducing Bird Safe Design standards (PAMC Section 18.40.280).

### **EXECUTIVE SUMMARY**

As directed in accordance with the Implementation Plan for Council priorities and to comply with Comprehensive Plan Policy L-6.3, staff has drafted ordinances to reduce light pollution and protect avian species. The draft lighting ordinance modifies the existing lighting standards to reduce light pollution in alignment with Dark Sky principles. The draft bird-safe design standards ordinance requires bird-safe design principals to be incorporated into building design to better protect avian species.

The draft ordinances reflect:

- feedback received from the ARB during a previous study session,
- a review of model ordinances from Dark Sky International and the Santa Clara Audubon Society,
- consultation with architects and designers, conversation with retailers and suppliers,
- working with a consultant for technical assistance, and
- research on regulations implemented in other jurisdictions.

Staff will consider revisions to the draft ordinances based on comments from the ARB and community members. The revised draft ordinances will be presented to the Planning and

Transportation Commission for its recommendation to Council. Council consideration is tentatively scheduled for September 2024.

## **BACKGROUND**

On July 3, 2014, the Architectural Review Board (ARB) received a presentation (Attachment D) from the Santa Clara Valley Audubon Society entitled 'Building with Birds in Mind.' Since that time, requirements related to bird safety have been applied on a case-by-case basis through conditions of approval.

On February 13, 2023, the Council selected and approved the 2023 City Council Priorities and Objectives. Under the Climate Change and the Natural Environment (CC&NE) category, Council directed staff to initiate an evaluation of strategies to protect natural habitats such as bird safe glass and wildlife protection from light pollution in accordance with implementation measure CC&NE 6.

On Monday January 29, 2024, Council included "Climate Change and the Natural Environment: Protection and Adaptation" as a continued priority for this year.

Planning and Development Services has worked with advocates, researched the topic, collaborated across departments, and consulted with a team from Michael Baker International (MBI). MBI provided additional background information and expertise on bird-safe design, to prepare the draft ordinance. Conversation with architects, designers, retailers, and suppliers further informed the current version.

The ordinance would build upon and incorporate existing lighting standards codified in PAMC Section 18.40.250 (Attachment A) as well as input from stakeholders related to light pollution and avian safety in the built environment.

On February 15, 2024<sup>1</sup>, the ARB reviewed the concept presented by staff for both Dark Sky and Bird Safe Design regulations. The ARB expressed its opinion that staff should explore differentiated management approaches for distinctive areas within the city (e.g., foothills, Baylands, and urbanized areas) for both ordinances. In addition, the ARB recommended exempting residential uses from the Bird Safe Design ordinance to avoid hindering housing production efforts with added high costs to features such as windows for multi-family uses and burdensome costs to small projects, such as single-family uses. With respect to lighting, the ARB requested staff investigate alternative methods for regulating brightness level (e.g. per square foot, per acre for lots, and per foot for string lights) to ensure a more equitable application of the ordinance.

Lighting and DarkSky International

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<sup>1</sup> Link to the recorded ARB meeting on February 15, 2024: <https://midpenmedia.org/architectural-review-board-77-2152024/>

The term “dark sky” generally refers to movement and achievement of significant reduction in light pollution so that the sky returns or becomes closer to its natural nighttime darkness. Jurisdictions can implement regulations to decrease light pollution, and many cities have adopted dark sky ordinances in an effort to reduce light pollution.

DarkSky International is a recognized worldwide authority combatting light pollution.<sup>2</sup> The organization publishes guidance for communities seeking to achieve a “dark sky” and decrease light pollution. The framework focuses on the five principles, which have been incorporated into the proposed ordinance:

1. Useful: Use light only if it is needed. All light should have a clear purpose. Consider how the use of light would impact the area, including wildlife and their habitat.
2. Targeted: Direct light so it falls only where needed. Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.
3. Low Level: Light should be no brighter than necessary. Use the lowest light level required. Be mindful of surface conditions, as some surfaces may reflect more light into the night sky than intended.
4. Controlled: Use light only when it is needed. Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.
5. Warm-colored: Use warmer color lights where possible. Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.

