

# Assessment of Streetlight Options

October 2017

# Background

- The Wellesley MLP is in the process of converting the current High Pressure Sodium streetlights to more cost-effective and environmentally-sensitive LED streetlights.
- Given the impact streetlights have on the community, the MPL sought feedback from the residents and the police on two alternative LED options:
  - 2700 Kelvin lights
  - 3000 Kelvin lights
- The findings are intended to validate the overall acceptability of switching to LED lights and to inform decisions about the type of LED lights that would best meet the community needs.
- It is important to note that the test was conducted using a basic fixture for the LED lights; professional judgement about the impact on the street level performance of the LED lights in the fixtures that are selected will be an important factor in identifying the final lighting recommendation.

# Methodology

- A test of the lighting options was set-up on Croton and Pine Streets, with:
  - Poles on Croton marked with a white tape and fitted with the 2700 Kelvin LED lights
  - Poles on Pine from Washington to the bend marked with yellow tape and fitted with the 3000 Kelvin LED lights
  - Poles from the bend at Pine to the Croton intersection marked with blue tape and fitted with new HPS lights (same wattage/Kelvin as currently used across the town).
- All residents were mailed a one page (legal size) survey, which included an explanation of the proposed streetlight change and a request to visit Croton and Pine to evaluate the three lighting options.
- In addition, the Police Department was asked to have officers visit the test streets and complete the same survey.
- In addition, an electronic link to complete the survey on a mobile device was provided with communications to participate in the study, which included:
  - Text announcement from the Police to residents that register for announcements
  - Announcements at BOS meetings and on MLP and Town websites
  - NRC and Sustainable Wellesley newsletters and emails
  - Coverage in Swellesley Report and What's Up Wellesley

# Methodology

- A total of 457 individuals participated in the survey, with 357 completing the full survey and assessing all the lighting options:
  - 12 police officers (all of whom completed the full survey)
  - 345 residents who visited Pine and Croton and completed the full survey
  - 100 residents who submitted incomplete surveys (generally did not visit Pine/Croton but provided feedback on current lighting)
- The data was analyzed both in total as well as by the following subgroups:
  - Residents vs. Public Safety Officials
  - Order of Exposure: Those visiting Croton first vs. those visiting Pine first
  - Familiarity with the test neighborhood: Those that lived on Pine/Croton vs. those who lived on other streets
  - Streetlight Program Priorities: Those that most highly valued safety/visibility vs. environmental benefits vs. financial savings
  - In-coming Impressions of the Existing Town Streetlights: Those that find the current HPS too bright vs. acceptable vs. too dim
  - Setting for Viewing the Streetlights: Those that viewed the lights only from cars with the headlights on vs. a mix of other methods
  - Weather Conditions: Those that assessed the streetlights during clear vs. foggy/misty/rain

# Key Findings

- Overall, there is receptivity to improving the lighting levels on the streets.
  - Existing perceptions of the current streetlights generally ranges from “about right/acceptable” (51%) to too dim (39%). Very few find the current streetlights too bright (10%).
  - The proposed LED lights were more highly preferred than the current lights.
- The majority of residents (and all the police officers) believe that “improving driver and pedestrian safety/visibility” should be the primary focus of the streetlight program (66% of all respondents rated it the top priority).
  - The remaining respondents were divided between believing that “Achieving environmental benefits/carbon reduction” (18%) and realizing “financial savings to the Town” (16%) should be the most important streetlight program priorities.
- Based on the individual evaluations of each lighting option as well as the comparative evaluations, the White/2700 Kelvin lights appear to be the strongest option, with the current HPS lights also performing well.

# Key Findings

- In terms of preference, White (2700 Kelvin) LED lights were consistently selected as the most preferred lighting option, with all subgroups preferring this choice (or finding it equal to the current HPS lights), except the Police who preferred Yellow (3000 Kelvin).
  - Explanations provided about preference indicate the preference was driven by a desire to balance brightness and glare; some cited that the white/2700 Kelvin lights were warmer than the Yellow/3000 Kelvin lights. Yellow was generally described as creating too much glare, although some liked the brightness. Those favoring Blue/HPS Current Lights often referenced the diffused warmer light and familiarity of the lighting.
- The subgroups that reported the strongest preference for the White/2700 Kelvin lights were:
  - Residents that live in the Croton/Pine neighborhood
  - Those that most highly prioritize financial savings or environmental benefits
  - Those that had an in-coming perception that the existing lights are not acceptable (considering them either too bright or too dim)
  - Those who viewed the lights in a setting other than just in a car with the headlights on
  - Those that viewed the lights in lower visibility weather (rain/fog/mist)

