OPERATIONAL SERVICES DIVISION

SERVING PUBLIC BUYERS AND VENDORS OF THE COMMONWEALTH OF MASSACHUSETTS

Operational Services Division

NASPO Green Technical Assistant Grant to the Commonwealth of Massachusetts Operational Services Division (OSD)

Advancing Commercial Electric Battery Powered Lawn Equipment in Massachusetts

December 2018

Executive Summary

This report reviews two projects funded by the National Association of State Procurement Officials (NASPO) through the Green Purchasing Technical Assistance Funds (GPTAF). Both grants were provided to the Massachusetts Operational Services Divisions' (OSD) Environmentally Preferable Products Procurement Program (EPP Program) to assist with advancing commercial battery powered lawn equipment in the state. The grant was completed in two phases:

- 2017: Phase 1: Electric Powered Lawn Equipment Project
- 2018: Phase 2: Training and Technical Assistance for Commercial Battery Powered Electric Lawn Equipment

Summary

OSD used 2017 GPTAF to hire Quiet Communities[1] (QC) to assist with developing specifications for *commercial grade* battery powered landscape equipment (mowers, blowers, and other handhelds), so that OSD could add this equipment to the FAC88: Lawns & Grounds, Equipment, Parts, and Services statewide contract. These are the first "commercial grade" specifications for battery powered landscape equipment developed in the country, and serve as a model for other communities. This type of equipment has progressed significantly in the last few years, with new vendors entering the marketplace and major advances in battery power technology. QC joined the landscape equipment Sourcing Team, assisted with specification development and bid evaluation. As a result, four vendors were awarded to the contract in the spring of 2018.

QC also worked closely with the team to develop an economic and environmental modeling calculator that compares multi-year costs of electric battery powered lawn and garden equipment to gas powered counterparts with similar specifications and performance characteristics.

In 2018 OSD used GPTAF to again hire QC to assist with two "unbranded" full day technical assistance workshops, bringing together technical experts, buyers and vendors to explore environmental, health and cost issues. The day included a product demonstration with equipment from the awarded vendors and a short marketing video of the events was developed by the OSD Marketing, Communications and Events program: https://youtu.be/zBi42JfBRoQ. Over 100 buyers, vendors and experts participated in the workshops.

In addition, QC provided hands-on technical assistance to the Town of Lexington, the Department of Conservation and Recreation (including Walden Pond), the Department of Transportation's Mass Aeronautics Department, and the Massachusetts Association of Facility Management and Maintenance through the Department of Capital Asset Management and Maintenance.

Deliverables

- Commercial battery powered specifications for mowers, blowers and other handheld equipment
- Bid evaluation criteria
- Environmental and fiscal impact analysis tool
- Outreach materials
- Two full day trainings with workshops and product demonstrations
- Technical assistance to the Town of Lexington, the Department of Conservation and Recreation including Walden Pond, Mass Aeronautics, and the Department of Capital Asset Management and Maintenance.

[1] Quiet Communities is a Massachusetts-based 501(c)(3) organization, whose mission is to promote clean, sustainable, and quiet outdoor maintenance practices as the valued norm. The organization has worked with communities in Massachusetts (e.g., Brookline, Cambridge, Lexington, Lincoln, Newton, and Salem) and in other states across the country (e.g., Sonoma, CA; Southampton, NY; Washington, DC), providing education, resources and sustainable solutions.

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Overview

As Massachusetts advances the use of cleaner and renewable sources for electricity generation, we also seek new and innovative products that help reduce environmental and health impacts. The Commonwealth of Massachusetts' Environmentally Preferable Products Procurement Program (EPP Program), housed within the Operational Services Division[2], identified battery powered landscape equipment with multiple environmental, health and cost benefits compared to gasoline-powered equipment traditionally sold through statewide contract. They include:

Environmental benefits:

- Help the Commonwealth meet its environmental goals in climate change, clean air, and toxics use reduction
- Reduces carbon emissions, toxic exposure, air pollution, hazardous waste and spills
- Reduces noise pollution and nuisance complaints
- Reduces wildlife and habitat exposure to toxic emissions, excessive noise, and ground-sourced particulates
- Does not contribute to smog

Health benefits:

- Reduces worker exposures to toxic emissions, excessive noise, excessive vibrations, and ground-sourced particulates
- Reduces public exposure to toxic emissions, excessive noise, and ground-sourced particulates

Cost benefits:

- Avoids fuel costs
- Lowers maintenance costs
- The possibility for extended work hour options and holiday operation due to lower noise levels

Gas powered lawn and garden equipment accounts for substantial amounts of air pollution, noise and waste[3]. Transitioning to battery powered equipment may result in substantial reductions in emissions, noise, chemical and solid waste - benefitting the health of workers, the public, and the environment. In addition, markets for battery powered landscape equipment have progressed significantly in the last few years, with new vendors entering the marketplace and major advances in battery power equipment technology.

