2016 AASHTO Right of Way, Utilities, Outdoor Advertising Control & National Alliance of Highway Beautification Agencies Conference

Sunday, May 1–Thursday, May 5
Rosen Centre Hotel
Orlando, Florida
MassDOT Highway ROW Solar PV Energy Program

Hongyan (Lily) Oliver  Ph.D.
Massachusetts Department of Transportation
Office of Transportation Planning

2016 AASHTO ROWUOAC & NAHBA Conference
Driving Forces for Renewable Energy

- Generate green power
- Leverage underutilized land
- Create energy savings
- Reduce GHG emissions

Reduce Your Carbon Footprint

2016 AASHTO ROWUOAC & NAHBA Conference
Massachusetts has an aggressive target of 1600 MW of solar power installed for 2020. The above figures represent the cumulative amount installed as of March 2016 in 43,930 projects.

*Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth*
Regulatory and Policy Environment

• State incentives:
  ▪ Solar Renewable Energy Credits (SRECs, 26 cents/kwh)
  ▪ Net metering policy (sell power back to the grid at retail price)
  ▪ Solar rebates and grants

• Federal incentives
  ▪ Federal Investment Tax Credit (ITC, 30%)
  ▪ Modified Accelerated Cost Recovery System (MACRS, 5-year property depreciation for tax base deduction)

• Interconnection standards (grid-connected)
Solar Photovoltaic Energy Generating facility
Demonstration Project

http://209.160.64.80/FSC/SRV/main.php?siteld=1628

J.F. White Contracting Co.
10 Burr St.
framingham ma, 01701
www.jfwhite.com

MassDOT
WWW.MASSDOT.STATE.MA.US

- 80 KW behind-the-meter system
- Supplies about 10% of power consumption at the D2 admin building.
- 8 ¢/kWh (PPA) vs. 15 ¢/kWh (WMECO)
Full Scale Roll Out

• Site Selection
  ▪ Consultant started with 600+ sites (desk top review) and visited 47 sites
  ▪ 16 sites went through MassDOT’s internal canvass process
  ▪ MassDOT sought FHWA’s approval of sites involving federal funds

• MassDOT Highway **Utility Accommodation Policy** was updated in May, 2013 to include renewable energy facilities

• MassDOT rolled out the full-scale program in July, 2013 with a RFR for the best-value proposal.
  ▪ Goal: a **minimum of 6 MW** aggregated solar PV generation capacity
  ▪ Awarded to Ameresco Inc. in June, 2014
  ▪ Contract executed in November, 2014
    o Master License Agreement / Power Purchase Agreement
    o Addenda for specific sites
Current Status

• Phase 1A (5 sites, 2.5 MW) completed in 2015 and in commercial generation

• Phase 1B (5 sites, 3 MW) ready to build pending utility upgrade schedule

• Phase 2 (3 sites, 1.7 MW) in development, pending contract execution, utility permit, and SREC incentives
Anticipated Outcomes for Phase I Sites

- 7,100 MWH per year
- 1,000 households
- 6.2 million lbs. of annual GHG emissions avoided
- 592 cars driven for a year
- 2,305 acres of U.S. forest
- Estimated $15 million savings over the 20-year contract period (in cash flow)
Public-Private Partnership

• The developer is required to: finance, develop, design, construct, commission, operate, maintain and decommission the solar facilities

• MassDOT provides the land, purchases 100% solar power, and obtains all net metering credits

• The developer receives all SRECs and tax incentives.
P3 Benefits to MassDOT

- Zero upfront capital cost
- Full utilization of federal tax incentives (30% ITC and 5-year MACRS)
- A favorable electricity rate schedule for 20 years
- Energy savings and rent revenues
Lessons Learned

- Agency support
  - Leadership support
  - Solar sponsor and champion
- Project team
  - Project leads (OTP and Highway)
  - Internal support: fiscal, legal, procurement, real estate, ROW, environmental and districts
  - Consultant
  - Developer
- External support/cooperation
  - Utility Interconnection
  - Municipal Permitting
- Timeline
  - Plan ahead
  - Be nimble – adjust to changes when necessary
Thank you!

MassDOT Highway ROW Solar project summary at
https://www.massdot.state.ma.us/GreenDOT/RenewableEnergy.aspx

Contact:

hongyan.oliver@state.ma.us; 857-368-9025
Site Selection Criteria

- Site physical characteristics:
  - Solar generation potential
  - Shading/trees
  - Topography
  - Existing drainage and underground utilities
- Distance to service drop (< 0.5 miles)
- Environmental concerns
- Access and safety
  - FHWA limited access guidance
  - Secondary road access preferred
  - Guardrail, setback space, and staging area
- Conflicting uses
- Visibility
Selected References on Renewable Energy Facilities in ROW

• Longitudinal Accommodation of Utilities in the Interstate System Right-of-way Purpose

• Alternative Uses of Highway Rights of Way, by VOLPE center for FHWA

• Solar Highway Program: From Concept to Reality, by the Good Company for Oregon DOT

• “An Array of Possibilities”, in Public Roads, September/October 2015