# Key Findings

- Participants assessed each lighting option on an individual basis before reporting their preference. Three areas were evaluated: overall acceptability of the lighting provided, type of change they would like made to the bright/dimness, impression of how the lights compare to the existing Town streetlights.
  - Overall Acceptability: Initial impressions of White/2700 Kelvin and Blue/Current HPS were comparable, with about 7 in 10 considering each to be acceptable (69% and 68% respectively). About half (52%) considered Yellow/3000 Kelvin to be acceptable.
  - Recommended Changes: The majority would prefer Yellow/3000 Kelvin to be dimmer. Although Blue/current HPS and White/2700 Kelvin had strong levels of being about right in terms of brightness (46% and 40% respectively), a sizable portion (36%) wanted the White lights to be dimmer. Those wanting changes to the current HPS lights were equally divided between wanting the lights brighter and dimmer.
  - Comparison to Incoming Impressions of Current Lights: Blue/current HPS received the highest ratings for being the same as the current lights (37% felt Blue was the same as the existing street lights); interestingly, the responses were fairly evenly divided between believing the HPS lights were “better” (24%) and “worse” (27%) than the existing Wellesley lights.

# Key Findings

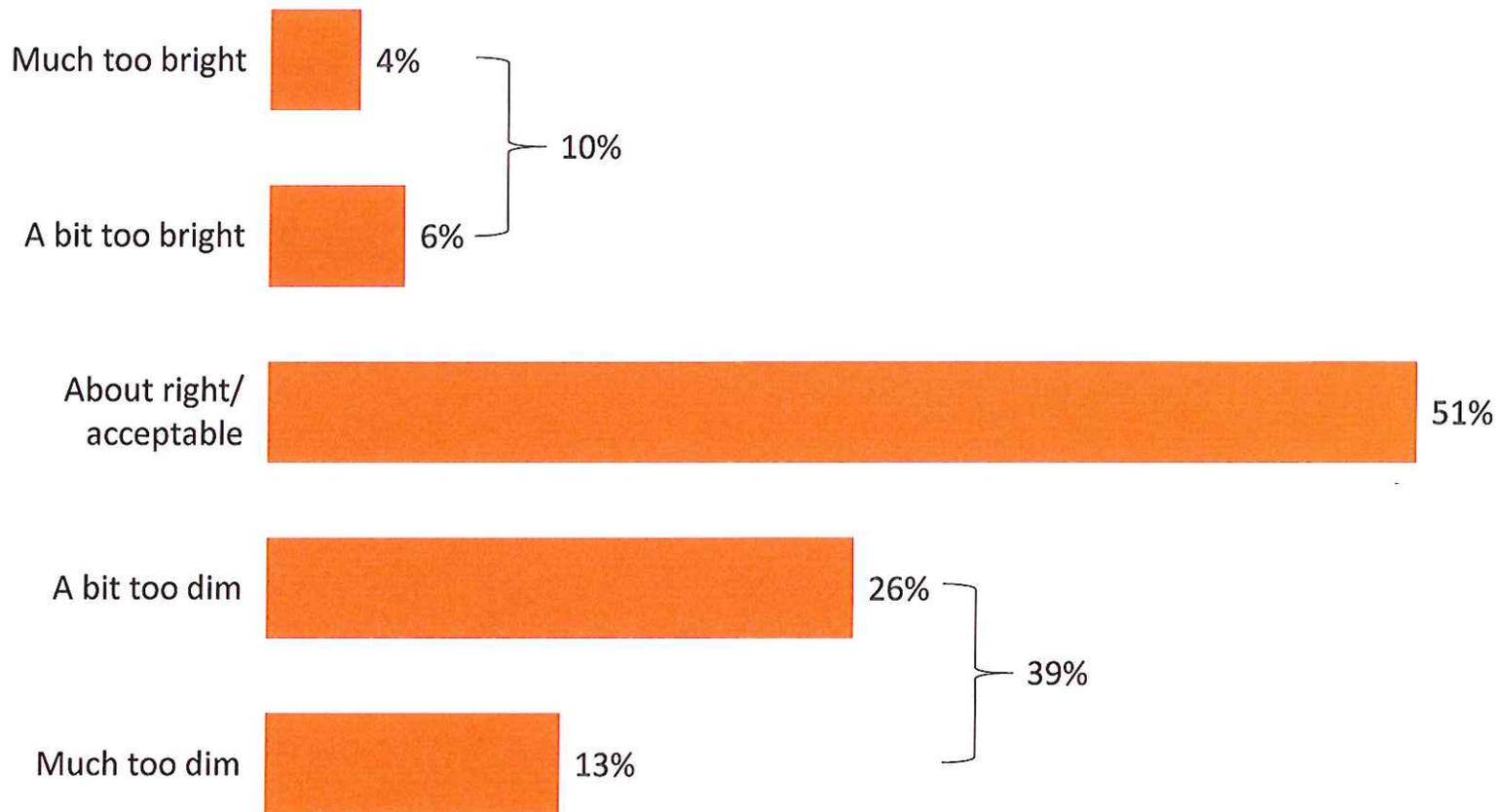
- Comparison to Incoming Impressions of Current Lights (con't): the White/2700 Kelvin were equally likely to be seen as better and worse than the current lights. Half of the respondents felt the Yellow/3000 Kelvin lights were worse than the existing lights.