The EPP Program received two grants through the NASPO's GPTAF to provide contractor assistance for the Commercial Battery Powered Landscape Equipment Project. The project was conducted in two phases:

- **Phase 1 - Electric Powered Lawn Equipment Project**:

[2] OSD manages the state fleet of vehicles, the Commonwealth's COMMBUYS Procurement Market Center, certifies diverse businesses looking to do business with the Commonwealth, and provides management and oversight of the procurement of goods and services: www.mass.gov/osd

[3] Banks, National Emissions from Lawn and Garden Equipment, 2015: https://www.epa.gov/sites/production/files/2015-09/documents/banks.pdf

  - Develop contract specifications for Commercial Grade Battery Powered Lawn Equipment (mowers, blowers, and other handhelds)
  - Re-bid existing landscape equipment contract to add new category for commercial grade battery electric equipment
  - Develop evaluation criteria and awarded 4 vendors.
  - Develop an economic and environmental modeling calculator to help compare costs of electric battery powered lawn and garden equipment to gas powered counterparts with similar specifications and performance characteristics.
- **Phase 2- Training and Technical Assistance for Commercial Battery Powered Electric Lawn Equipment**:
  - Hold two "unbranded" full day technical assistance workshops to bring together technical experts, buyers and vendors, to explore environmental, health and economic issues and benefits of commercial grade battery powered landscape equipment.
  - Provided technical assistance to a number of public entities to help develop plans for transitioning to battery electric equipment.

See *Attachment A: Work plans for 2017/2018* for detailed work plans for the projects.

Phase I: Electric Powered Landscape Equipment Project

Specification Development, New Vendors and Equipment

FAC88: Lawns & Grounds, Equipment, Parts, and Services is the OSD's statewide contract for all landscaping equipment. The Sourcing Team for this contract - who develops the request for responses (RFR), all specifications, evaluates bids and awards vendors - developed a new sub-team to review the existing contract and recommend specifications for "commercial grade" high quality electric/battery powered equipment. The sub-team included QC and a representative from the Department of Energy Resources Leading by Example Program[4]. The existing contract offered some battery powered equipment within the categories, but it was unclear if this equipment met commercial grade requirements.

The sub-team developed mandatory and desirable specifications in the spring of 2017. The mandatory specifications included, but were not limited to:

- Equipment - certifications, power, construction and durability, noise, weight, run time, warranty, and evidence of functional reliability
- Batteries - certifications, chemistry, voltage, lifetime cycles, interchangeability between handhelds and backpacks, charge time, run time, damage protection, electric shock protection, water resistant, end of use cycle indicator, warranty.
- Education, training, service, customer support, and battery and equipment recycling/repurposing

Existing vendors on the contract were requested to submit products that met the new specifications for addition to the contract. Unfortunately, product submissions did not meet the requirements of the new

[4] LBE works collaboratively with state agencies and public colleges and universities to advance clean energy and sustainable practices that reduce the environmental impacts of state government operations. www.mass.gov/leading-by-example-program

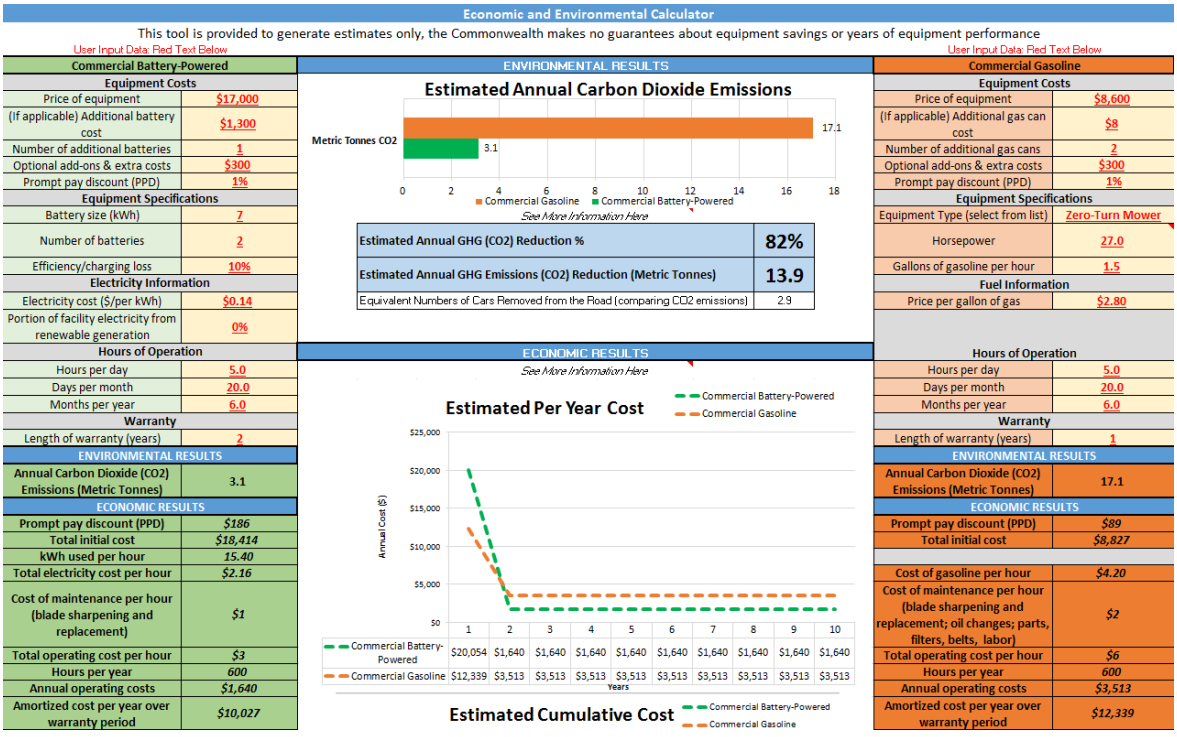
specifications and no equipment was added to the contract. One of the main reasons was a minimum two year warranty requirement for equipment and batteries that, at the time, could not be met.

