

April 20, 2020

Mr. Matt Genova
Boston Region Metropolitan Planning Organization
10 Park Plaza, Suite 2150
Boston, MA 02116

Re: Comments submitted on Amendment 3 of FFYs 2020-2024 Transportation Improvement Program (TIP); PROJECT FILE # 608611: Replacement and Rehabilitation of the Highway Lighting System at the Interchange of Route 24 and I-93 – Canton-Milton-Randolph

Dear Mr. Genova:

We, the Friends of the Blue Hills, are grateful for the opportunity to comment on this project.

Project context and environmental background

This project would replace the existing highway lighting system at the Route 24 and I-93 highway interchange, which includes 87 modest-height poles along the roadway, with 10 taller, high-mast poles costing \$5,656,268. This highway interchange is located in the Blue Hills Reservation, within which there are protected *Natural Heritage and Endangered Species Program* priority habitats (herein ‘priority habitats’) to the North, East, and West of this interchange. Further, one of the ramps in this interchange falls within and is adjacent to the Fowl Meadow and Ponkapoag Bog, a state-designated *Area of Critical Environmental Concern* (ACEC). Skyglow (a.k.a. light pollution) is very harmful to the nocturnal ecosystems for species in these priority habitats. Said another way, dark skies are critical to these priority habitats.

Illuminating Engineering Society guidance

The Illuminating Engineering Society (IES) has created a scale of environmental sensitivity to lighting, from Lighting Zone 0 to Zone 5. The Blue Hills Reservation is a Zone 0, meaning the illuminance level in this area should not exceed 0.05 FC. The project design includes an illuminance level of 1.0 FC for the state right-of-way (ROW), 20 times greater than the recommended level for these priority habitats. The project includes light shields, however, this is a poor solution that does not fully mitigate light pollution.

It should also be pointed out that this section of the highway is already lit by high-pressure sodium lighting that has a correlated color temperature (CCT) of 2200K, which is environmentally quite benign because it emits virtually no blue light. The project will increase the color temperature to 4000K, producing twice as much light pollution as the current 2200K. The IES does not support high CCT lighting over low CCT lighting and states that low CCT has less environmental impact.

Insufficient justification for current project design

The reasons for this project stated by MassDOT is to improve the safety of automobiles that might run off and hit the poles and also converting to more energy-efficient LEDs. Yet, the need to increase lighting at this interchange has not been demonstrated. Analytical evidence of alternative safety measures, such as physical barriers protecting poles, is also lacking. While we agree that improving driver safety is always desired, the current project design will have a marginal increase in safety.

Protecting priority habitats from light pollution, lowering energy consumption, cost-effective solutions

Our concerns are that the current project design (1) produces too much light pollution that will negatively impact the priority habitats in this area, (2) will use too much energy, in fact increasing the wattage required to light this area, and (3) comes at too high of a fiscal cost given potential environmentally-friendly, cost-effective alternatives.

First, protecting these priority habitats within the Blue Hills from light pollution is of the utmost importance. As described above, the project design includes an illuminance level of 1.0 FC in the state-owned ROW. That translates to light pollution 20 times greater than the IES recommended 0.05 FC in these priority habitats. This far exceeds the dark sky recommended limits and will negatively impact the nocturnal habitats when this light trespasses on the priority habitats. It is worth repeating that the proposed inclusion of cut-off shields to reduce the impact of light spillage into the priority habitat areas both poorly mitigates light pollution and does not reduce energy consumption.

Second, the high-mast design would increase the wattage necessary as well as increase the CCT from 2200K to 4000K. In light of climate change and a commitment to decreasing energy consumption, all highway lighting replacement and rehabilitation projects should move to increase energy-efficiency. Yet, this design absolutely fails to do so.

Finally, the current design is estimated to cost \$5.7 million, yet it does not take advantage of technology or hybrid designs (i.e. a mixture of high-mast poles farther from environmentally sensitive areas and replacement of lighting fixtures on current standard poles with LEDs) that would direct lighting to the area most needed. The costs in this current design (i.e. damage to priority habitat, increased energy usage, and project cost) appear excessive and wasteful. It would be beneficial to compare the cost of this design to either (1) a design that utilizes the existing lighting infrastructure or (2) a hybrid design with fewer high-mast poles farther from the priority areas and using the existing lighting infrastructure.

We urge MassDOT to examine what the current existing environmental conditions are and identify the possible adverse effects on the priority habitat. We urge MassDOT to meaningfully investigate alternative designs (i.e. hybrid high-mast and current pole designs or retrofitting current poles with LEDs) to mitigate light pollution spillage into environmentally sensitive priority habitat areas. We also urge MassDOT to decrease the color temperature of the design to 3000K CCT or below, to lower the color temperature to a level more likely to mitigate the overall negative impact on these priority habitats. These suggested changes would also decrease the overall cost of the project. With our extremely limited highway financing, and with the current fiscal shortfalls we are facing, ensuring highway project spending efficiently meets its stated purposes is vital.

Thank you for working to improve highway safety, while also ensuring the species within these designated priority habitats area and Areas of Critical Environmental Concern are properly protected.

Sincerely,



Judy Lehrer Jacobs
Executive Director
The Friends of the Blue Hills

Cc: Senator Walter Timilty
Representative William Driscoll