# Recommendations

- The results of this research support the decision to implement a change to LED lights.
- The 2700 Kelvin was seen as an acceptable and significantly stronger solution than the 3000 Kelvin to the residents in this research.
- In selecting the final lights and fixtures, the following considerations should be priorities:
  - Maintaining good visibility and brightness for safety of pedestrians and drivers
  - Reducing/minimizing glare (which often seemed linked to sharpness vs warmth of the light)
  - Fixtures that assist in diffusing the light

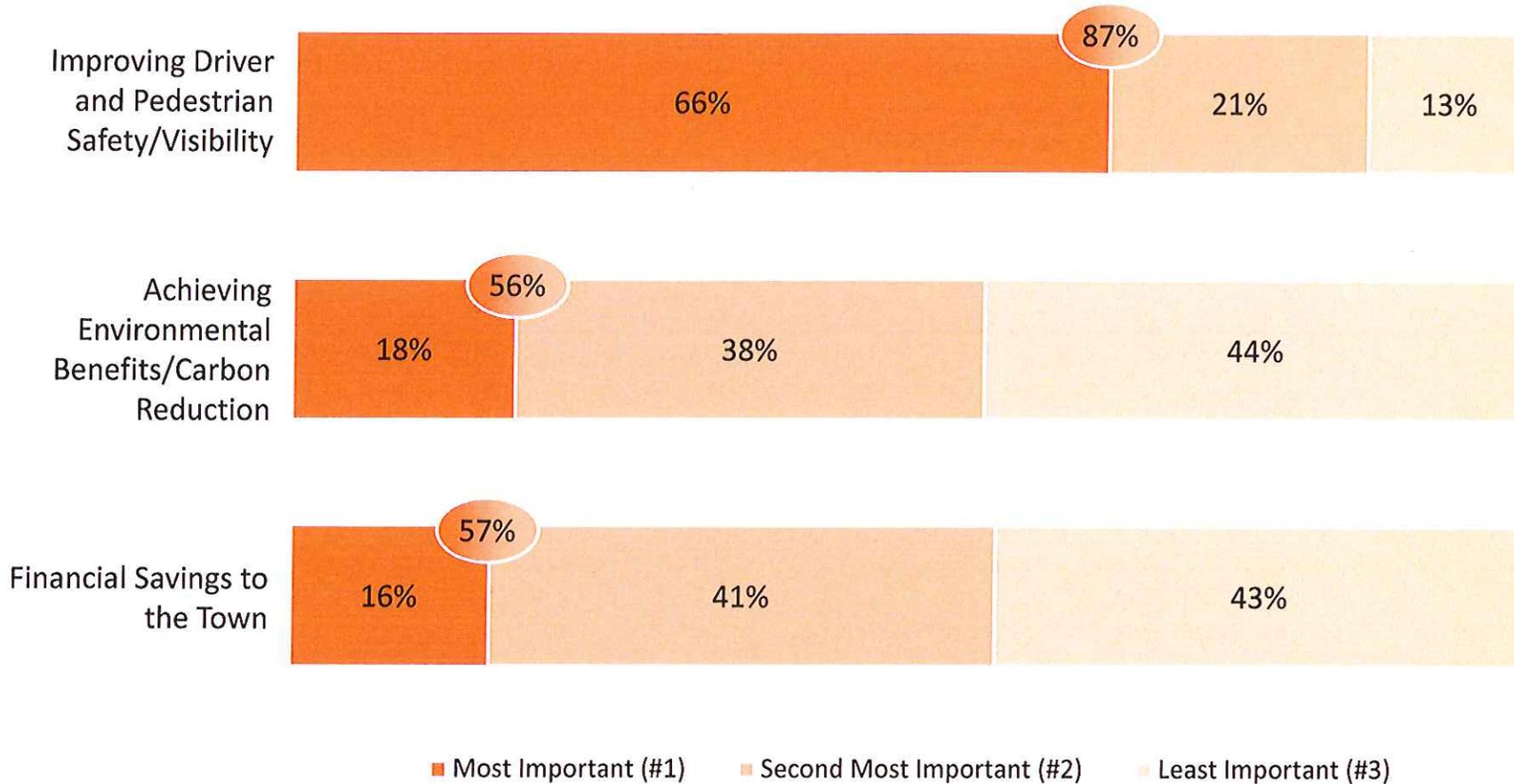
# Impression of Wellesley's Current Streetlights