The sourcing team re-opened the contract, and a new category was added to the RFR as *Category 13: Environmentally Preferable Products* for Commercial Grade Battery Powered Landscape Equipment. See *Appendix B: All Contract Documents* to view the RFR and specifications. The bid was posted in COMMBUYS, the Commonwealths online procurement and record keeping system, and announced in the OSD's monthly newsletter, *Buy The Way* (see *Attachment C: Marketing*). The evaluation criterion was developed and allowed all products that met the minimum mandatory specifications to be added to the contract. Six bids were received and four vendors were awarded contracts, resulting in the addition of 17 new pieces of equipment to the contract. See *Appendix B: All Contract Documents* for links to the master price sheet listing all of the accepted equipment and a summary of their specifications.

The Sourcing Team was pleased that four vendors were able to meet the specifications, especially the two year warranty requirement on all equipment and batteries. One vendor was not awarded a contract because they could not offer this length of warranty. Subsequently we have learned that they have made changes since the bid, and will now be offering a two year warranty. Often environmentally preferable products new to the marketplace need additional strategies to draw buyers, and extending a warranty is a way the state can use its purchasing power to test the marketplace.

Environmental and Economic Tool

The sub-group developed a excel spreadsheet tool to assist buyers in analyzing the environmental and fiscal impacts (or return on investment) of transitioning to battery powered equipment from the gas counterparts. Users are required to input applicable cost, equipment, and operational data for the battery powered equipment in addition to the gasoline equipment equivalent. The graphs and data



Economic and Environmental Calculator

This tool is provided to generate estimates only, the Commonwealth makes no guarantees about equipment savings or years of equipment performance

User Input Data: Red Text Below

Commercial Battery-Powered	
Equipment Costs	
Price of equipment	$17,000
(If applicable) Additional battery cost	$1,300
Number of additional batteries	1
Optional add-ons & extra costs	$300
Prompt pay discount (PPD)	1%
Equipment Specifications	
Battery size (kWh)	7
Number of batteries	2
Efficiency/charging loss	10%
Electricity Information	
Electricity cost ($/per kWh)	$0.14
Portion of facility electricity from renewable generation	0%
Hours of Operation	
Hours per day	5.0
Days per month	20.0
Months per year	6.0
Warranty	
Length of warranty (years)	2
ENVIRONMENTAL RESULTS	
Annual Carbon Dioxide (CO2) Emissions (Metric Tonnes)	3.1
ECONOMIC RESULTS	
Prompt pay discount (PPD)	$186
Total initial cost	$18,414
kWh used per hour	15.40
Total electricity cost per hour	$2.16
Cost of maintenance per hour (blade sharpening and replacement)	$1
Total operating cost per hour	$3
Hours per year	600
Annual operating costs	$1,640
Amortized cost per year over warranty period	$10,027

ENVIRONMENTAL RESULTS

Estimated Annual Carbon Dioxide Emissions

See More Information Here

Estimated Annual GHG (CO2) Reduction %	82%
Estimated Annual GHG Emissions (CO2) Reduction (Metric Tonnes)	13.9
Equivalent Numbers of Cars Removed from the Road (comparing CO2 emissions)	2.9

ECONOMIC RESULTS

See More Information Here

Estimated Per Year Cost

	1	2	3	4	5	6	7	8	9	10
Commercial Battery-Powered	$20,054	$1,640	$1,640	$1,640	$1,640	$1,640	$1,640	$1,640	$1,640	$1,640
Commercial Gasoline	$12,339	$3,513	$3,513	$3,513	$3,513	$3,513	$3,513	$3,513	$3,513	$3,513

Estimated Cumulative Cost

User Input Data: Red Text Below

Commercial Gasoline	
Equipment Costs	
Price of equipment	$8,600
(If applicable) Additional gas can cost	$8
Number of additional gas cans	2
Optional add-ons & extra costs	$300
Prompt pay discount (PPD)	1%
Equipment Specifications	
Equipment Type (select from list)	Zero-Turn Mower
Horsepower	27.0
Gallons of gasoline per hour	1.5
Fuel Information	
Price per gallon of gas	$2.80
Hours of Operation	
Hours per day	5.0
Days per month	20.0
Months per year	6.0
Warranty	
Length of warranty (years)	1
ENVIRONMENTAL RESULTS	
Annual Carbon Dioxide (CO2) Emissions (Metric Tonnes)	17.1
ECONOMIC RESULTS	
Prompt pay discount (PPD)	$89
Total initial cost	$8,827
Cost of gasoline per hour	$4.20
Cost of maintenance per hour (blade sharpening and replacement; oil changes; parts, filters, belts, labor)	$2
Total operating cost per hour	$6
Hours per year	600
Annual operating costs	$3,513
Amortized cost per year over warranty period	$12,339

results update automatically based on the user input. Note that this tool is provided to generate ***estimates only***, and the Commonwealth makes no guarantees about equipment savings or years of equipment performance.