#### Bird Safe Design

Bird safe glass regulations are intended to protect the natural environment by enhancing bird-safety features in the built environment. The City's Comprehensive Plan includes a policy and associated program related to bird-friendly design.

- Policy L-6.3: Encourage bird-friendly design.
  - Program L6.3.1: Develop guidelines for bird-friendly building design that minimizes hazards for birds and reduces the potential for collisions.

Through the draft ordinance, the City seeks to establish regulations to reduce avian mortality as it relates to the built environment, particularly windows and other glass features on buildings. The ordinance would implement the Comprehensive Plan policy and establish uniform standards for development applications, eliminating the need for a case-by-case approach.

#### Project Description

The proposed project is a staff-initiated code amendment updating the City's lighting standards and introducing new bird safe design standards.

#### *Lighting Ordinance*

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<sup>2</sup> Link to the DarkSky International website: <https://darksky.org/who-we-are/advocates>

The draft ordinance updates the City's existing lighting standards (18.40.250) to address light pollution through several key measures. The proposed amendments align with Dark Sky principles, promoting reduced light pollution overall. To ensure consistent enforcement and simplify compliance for property owners, these regulations would apply uniformly across the entire city. Additionally, the ordinance mandates shielding for all exterior lighting fixtures to further minimize light trespass. While maintaining the foot-candle measurement as the primary means of controlling light trespass, the ordinance introduces a new color temperature limit of 3,000 Kelvin. To further reduce excess lighting, the ordinance mandates automatic extinguishment or motion-sensor activation for exterior lights by 10:00 p.m. or whenever people are not present, whichever is later.

#### *Bird Safe Design*

To enhance bird safety, the draft ordinance would amend Chapter 18.40 (General Standards and Exceptions) to create a new section establishing bird safe design standards. The ordinance includes a requirement to comply with at least one of three Bird-Safe Treatment options for all applicable buildings. Having several options to choose from provides more flexibility for applicants. These principles go beyond limiting untreated glass on building facades. They also encourage alternative approaches approved by qualified professionals and promote broader design practices that reduce bird collisions. Some exemptions are recommended for historic structures, small ground-floor retail storefronts, and particular residential projects.

### **ANALYSIS**

The proposed ordinances incorporate comments from the February ARB study session, the provisions included in model ordinances from Dark Sky International and the Santa Clara Audubon Society for Dark Sky regulations (Attachment C), and a review of regulations on both Dark Sky and bird safe design from other jurisdictions (Attachment D).

#### Lighting Ordinance

Palo Alto Municipal Code (PAMC) Section 18.40.250 includes standards for lighting. Staff updated this section to include additional lighting standards to achieve a reduction in light pollution and for consistency with Dark Sky principles. The updated ordinance has the following components:

- Applicability
- Shielding
- Illumination Level
- Lighting Control
- Special Purpose Lighting

#### *Applicability*

The proposed requirements would apply the updated exterior lighting standards uniformly across the city instead of having different requirements for different areas. Staff believe this

approach would make the regulations easier for applicants and property owners to understand and comply with the requirements. Review of similar standards in neighboring jurisdictions revealed no differentiation based on the presence of natural environments within city limits. Implementing consistent regulations across the city aligns with practices in neighboring communities and ensures a more equitable application of the requirements.

### *Shielding*

Existing lighting requirements address shielding for pedestrian and security lighting, architectural lighting, and lighting fixture location. Staff recommend expanding these requirements to encompass all light fixtures to reduce light pollution. Limited exceptions are proposed for low-voltage landscape lighting, low-voltage lighting for illuminating outdoor art or public monuments, lighting on a property line, and string lighting.

### *Illumination Level*

Following the recommendations from Dark Sky International and the Santa Clara Audubon Society, staff initially proposed maximum brightness requirements measured in lumens. Lumens are a measurement unit of lighting brightness, commonly used in other jurisdictions, but can be a complex concept for enforcement purposes. Therefore, staff has revised the ordinance to retain the existing foot-candle measurement as the primary means to mitigate light trespass from exterior lighting to adjacent properties.