- One half of Wellesley residents feel the current streetlights are about right/acceptable.
- Of the remaining, 4 times as many feel the current lights are too dim rather than too bright.



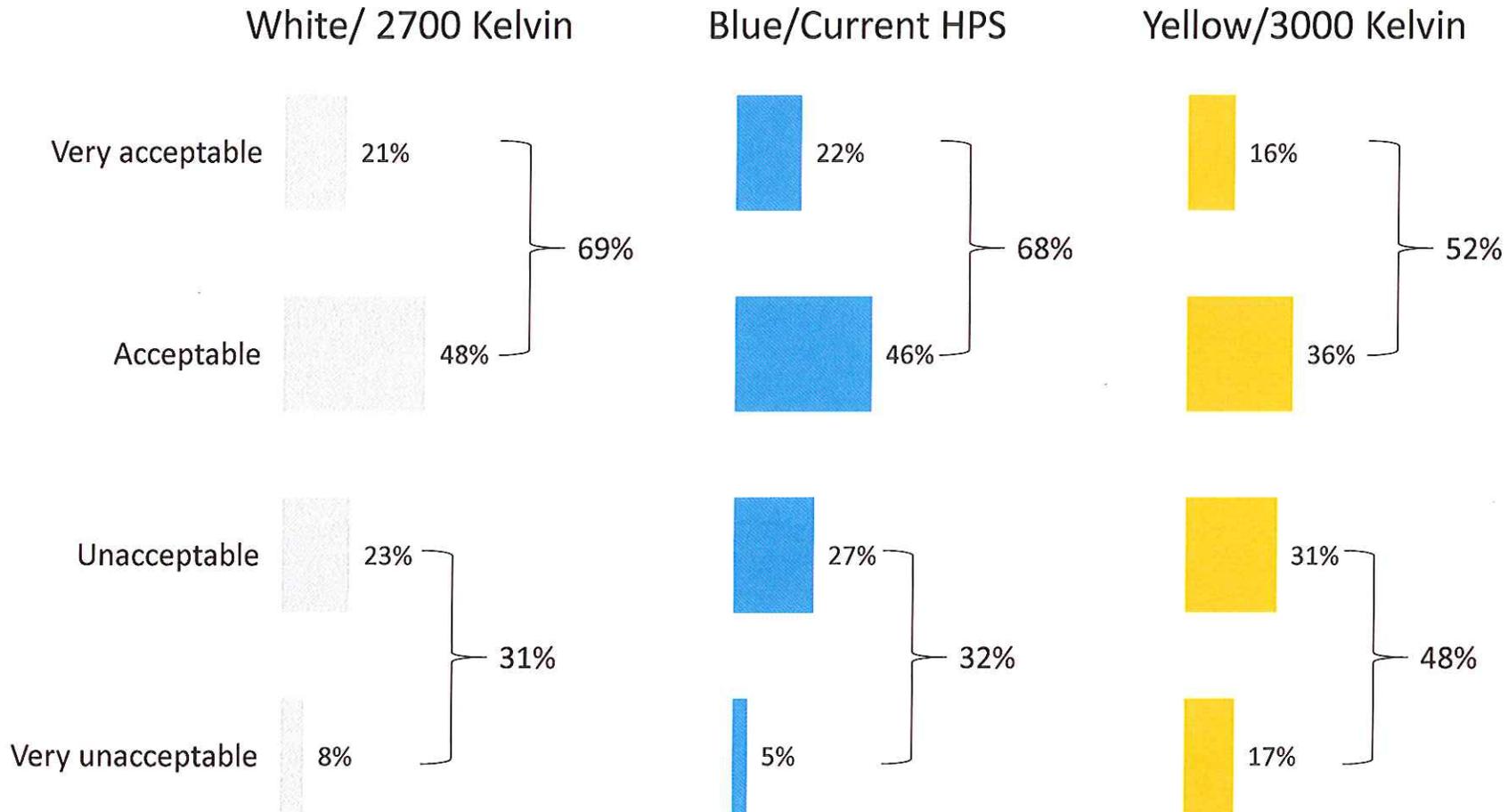
# Ranking of Potential Benefits of Changing Lights