The Appendix Tab in the tool lists all of the reference data which the calculations are based on. If a user makes adjustments to the reference data (e.g. cost of electricity or gasoline), all calculations are updated automatically in the tool based on those adjustments. For example, if the frequency of hours of mowing is reduced from 880 hours per year to 440 hours per year, the maintenance cost per hour would automatically recalculate, and any of the calculations in the tool that are based on the average maintenance cost would be adjusted automatically. This allows the user to tweak any of reference data based on actual use.

Emissions information for electricity is calculated using Massachusetts-specific grid electricity carbon dioxide factors (from MassDEP dataset[5]). The emissions information for gasoline-powered equipment is calculated using EPA's *Exhaust Emission Factors for Nonroad Engine Modeling – Spark-Ignition* carbon dioxide factors.

To view the actual tool visit the link located *Appendix B: All Contract Documents* to the Master Blanket Purchase Order for FAC88 in COMMBUYS, and choose the Economic and Environmental Calculator.

Phase 2: Training and Technical Assistance for Commercial Battery Powered Electric Lawn Equipment

Trainings

Quiet Communities worked with the OSD to put on two "unbranded" trainings with equipment available from the awarded vendors for participants to try. The trainings were designed to bring together technical experts, buyers and vendors to explore environmental, health and cost issues associated with transitioning to battery powered equipment, and to give participants an appreciation of the quality and viability of these options, together with facts and resources to help them make informed buying decisions on behalf of their organizations. See *Attachment D: Agenda and Presentations for Commercial-Grade, Zero-Emission Landscaping Equipment Learning Sessions* to view the agendas and links to the presentation slides.

The panel and breakout sessions were designed to provide an in-depth understanding of the new technologies, give first-hand access to organizations that have led by example, and details of the transition process. The environmental and economic tool was demonstrated, providing an example of calculating long-term savings with one of the sustainable alternatives, as well as environmental impacts associated with their use.

Close to 100 people participated in the workshops:

- September 26th: Town of Lexington (67 registered, 54 attended)
- September 27th: Tower Hill Botanical Garden (54 registered, 40 attended)

[5] MassDEP Dataset: https://www.mass.gov/files/documents/2017/12/05/Current%20LBE%20Conversions%20GHG.xlsx

Outreach was done through the OSD's monthly newsletter *Buy The Way*, through email invitation using Constant Contact and individual emails to select entities and attaching the event flyer for consistent marketing (*see Appendix C: Marketing).* In addition, QC reached out to many of their constituents.

OSD also completed a promotional video using footage from the workshops which provides an overview of the benefits of using the new equipment and footage of the equipment demonstrations. The video may be viewed on the OSD YouTube Channel at https://youtu.be/zBi42JfBRoQ.

OSD has many contacts with procurement staff throughout all public agencies in MA, but contacts with staff that uses this type of equipment is not robust. Getting the message to this segment of staff was a challenge. Those that did participate represented many public agencies, colleges and universities throughout the state.

Technical Assistance

Electric battery powered equipment technology differs in important ways from gas-powered internal combustion technology. Education and training on electric battery equipment can help land care professionals attain comparable productivity to gas equipment safely and efficiently. This includes different operation, handling, storage, and maintenance issues, in addition to right sizing the equipment for the operational needs. QC provided the following technical assistance to help each of these public entities move their program to the next level:

- **Town of Lexington**: Lexington hosted the first training and was able to send 7 of their staff to participate. QC is working with the Town to develop a strategy to implement battery powered landscape equipment town-wide, and to explore designating parts of the Town as "green zones" through the American Green Zone Alliance (AGZA)[6]. This would be the first MA community designated with as AGZA certification.
- **The Department of Conservation and Recreation (DCR):**
    - Walden Pond: QC completed a gas equipment inventory impact analysis (see Appendix E: Walden Pond Impact Analysis) which identified six pieces of equipment generating:
        - 211 lbs/year of non-methane hydrocarbons (e.g., including benzene, 1,3 butadiene, formaldehyde, acetaldehyde)
        - 51 lbs/year of nitrogen oxides
        - 5,672 lbs/year of carbon monoxide
        - 26 lbs of fine particulate matter (2.5 micron diameter or less)
        - 17,300 lbs/year of the greenhouse gas, carbon dioxide.

      Just replacing the large mower with a ride-on battery counterpart would provide the following reductions:
        - 29% of hydrocarbons
        - 91% of nitrogen oxides
        - 82% of carbon monoxide
        - 3% of fine particulates
        - 80% of carbon dioxide

[6] The American Green Zone Alliance (AGZA) is a third party that certifies and accredits quieter zero-emission sustainable grounds maintenance strategies. They provide certification and accreditation of "green zones", staff and equipment that meets zero emissions and low noise criterion. www.agza.net

In addition, a list of equipment from the statewide contract was recommended for purchase.

- QC will be presenting to the DCR's Statewide Health & Safety Committee meeting in December, 2018 on health and safety issues with noise, emissions, vibration, hazardous materials, accidents and injuries associated with gas equipment, and how battery powered equipment is a viable technology solution. We will continue to explore next steps with DCR.