In addition to maintaining the foot-candle measurement, staff also considered color temperature limitations. While initial discussions with environmental advocates from the Santa Clara Audubon Society and the Sierra Club Loma Prieta Chapter favored a 2,700 Kelvin limit due to its reported wider availability, public safety concerns emerged. Specifically, there were concerns about a lower color temperature potentially affecting visibility in critical areas. A minimum color temperature of 4,000 Kelvin is recommended for public safety purposes. Taking these concerns into account, along with practices in neighboring jurisdictions with dark sky ordinances, staff determined a 3,000 Kelvin limit offered a balanced approach, though the ARB may want to consider a higher limit for safety-sensitive uses.

### *Lighting Control*

The existing lighting requirements encourage the installation of timers and dimmers to reduce light glare for both exterior and interior lighting during nighttime hours. Additionally, shielding of interior lighting fixtures to prevent glare and light trespass beyond the property line is required.

Building on these existing guidelines, staff propose enhanced lighting control measures for all outdoor lighting. The proposed ordinance would require extinguishment of exterior lights or motion-sensor activation by 10:00 p.m., or whichever time comes later when there is no person present in the outdoor area. To further minimize unnecessary light usage, the motion sensors would deactivate after a maximum of 10 minutes. It is important to note that while the updated ordinance proposes these automatic extinguishment measures for exterior lighting, the existing standards for interior lighting would remain unchanged.

### *Special Purpose Lighting*

The Special Purpose Lighting Subsection introduces new standards for and addresses four key categories: outdoor security lighting, outdoor recreational facilities lighting, gasoline service station lighting, and string lighting.

- **Outdoor Security Lighting.** Requirements for outdoor security lighting mirror general lighting standards, including requirements for lighting control and shielding. The provision prohibits the use of floodlights and limits luminaires to a maximum of 100 watts or 1,600 lumens, whichever is lower.
- **Outdoor Recreational Facilities Lighting.** Outdoor Recreational Facilities Lighting. Lighting for any outdoor recreational facilities or athletic facilities lighting would need to adhere to Illuminating Engineering Society (IES) guidelines based on the type of activity and should only illuminate the playing surface and stands. Light levels should be adjustable for different tasks, and off-site light pollution minimized. Lights must be off by 10:00 p.m., unless in use for active play, in which case timers must be installed to prevent accidental overnight illumination.
- **Gasoline Service Station Lighting.** Consistent with general lighting standards, service station lighting requires all fixtures in the ceiling of canopies to be fully recessed or mounted directly to the underside. This regulation aims to minimize light spillover by prohibiting light fixture placement on top of the fascia. The maximum light intensity level for canopies is set at 12.5 foot-candles, with a maximum luminaire height of 15 feet above finished grade.
- **String Lighting.** String lighting prohibits blinking or chasing effects. Consistent with other outdoor lighting, a color temperature of 3,000 Kelvin or brightness not exceeding 42 lumens is required. In commercial and mixed-use areas, string lighting is restricted to designated outdoor dining or display areas, or to common open space and would be subject to Director approval. String lighting regulations would not apply to holiday or seasonal lighting.

### Bird Safe Design Ordinance

The draft ordinance would establish a new section 18.40.280 under PAMC Chapter 18.40 for the Bird Safe Design standards. The new section has the following components:

- Applicability
- Bird Safe Treatment
- Bird Safe Treatment Location
- Alternative Compliance
- Bird Safe Design Standards
- Exemptions

### *Applicability*

In initial recommendations, staff proposed the application of bird-safe design standards to all newly constructed buildings or properties undergoing alterations or renovations, regardless of

development type or zoning district. However, the current staff proposal limits the regulations to projects that require separate planning approval. This limitation was added to avoid triggering bird-safe design standards for smaller projects. The intent is to prevent burdening individual single-family homeowners or smaller development property owners.

### *Bird Safe Treatment*

Bird-safe treatment includes three options for making buildings safer for birds, requiring at least one option for compliance.