- Two-thirds of residents feel improving safety/visibility is the most important benefit of changing lights.
- The remaining are fairly evenly split between achieving environmental benefits and financial savings as the most important benefit.



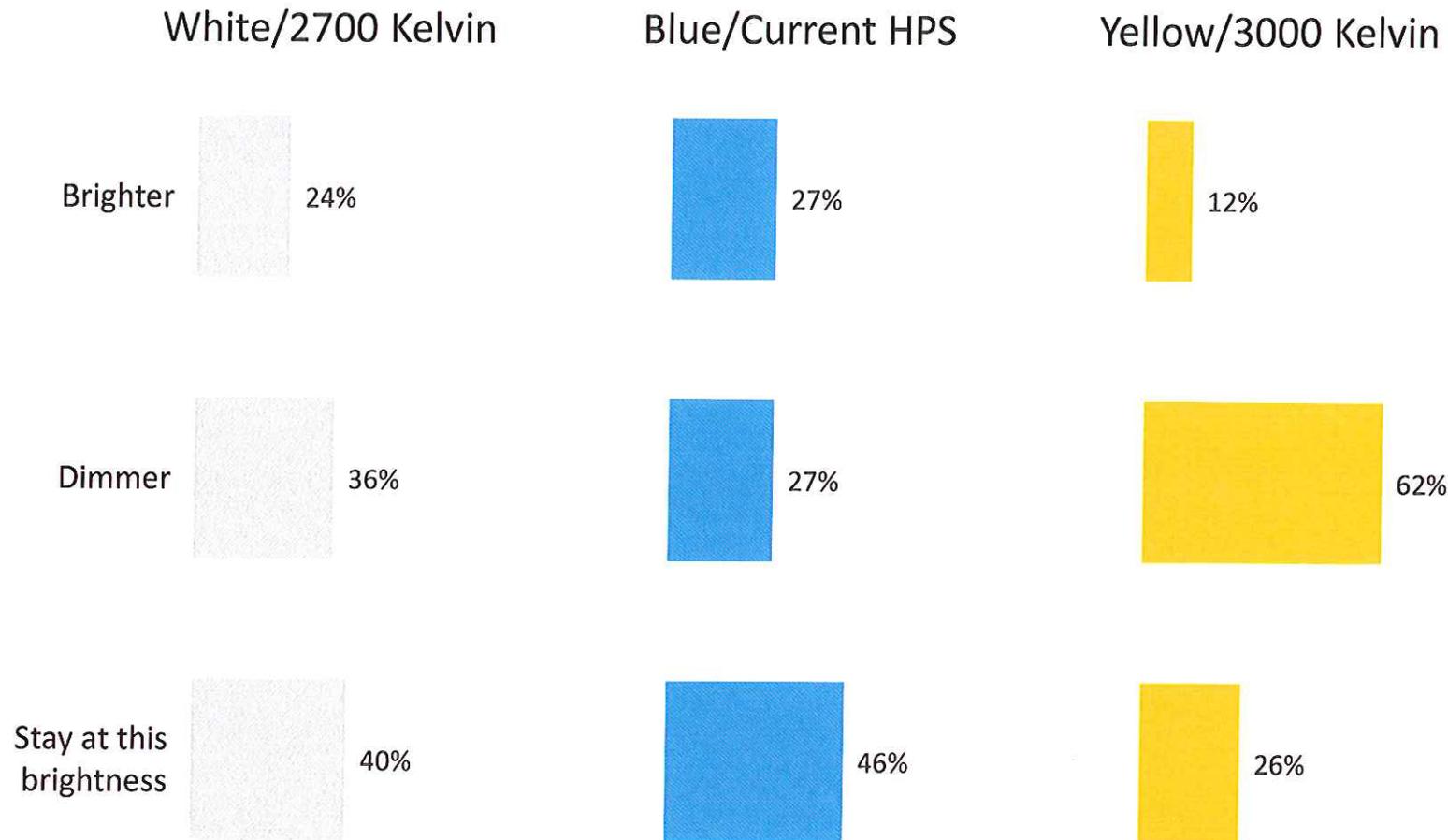
# Overall Acceptability of Lighting Provided

- The majority of evaluators feel both the White and Blue lights are acceptable; response to the Yellow lights was mixed, with slightly more than one-half rating them acceptable.