- **Department of Transportation's Mass Aeronautics Division (DOT)**: The DOT's Mass Aeronautics Division provides funding and assistance to municipal airports throughout MA. QC met with DOT to assist with writing a scope of work to purchase blowers and other handheld battery powered landscape equipment for up to 6 airports, and to provide technical assistance.
- **The Division of Capital Asset Management and Maintenance (DCAMM)** run a network of state facilities personnel called the Massachusetts Facilities Management Association (MAFMA), who was represented at the workshops. QC provided equipment recommendations to add to MAFMA's Tool Barn program. This program lends out a variety of tools and equipment to agencies that would like to try before they buy or only need periodically.

Conclusion

The NASPO Green TA funding has enabled Massachusetts to explore and develop a program to help public entities transition from gas powered landscape equipment to a viable technology solution using electric powered landscape equipment. New "commercial grade" specifications were developed, laying a foundation for requirements needed for this type of equipment, education and technical assistance. An environmental and economic Tool was developed to assist buyers in analyzing the environmental and fiscal impacts (or return on investment) of transitioning to battery powered equipment from the gas counterparts – a tool helpful for decision-makers in addition for those interested in collecting metrics.

Two trainings, bringing together technical experts, buyers and vendors provided over 100 entities reviewed issues on the alternatives to gas-powered equipment which offer many health and environmental attributes, meet strict construction and durability requirements, and provide long-term savings opportunities.

The technical assistance component of this grant has been imperative to provide hands-on assistance to the early adopters, or champions, who will demonstrate that this type of program can work in their facility/community. It also allows us to identify the most efficient ways to roll out an effective program. As we put together the agenda for the trainings, we learned of many other public entities in MA who have initiated programs, such as UMass Amherst and the City of Cambridge, enlarging our network of public entities using this type of equipment.

We will continue to work with other public programs as we are able, to advance the use of this equipment, and to explore funding for equipment purchases to help offset any increased up-front costs of this new technology – even though the Tool shows significant return on investment over the years. In the next few years, the OSD contract for landscape equipment will be re-bid, allowing MA to further refine and add more vendors to the contract. We are also exploring requirements for other contracts, such as the landscape services contract, to include service providers that use this type of equipment.

ATTACHMENT A: Work plans for 2017/2018

Tasks	Description of Activities/Deliverables
PHASE I	
Develop specifications, evaluation criteria, and input form for vendors for high quality electric/battery powered equipment	• Using the draft specifications developed by Quiet Communities last fall, QC to meet with OSD to review and edit specifications. Specifications include battery type, equipment features, training and educating of workers and management on the proper operation, handling, charging, and storage of the equipment. OSD will take recommendations from meeting and develop final criteria. • QC to work with OSD to develop evaluation criteria based on the specifications. The evaluation criteria will be used to evaluate bids submitted by vendors. OSD will take recommendations and develop evaluation criteria. • QC to work with OSD to develop bidder response form for specification response in addition to product pricing. OSD will take recommendations and develop a bidder response form. Estimated hours: 20 (Complete by July, 2017)
Develop evaluation criteria for bid review	• QC will assist with bid and product pricing review from existing vendors • QC to work with OSD to determine if submittals meet our needs • (if it is determined that the submittals by existing vendors do not meet our needs, OSD will need to receive permission to open contract with new category for Battery Powered/Electric equipment which would allow new vendors to bid. This will add time, and additional evaluation time) Estimated hours: 8 (add another 8 hours if need to bid out) (Complete by August, 2017 (or December if need to re-bid))
Develop a template for environmental and fiscal impact analyses for OSD and the Leading By Example Program (LBE) to help establish a return on investment (ROI) from switching to electric/battery powered mowers	• QC work with OSD and LBE to identify important environmental and fiscal impacts to be included in an impact analysis. • QC to assist in analyzing existing vendor reported data to pull selected agency usage information to include in a ROI. • QC to develop impact analysis and present to OSD and LBE. QC will edit based on comments. Estimated hours: 25 (Complete by July, 2017)
Develop outreach information for public agencies/ municipalities	• QC to provide OSD copy for outreach and marketing materials to state agencies and municipalities • QC to review and provide edits to draft materials Estimated hours: 8 (if contract needs to be opened, funding for this section will be used for bid reviews) (Complete by August 31, 2016)
(If budget allows) Provide technical assistance to one or more executive agencies	• Meet with Agency(ies) to identify needs and possible equipment on contract that meets their needs If budget allows due to expedited work on previous sections, TBD
Final Report	• QC to review and comment on outline for final report developed by OSD • QC to review and edit final report Estimated hours: 5.5
PHASE II	
OSD would lead team of QC and EEA to put on two unbranded trainings – one for Executive Agencies and the other for other eligible entities	• OSD to convene Phase II Battery Powered Electric Lawn Equipment outreach and training team to discuss dates and agenda for trainings. • QC will assist in identifying locations, writing copy for marketing materials, developing agenda for trainings, identifying speakers and trainers, and may assist with some of the logistics, in addition to participating in both events. Estimated hours: 66.7 (completion date September in 2018)
Provide technical assistance to one or more executive agencies	• Meet with interested buyers (who may purchase from statewide contracts) to identify needs and possible equipment on contract that meets their needs. The technical assistance would include, but not be limited to; a site visit, program right sizing and help determining the right types of equipment, learning about the statewide contract, and if needed assistance in crafting the business/environmental case to management and either facilitating or providing 2 hour training to staff. In addition, a few hours will be designated for QC to review and edit a final report. • Estimated hours: 66.7 hours (completion date December 2018)