- Fenestration and glazing: This is the most common and effective way to address bird collisions, as most occur due to reflectivity on glass or glazing. It provides specific design standards for patterns on fenestration or glass.
- Exterior features: Permanent features like screens, shutters, or shading devices can minimize glare and reflection. This option is often more approachable for single-family homeowners or smaller developments than fenestration/glazing (which may not be readily available) or threat factor analysis.
- Threat factor: This system, developed by the American Bird Conservancy and architects, quantifies the risk a material poses for bird collisions. Staff proposes a threat factor of 15 or below, consistent with the U.S. Green Building Council's Bird Collision Deterrence Pilot Program.

### *Bird Safe Treatment Location*

Similar to requirements in other jurisdictions, staff included proposed limitations on where the Bird Safe Treatment should be incorporated at minimum:

- Below 40 Feet: Bird Safe Treatment should be incorporated on no less than 90 percent of the facade's surface area between the existing grade and 60 feet above.
- Above 40 Feet: Bird Safe Treatment should be incorporated on no less than 60 percent for the portion of the facade exceeding 40 feet in height.

The initial height threshold staff considered was similar to other jurisdictions, such as San Francisco and Cupertino, at 60 feet. However, after reviewing additional research, including voluntary requirements on bird-safe design in the California Green Buildings Standards Code (CALGreen), staff adjusted the threshold to 40 feet. This aligns with CALGreen standards and is deemed more appropriate for Palo Alto. Aligning the City's standards with CALGreen standards is consistent with ARB members' recommendations.

### *Bird Safe Design Standards*

While Bird Safe Treatments are central to preventing bird collisions, the proposed standards encompass a broader range of bird-safe design principles. These principles align with best practices commonly found in other jurisdictions. They include:

- Bird Hazard Installations. Bird Hazards Installations are defined as "monolithic glazing installations that provide a clear line of sight on the exterior of buildings, including, but

not limited to, glass awnings, glass handrails and guards, glass wind break panels, or glass acoustic barriers.” The ordinance does not prohibit these structures or components in a building but requires them to be constructed of bird-friendly materials, regardless of their height.

- Enhanced Facade Material Requirements. In addition to the standard practices, the ordinance proposes a further restriction. All building facades and exteriors will be required to utilize any reflective building materials with a maximum reflectance level of 20 percent.

### *Exemptions*

The draft ordinance exempts a few building types from the bird-safe design standards. These exemptions include:

- Historic Structures: Buildings with historical designation are exempt, recognizing the importance of preserving cultural heritage.
- First-Floor Retail Storefronts: Storefronts on the ground floor, up to 14 feet in height, are exempt to avoid undue burden on small businesses.
- 100% affordable housing projects, as defined in Section 18.32.030, are exempt from the requirements for Bird-Safe Treatments. This exemption acknowledges the financial constraints faced by these projects, which prioritize providing essential affordable housing while operating within limited budgets.
- Single-family homes outside the Bird Sensitive Area are exempt. This area, generally within 300 feet of water features, parks, or open spaces larger than one acre, identifies areas more sensitive to bird populations due to proximity to vegetation and natural features. Since single-family homes generally pose lower risks of bird collisions due to smaller surface areas compared to nonresidential or larger multifamily buildings, and the cost burden of bird-safe design could be disproportionately high for individual homeowners, exempting single-family homes outside the Bird Sensitive Area may be appropriate.

## **DISCUSSION**

Staff requests ARB members’ feedback on the following items:

### Lighting Ordinance: Applicability

The applicability of the draft Lighting Ordinance currently covers all new structures and exterior modifications that require separate planning approval. Although the applicability currently does not delineate zoning districts or specific areas like the Foothills and Baylands to implement lighting standards, this lack of specificity may create burdens on property owners seeking minor alterations, especially unrelated to lighting.

The condition or parameter can be expanded to provide relief to not only single-family homeowners but also to other property owners. The following thresholds are provided for ARB consideration to facilitate discussion and feedback on the appropriate level of this condition, so



that a good balance is retained, and some cost and maintenance burdens are mitigated for property owners.