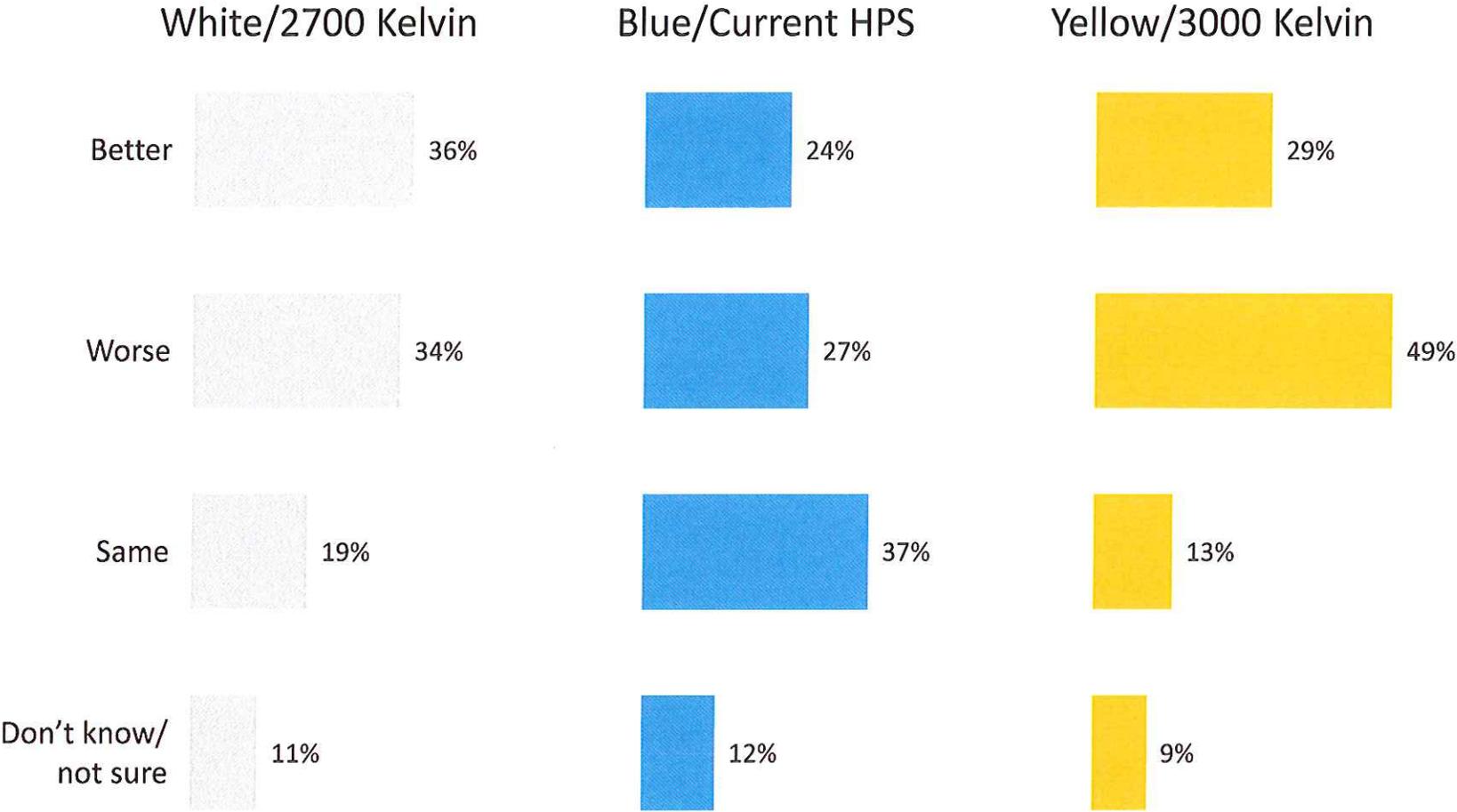
# Would Like Lights to Be:

- The White and Blue lights are perceived to generally have a good level of brightness. Comfort was highest with the Blue lights; over a third would like to see the White lights be dimmer.
- The majority of residents would like the Yellow lights to be dimmer.