ATTACHMENT B: All Contract Documents

All FAC88: Lawns & Grounds, Equipment, Parts, and Services contract documents may be found in COMMBUYS, the Commonwealth's online procurement and record center. Use the following link to access the Master Blanket Purchase Order for the statewide contract FAC88: Lawns and Grounds Equipment, Parts and Services:

https://www.commbuys.com/bso/external/purchaseorder/poSummary.sdo?docId=PO-15-1080-OSD01-OSD10-00000003434&releaseNbr=0&parentUrl=contract

In the "agency attachments" section the following documents may be found:

Request for Responses (RFR):

- FAC88 RFR battery power revision 2-20-18.pdf

Specifications:

- FAC88 Specifications Commercial Electric Lawns and Grounds Equipment 2 20 18~1.docx
- FAC88 MOWERS and HAND HELD BATTERY POWERED MINIMUM SPECS 5-7-18.xlsx
- FAC88 Performance Specifications and Requirements

Vendor Contact Information:

- FAC88 Vendor Contact Information 6-1-18~4.xlsx

Category 13: Battery Powered Landscape Equipment Price List:

- FAC88 Cat 13 Battery Powered PRICE SHEET Master 9 25 18.xlsx

Environmental and Economic Modeling Tool:

- FAC88 ECONOMIC AND ENVIRONMENTAL CALCULATOR 9.25.18 (2).xlsx

ATTACHMENT C: Marketing

- **OSD Commercial Battery Powered Lawn Equipment Training Announcement (see to the right)**
- **OSD marketing video for commercial battery powered landscape equipment compiled from videos and pictures from the two workshops. The video was compiled by the Marketing, Communications and Events interns in the winter of 2018:** https://youtu.be/zBi42JfBRoQ

- **OSD's *Buy The Way* Newsletter announcements, including bidding opportunity, training opportunity, and results of trainings – scroll to view an links also provided where available:**
  - Buy The Way, February 2018: Vendors Needed!
  - Buy The Way, May 2018: New Commercial Grade Landscaping Equipment Addresses Environment, Preserves Quality
  - Buy The Way, August 2018: Commercial-Grade, Zero-Emission Landscaping Equipment on Statewide Contract
  - Buy The Way, September 2018: OSD To Host Three Educational Sessions
  - Buy The Way, October 2018: Advancing Commercial Battery Lawn Equipment in Massachusetts

Buy the Way

In This Issue

Official Newsletter of the Operational Services Division
February 2018

Vendors Needed!

The Operational Services Division's (OSD's) Strategic Sourcing Services unit, in conjunction with public purchasers around the Commonwealth, identifies statewide needs for goods and services and develops Statewide Contracts that satisfy those requirements. Of course, integral to fulfilling these needs is attracting vendors able to provide wide-ranging commodities and services. Vendors should take note that, with the Commonwealth of Massachusetts spending more than $1 billion on goods and services available on Statewide Contracts each year, it's worth investigating whether the state is seeking services offered by your business.

There's no mystery to staying on top of the state's future purchasing plans. Each month the Operational Services Division publishes the OSD Procurement Schedule summarizing its future procurements, including impending contract expiration dates and renewals, intentions to rebid contracts, and new goods and services opportunities.

The Commonwealth's purchasing and procurement portal, COMMBUYS, provides an open and transparent display of current and imminent Statewide Contract bid opportunities, as well as bids for other organizations, such as municipalities. Establishing a vendor profile in COMMBUYS streamlines the process for identifying relevant bids: specify the products and services your business provides and we'll notify *you* about matching opportunities. Get more information about COMMBUYS registration.

As you might expect, our needs continuously evolve, but here's a look at some of OSD's current Statewide Contract procurement activities:

- Four Trades Contracts covering 27 categories – TRD01, TRD02, TRD03, TRD04;
- New GRO36 Contract for Dairy Products;
- Reopening of Purchase of Vehicles Contract VEH98, seeking fire trucks, ambulances, buses, and additional trucks;
- Partial Reopening of FAC82 covering Hazardous/Medical Waste;
- Partial Reopening of FAC88 to provide battery-powered lawn equipment;
- Intent to Post ITC70 bid for Operational Term IT Leasing;
- Intent to Post FAC98 bid for Floorcovering, Accessories, Installation, Maintenance & Repairs.

If you have questions about searching for opportunities, getting registered in COMMBUYS, or signing up for free training to learn about doing business with the state, contact the COMMBUYS Help Desk at 888-MA-State (627-8283).

OPERATIONAL SERVICES DIVISION

STATEWIDE CONTRACT UPDATES | MAY 2018

New Commercial Grade Landscaping Equipment Addresses Environment, Preserves Quality

OSD recently added commercial grade battery/electric lawn equipment (Category 13) to the FAC88 Lawns and Grounds Statewide Contract, seeking to reduce the negative environmental, health, and cost impacts of gas-powered commercial mowers, blowers, and other handheld landscaping equipment in the Commonwealth.