In addition to new construction, “substantial remodel” can be included in the scope of applicability. This would prevent minor and smaller work on buildings from triggering compliance with the new lighting requirements. Several existing definitions could be considered for “substantial remodel”.

- PAMC 16.14.070 has multiple definitions amended from the Building Standards Code, one of which defines "Substantial Remodel" as follows:  
**“SUBSTANTIAL REMODEL (AKA 50-50-50 RULE).** Any project or projects that affects the removal or replacement of 50% or more of the linear length of the existing exterior walls of the building, and/or 50% or more of the linear length of the existing exterior wall plate height is raised, and/or 50% or more of the existing roof framing area is removed or replaced, over a 3-year period. Any permit(s) applied for will trigger a review of a 3-year history of the project. This review will result in determining if a substantial remodel has occurred. The Chief Building Official or designee shall make the final determination regarding the application if a conflict occurs.”
- California Building Code 2022 defines “Substantial Improvement” as follows:  
**“SUBSTANTIAL IMPROVEMENT.** For the purpose of determining compliance with the flood provisions of this code, any repair, alteration, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure, before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed.”
- California Building Code 2022 defines “Substantial Structural Alteration” as follows:  
**“SUBSTANTIAL STRUCTURAL ALTERATION.** An alteration in which the gravity load-carrying structural elements altered within a 5-year period support more than 30 percent of the total floor and roof area of the building or structure. The areas to be counted toward the 30 percent shall include mezzanines, penthouses, and in-filled courts and shafts tributary to the altered structural elements.”

Staff prefer to use the existing "substantial remodel" definition in PAMC 16.14.070, as it is a definition the City has adopted and implemented over the years. However, staff recommend adding a new definition to the lighting section to ensure coverage if the existing definition changes due to the Berkeley electrification lawsuit or other future reasons. The additional California Building Code definitions were provided for the ARB to consider if they wish to modify an existing definition or create a new one. The additional definitions provide some thresholds (percentages) to consider.

#### Bird Safe Design Ordinance: Applicability

In addition to applying the "substantial remodel" definition to the Lighting section, it can also be considered for the Bird Safe Design Ordinance. The draft Bird Safe Design Ordinance has the same applicability as the Lighting Section: all new structures and exterior modifications that

require separate planning approval. Almost all single-family homes requiring only building permits would not be captured and would be automatically excluded under the current draft. Applying "substantial remodel" in lieu of "exterior modification that requires separate planning approval" may be a preferable way to apply the new standards.

#### Bird Safe Design Ordinance: Exemptions

From conversations with glass retailers, suppliers, and manufacturers, staff found that Bird-Safe Treatments are rarely requested for residential buildings. A few local retailers were aware of bird-safe standards (such as fritted glazing or obscure patterned glass) but confirmed that these are not readily available and must be ordered from suppliers and manufacturers with specific designs to be laminated or baked onto glass.

Although no specific dollar amount or percentage difference was provided by retailers and suppliers, they confirmed that treated glass is more expensive than standard glass. There are some general estimates of the cost of implementing bird-friendly design from the "Building Safer Cities for Birds" report by Yale Law School and the American Bird Conservancy.<sup>3</sup> Although the cost may vary based on specific project requirements, building types, and local conditions, the report states that implementing bird-safe design would increase costs for new construction by approximately two to ten percent.

In addition, single-family homes generally have less glass surface area and are less reflective than larger non-residential buildings. This means single-family homes, or other smaller residential properties, pose a lower risk of bird collisions. As described above, implementing Bird-Safe Treatment could be difficult and expensive, especially for retrofitting existing homes.

There are other ways to consider exemptions, especially for single-family homes and smaller residential properties, to relieve the owners from the burden associated with bird-safe design standards.