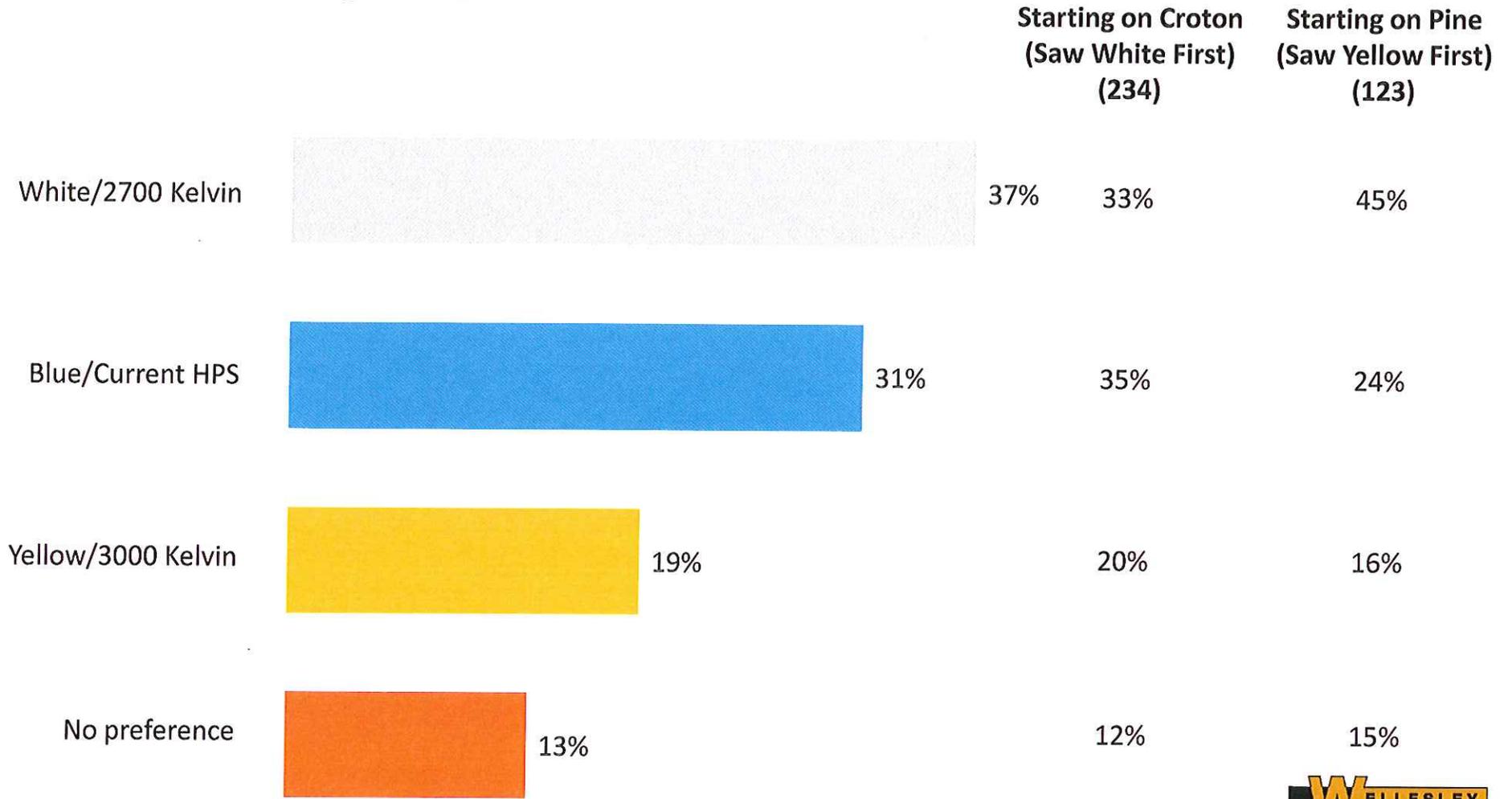
# Comparison to Current Lighting on Wellesley Streets

- The Blue lights were most likely to be rated similar/the same as the current lighting.
- For the White lights, an equal proportion feel they are better and worse than the current.
- One-half feel the Yellow lights are worse than current.



