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MEDIA RELEASE – May 1, 2018

U.S. Department of Transportation, Federal Highway Administration report highlights Ko-Solar’s Photovoltaic Noise Barriers (PVNBs) project in Massachusetts which is the first of its kind in the Western Hemisphere.

McLean, Virginia, USA – A report released by U.S. Department of Transportation, Federal Highway Administration on August 2017 features Ko-Solar’s retrofit highway solar sound barrier project in Lexington, Massachusetts, first of its kind, and explains how to use photovoltaic noise barriers (PVNBs) to lower noise levels while producing renewable energy.

The report indicates that highway photovoltaic noise barriers (PVNBs) or highway solar sound barriers represent the combination of noise barrier systems and photovoltaic systems to mitigate traffic noise while simultaneously producing renewable energy. First deployed in Switzerland in 1989, PVNBs are now found in several countries where transportation agencies have sought ways to find multiple uses of their infrastructure. The PVNB experience documented in literature and supplemented through a series of interviews provides evidence suggesting that noise barriers can be designed to produce renewable energy without compromising their abilities to reduce noise and do so safely. The business case for a PVNB often hinges on the availability of subsidies or other incentives that promote the renewable energy market. Although the first highway PVNB is yet to be constructed domestically, at least two State Departments of Transportation are currently working with partners to pursue PVNB pilots in the United States. Given the substantial extent of noise barriers in the country, the potential for solar energy production on American noise barriers is likely at least 400 Gigawatt hours annually, roughly equivalent to the annual electricity use of 37,000 homes, and perhaps much higher.

The report notes that in 2015, Ko-Solar and its partners approached MassDOT to discuss the concept of PVNBs. After two years of coordination and conceptual design work, MassDOT is now working to pilot a PVNB project along Interstate 95 in Lexington, MA. It informs that the project will be a retrofit of an existing noise barrier and will be financed through a public-private partnership and continues: “MassDOT plans to use the results of the pilot, including information about noise impacts, maintenance, cost, and community perception, to determine whether to make the pilot location permanent and whether to expand PVNB use elsewhere in the State. MassDOT considered 25 potential sites for the PVNB pilot, ultimately selecting the

Lexington site. The noise barrier, which is on the north side of the highway, is 3,000 feet (~915 m) long, 20 (~6 m) feet tall, and is constructed of reinforced concrete. A critical aspect of the pilot program is to monitor noise levels to understand whether, if at all, the PVNB affects the noise levels that abutters perceive or that occur on the other side of the highway. The racks of solar panels will be installed on the highway side of the barrier, while the side of the barrier facing abutters would not change significantly.”

The report further details “The exact size of the PV module system has not yet been determined, but MassDOT anticipates that if the full length of the noise barrier is used, approximately 825,000 kWh will be generated annually. This would be the equivalent of supplying 120 homes per year with electricity. MassDOT would not incur any capital costs. Although MassDOT is still working out the details of the partnership in the RFP, it is likely that the project would benefit MassDOT by allowing the agency to purchase the electricity at a guaranteed, long-term rate. The developer would likely receive credits under the Massachusetts solar renewable energy credit program or the new Solar Massachusetts Renewable Target (SMART) Program, a renewable energy tariff program. The developer would also likely receive a Federal Solar Investment Tax Credit, which is currently a 30 percent tax credit claimed against the tax liability of residential, commercial, and utility investors in solar energy property.

The report indicates that MassDOT solicited input on the project from abutters and other Lexington residents through letters to those living near the project site, a public meeting, and meetings with other stakeholders, such as Sustainable Lexington, a local advocacy group. Stakeholders raised several concerns before and during the public meeting, including potential changes to noise levels on both sides of the highway concerns by conducting a final noise analysis prior to the solar panel installation; if the analysis finds that negative noise effects are created, the project will not move forward. At the conclusion of the public meeting, MassDOT held a referendum for abutters to vote on the pilot project (abutters not at the meeting were also able to request a ballot). In accordance with noise barrier standards, a two thirds majority in support of the project was needed for it to move forward. Eleven votes were cast, all of which were in support of the pilot project.

The Federal Highway Administration report indicates that the pilot is expected to last two years from the date the solar panels are operational. MassDOT is developing evaluation criteria for the pilot project that it will use to evaluate whether to keep the site in operation after the two-year demonstration period, as well as whether to expand PVNBs to other locations in the State. The evaluation criteria have not yet been finalized, but will likely include changes to the noise abatement characteristics of the noise barrier, required maintenance of the solar panels, impacts to the longevity of the noise barrier, total costs, and community feedback. If the pilot project is successful, MassDOT may consider options for retrofitting other noise barriers with PV modules as well as piloting the PV integrated concept when a noise barrier(s) is constructed. This will also allow other states to consider applying solar sound barriers in their highways, consequently, increasing the use of solar energy in transportation areas reducing noise pollution and carbon from the atmosphere while generating funds for local and state agencies.

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