Commercial Grade Battery/ Electric Lawn Equipment
Zero Toxic Emissions
Zero Greenhouse Gases
50% Less Noise
No Fuel Spillage
No Fuel Cost
Less Maintenance
No Soil and Water Pollution

OSD has worked closely with Quiet Communities (QC) to advance its environmentally preferable purchasing efforts. QC is an independent non-profit organization that helps neighborhoods and businesses shift to zero emission landscaping equipment and advocates for curtailing the noise associated with traditional landscaping equipment.

This joint effort has resulted in the development of first-in-the-nation specifications for commercial-grade, battery powered/electric lawns and grounds equipment. These specifications not only address environmental, health, and cost benefits (reduction in carbon emission, noise pollution, avoided fuel costs/hazardous waste spills), but also identify strict equipment quality requirements, emphasizing commercial-grade power, rugged construction and durability, certifications, run time, and warranties, among other standards.

OSD is pleased to welcome four vendors that have been awarded contracts for Category 13:

- Boston Lawnmower
- Casons
- Mean Green
- Orlando's Garage DBA Ultra Automotive Inc.

Find additional Category 13 details in the FAC88 Contract User Guide.

Buyer Training
Category 13 alternatives may be new to many buyers and OSD will be working with Quiet Communities to conduct Executive Agency and municipal training sessions, including product demonstrations, in late summer/early autumn. These sessions will familiarize buyers with the use of Category 13 equipment and make available an environmental calculator to quantify Category 13 equipment cost savings and process efficiencies. Stay tuned for additional information.

Contact Gayle Gionet, FAC88 Contract Manager, at 617-720-3381.

Green Technology Choices Acknowledged by GEC

During the fourth annual EPEAT Purchaser Awards on May 14, 2018, the Commonwealth of Massachusetts was acknowledged for its work to incorporate greener electronics choices into Statewide Contracts. EPEAT, the Electronic Product Environmental Assessment Tool, managed by the Green Electronics Council (GEC), verifies that electrical products meet multi-attribute environmental performance standards, minimizing their impact on the planet.

The Commonwealth earned a Two-Star Award for its commitment to sustainable purchasing in two IT product categories – PCs and Displays and Imaging Equipment – alongside other EPEAT winners that include national and local governments, schools, and businesses.

Read more about the 2018 EPEAT Purchaser Awards. Learn about OSD's EPP Procurement Program at mass.gov/epp.

OPERATIONAL SERVICES DIVISION

STATEWIDE CONTRACT UPDATES | SEPTEMBER 2018

Opportunity to Bid on Trades Contracts Extended

To accommodate additional vendors being added to the TRD02, TRD03, and TRD04 contracts, the Sourcing Teams have extended the open enrollment periods as follows:

- TRD02 through October 31, 2018, at 3:00 p.m.
- TRD03 through November 30, 2018, at 3:00 p.m.
- TRD04 through October 31, 2018, at 3:00 p.m.

Note that the TRD01 bid currently is closed; however, the Sourcing Team intends to reopen the bid later this year. Check COMMBUYS for updates.

Buyers

Refer your vendors to mass.gov/trades.
View our current contractors in the Trades Index.
Send questions to COMMBUYS@mass.gov.

Trades Contract Categories

TRD01: Boiler; Drain; Electrical; Fencing; General Contracting; Generator/Turbines; Glass/Window/Doors; HVAC/Sheet Metal; Painting; Plumbing

TRD02: Asphalt Paving; Carpentry; Excavation; Masonry; Septic

TRD03: Elevator; Exhaust Systems; Fire Prevention; Fire Suppression; Overhead Doors; Signage; Welding

TRD04: Cleaning Restoration; Compressor Services; Kitchen Exhaust/Duct; Pump & Motor; Roofing

OSD to Host Three Educational Sessions — Don't Miss These Events!

Over the next few weeks, OSD will host educational sessions focused on fleet offerings and landscaping equipment. We invite you to attend and to share these opportunities with staff and colleagues. Contact Susan Aalpoel, OSD Events Manager, at 617-720-3149 with questions.

State Fall Fleet Event 2018

Attend the Third Annual State Fall Fleet Event, focusing on electric vehicles, associated infrastructure, and after-market technologies, as well as the extensive expansion of the VEH98 Purchase of Vehicles Statewide Contract. VEH98 possibilities include school buses, garbage trucks, wheelchair accessible vans, hydroseeders, and more.

Please join us in thanking the National Association of State Procurement Officials (NASPO) ValuePoint for sponsoring this event. We also thank the following vendors for graciously sponsoring Breakfast and Lunch for all: Anderson Blue Bird Bus Sales; Central Dodge, Inc.; Dario Diesel Service, Inc.; Genuine Parts Company/NAPA Auto Parts; GPS Insight; JN Phillips Auto Glass; and Osterman Propane.

Link to the flyer.