# Preferred Lighting Overall

- The White lighting is most preferred overall, followed by Blue.
- Order in which the lights were evaluated appears to have influenced the level of preference for the White and Blue lights. Preference for White lights was strongest among those starting the evaluation with the Yellow lights on Pine St.



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(Base: 357)

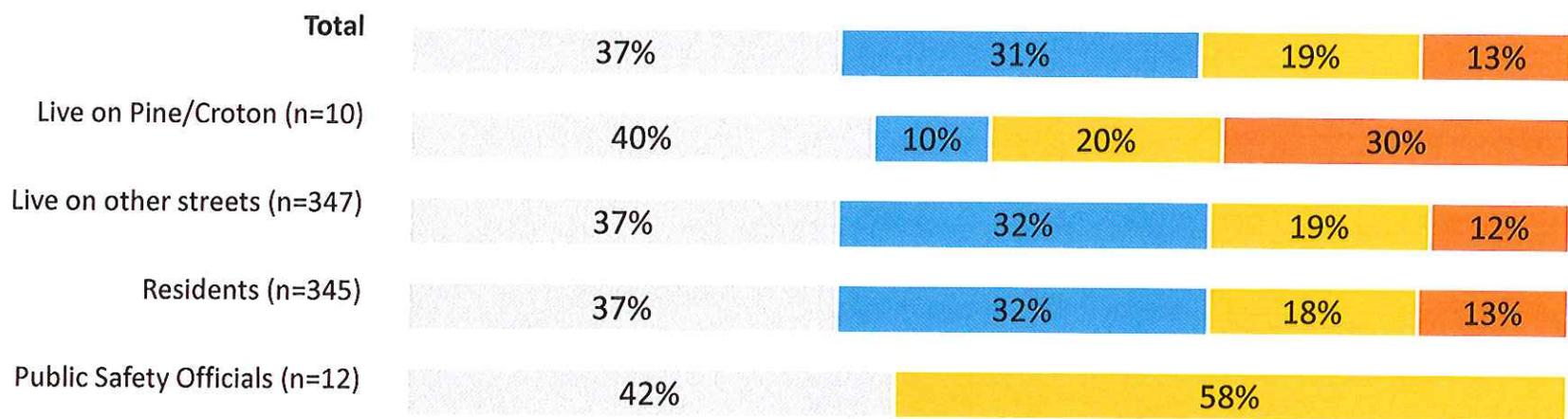


# Reasons for Preference Excerpts

White/2700 Kelvin (37%)	Blue/Current HPS (31%)	Yellow/3000 Kelvin (19%)	No Preference (13%)
<ul style="list-style-type: none"> <li>• Brightness is adequate for safety, but not too bright.</li> <li>• Warm light/softer and warmer</li> <li>• A bit brighter than current</li> <li>• Walking home from train station would be good and safe.</li> <li>• Right balance of brightness and tone.</li> <li>• Were the least of bad choices</li> <li>• Looks good!</li> <li>• Good overall visibility</li> </ul>	<ul style="list-style-type: none"> <li>• Closest to existing. Others too bright</li> <li>• Not as much glare when walking/driving</li> <li>• Amber warmth/warm glow that still illuminated but in a pleasant way</li> <li>• Weren't so shockingly bright</li> <li>• Provided adequate lighting but not too bright (concerned about brightness through windows)</li> <li>• The lighting was soft, but bright enough for adequate visibility</li> </ul>	<ul style="list-style-type: none"> <li>• Currently not enough light. Want it to be safe</li> <li>• Light spreads on the street better</li> <li>• Best brightness</li> <li>• Provides great visibility</li> <li>• Bright, clear</li> <li>• It's about safety and visibility</li> </ul>	<ul style="list-style-type: none"> <li>• None of the lighting was much of a change to bother us or make us happier</li> <li>• All the lights were not bright enough</li> <li>• I find all to be too bright</li> <li>• All the lights are acceptable</li> <li>• Hard to differentiate</li> </ul>

# Preferred Lighting – By Subgroups

- The White lights are preferred (or at least tied with Blue) among all of the resident subgroups; Public Safety officials prefer Yellow, then White (no officials prefer Blue).



## Most Important Benefit



■ Prefer White/2700 Kelvin

■ Prefer Yellow/3000 Kelvin

■ Prefer Blue/Current HPS

■ No preference

(cont'd)

# Preferred Lighting – By Subgroups (cont'd)

- The White lighting has a distinctive advantage over the others when viewed during rain, fog or misting.
- White is also relatively more preferred among those critical of the current streetlights, and those not solely using their headlights when evaluating the lights.