- **Bird Sensitive Area.** The current draft Bird Safe Design Ordinance incorporates this approach. As detailed in the ordinance, a Bird Sensitive Area is established, generally within a 300-foot buffer of water features, parks, open spaces exceeding one acre, and properties zoned as Open Space. This 300-foot buffer, commonly used in urban planning to protect sensitive areas, has been implemented in San Francisco and Cupertino for bird-safe design. Given that single-family homes are less likely to cause bird collisions due to their smaller size and that bird-safe design could impose a disproportionate financial burden on homeowners, exempting such homes located outside designated Bird Sensitive Areas may be a reasonable solution. However, depending on how the buffer is drawn, it may seem unfair for homes that are immediately adjacent to each other if one is required to comply with bird-safe design standards and the other is not.
- **Height Threshold.** The current draft ordinance requires Bird-Safe Treatment to be incorporated starting at the existing grade. An alternative approach is to increase the

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<sup>3</sup> "Building Safer Cities for Birds" report by Yale Law School and the American Bird Conservancy: [https://law.yale.edu/sites/default/files/documents/pdf/building\\_safer\\_cities\\_for\\_birds.pdf](https://law.yale.edu/sites/default/files/documents/pdf/building_safer_cities_for_birds.pdf)

starting height. Berkeley mandates bird-safe design implementation starting at 35 feet and up to 75 feet in height. This approach was adopted due to the limited availability of bird-safe products in local retailers that are typically used by individual homeowners. In addition to cost impacts, this limited availability led to a higher starting point for bird-safe design requirements compared to other jurisdictions that start at ground level. The 35-foot height threshold essentially excluded all single-family homes and some smaller multi-family residential properties in Berkeley. San Francisco also has a 45-foot height parameter as one of the criteria for residential exemption from bird-safe design requirements. However, this approach might result in increased bird collisions, particularly in areas with significant bird populations. Lower-level windows and glazing can still pose risks to birds, especially in areas with abundant vegetation or water bodies that attract them.

- **Glazing Percentage.** San Francisco allows an exemption to incorporate treated glass for residential buildings that are shorter than 45 feet in height and have less than 50% of facades with glazing. Homes that are shorter than 45 feet in height, but have more than 50% of facades with glazing, are required to provide treated glass but only on unbroken and larger size glass areas 24 square feet or larger. This approach provides more flexibility with smaller residential buildings like single-family homes because the requirement for Bird-Safe Treatments will be only required if fenestration and glazing is 24 square feet or larger in size. While individual small windows might seem less hazardous, there is no guarantee that birds collide with windows of larger sizes only due to their flight patterns and behaviors, making a size-based regulation not as effective.

## **NEXT STEPS**

Staff will consider revisions to the draft ordinance incorporating comments from the ARB and community members as appropriate. The revised draft ordinance will be presented to the Planning and Transportation Commission for its recommendation to the Council for adoption.

## **ENVIRONMENTAL REVIEW**

This item is a study session provided to inform the public, to receive feedback from the Architectural Review Board, and comments from the public; therefore, CEQA does not apply. However, the City has reviewed these proposed ordinances in accordance with that authority and criteria set forth in the California Environmental Quality Act. The City, as the lead agency, anticipates that these ordinances will be exempt from CEQA in accordance with CEQA Guidelines Section 15308, which includes actions by regulatory agencies for the protection of the environment.

## **PUBLIC NOTIFICATION & COMMENTS**

Notice of this study session was published in the Daily Post on July 5, 2024, which is 13 days in advance of the meeting. At the time of this report, no written comments have been received on this agenda item; however, this meeting provides an opportunity for community members to

provide feedback on the contents of the forthcoming ordinance. One member of the public spoke at the previous hearing on February 15, 2024, noting the importance of implementing Dark Sky and Bird Safe Design ordinance to protect wildlife and reduce bird collisions and fatality.

**ATTACHMENTS**

Attachment A: Draft ordinance Updating Lighting Standards (PAMC Section 18.26.040)

Attachment B: Draft ordinance Introducing Bird Safe Design standards (PAMC Section 18.40.280)

Attachment C: Model Ordinances from Dark Sky International and Santa Clara Audubon Society

Attachment D: Dark Sky and Bird Safe Design regulations from Other Jurisdictions

Attachment E: Map of Bird Sensitive Area

**AUTHOR/TITLE:**

Kelly Cha, Senior Planner