Sturbridge Host Hotel, Sturbridge
Wednesday, October 3, 2018
9:00 a.m. – 3:00 p.m.
Register

Commercial-Grade, Zero-Emission Landscaping Equipment

Learn about commercial-grade, zero-emission landscaping equipment on Statewide Contract. Get an appreciation of the quality and viability of these gas-powered equipment alternatives. Try the equipment and obtain resources to calculate long-term savings.

These events are funded by the National Association of State Procurement Officials (NASPO) Green Purchasing Technical Assistance Funds (GPTAF). We extend our thanks to NASPO GPTAF for its continued support.

Link to the flyer with agenda.

Cary Memorial Building, Lexington
Wednesday, September 26, 2018
9:00 a.m. – 3:30 p.m.
Register

Tower Hill Botanic Gardens, Boylston
Thursday, September 27, 2018
9:00 a.m. – 3:30 p.m.
Register

Latest COMMBUYS Enhancements

Drawing on valuable feedback from our user community, the COMMBUYS Operations Team at OSD has implemented a number of enhancements to the COMMBUYS system:

Buyers

- New Confidential column on the Attachments tab of a bid, making the process to designate a document as confidential more straightforward. View our *Confidential Attachments in COMMBUYS* article that provides further enhancement details and several confidential document reminders.
- Enhancement that reduces the risk of buyers accidentally selecting all vendors for bid notification. Buyers will be prompted to select at least one search parameter to narrow the selection of vendors to be notified.
- On a Distributor model Master Blanket, reinstated ability to inactivate one or more vendors through a Change Order.
- Corrected the issue that was clearing the Informal checkbox on Rolling Enrollment bids (formerly occurring when this designation was selected in advance of the organization's Department and Location).
- Reestablished the ability to conduct a PO search by Fiscal Year or Vendor ID.

Vendors

- Corrected a display issue affecting logged in vendors whereby attachments visible from the Attachments tab were not displaying on the Summary tab.

We look forward to your continued feedback and refining the COMMBUYS portal to meet the needs of our buyer and vendor communities. Contact the COMMBUYS Help Desk if you have a question: 888-MA-State (627-8283) or COMMBUYS@mass.gov.

OSD Program Earns National Recognition

The Operational Services Division's Local Government Enablement (LGE) team recently was recognized for its innovative programs supporting municipal procurement at the 2018 National Association of State Procurement Officials' (NASPO) Annual Conference in Long Beach, California.

LGE Account Manager, Patricia Burke, accepted the Silver Cronin Award for Procurement Excellence on behalf of the team, telling the crowd, "We first earned the trust of municipal procurement staff by listening to their challenges, then we were able to work with them to identify ways Statewide Contracts and COMMBUYS could address those challenges. Collaborating with municipalities to successfully transform purchasing practices from paper-driven to digital procurement was game changing and inspiring."

If you would like to learn about incorporating COMMBUYS and Statewide Contracts into your municipal procurement process, please contact the LGE team at COMMBUYSEnablement@mass.gov.

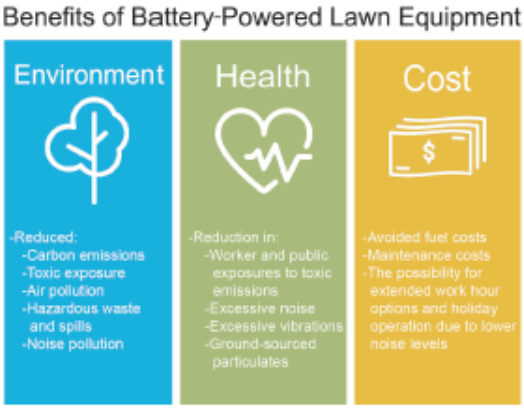
OSD staff accept the Silver Cronin Award. Pictured from left, William McAvoy, Deputy Assistant Secretary; Patricia Burke, LGE Account Manager; Gary Lambert, Assistant Secretary; and Kathy Reilly, Deputy Assistant Secretary.

Advancing Commercial Battery-Powered Lawn Equipment in MA

"I'm proud to say that Massachusetts is the first state to develop commercial grade specifications for battery-powered lawn equipment – and with your help we can implement successful programs around the state," declared Julia Wolfe, Director of OSD's Environmentally Preferable Products (EPP) program, as she welcomed attendees to the first of two events designed to educate buyers on the use of this equipment.

Attendees from executive agencies, municipalities, and non-profits learned about the environmental, health, and cost benefits of transitioning from gas-powered to electric lawn equipment for routine grounds maintenance. Later in the day, participants had the opportunity to demo the equipment outdoors where battery-powered equipment such as chain saws, push mowers, hedge trimmers, and a commercial-grade, battery-powered ride-on mower were available for evaluation.

To learn more about the EPP program, please visit mass.gov.



ATTACHMENT D: Agenda and Presentations for Commercial-Grade, Zero-Emission Landscaping Equipment Learning Sessions

- **Agenda for Lexington Learning Session**

Welcome to the

Commercial-Grade, Zero-Emission Landscaping Equipment Learning Session

Isaac Harris Cary Memorial Building
Battin Memorial Hall
Lexington, MA

Wednesday, September 26, 2018
9:00 a.m. – 3:30 p.m.

September 26, 2018

Welcome to Battin Memorial Hall and a day devoted to learning about the advantages of commercial-grade, zero-emission landscaping equipment, now on Statewide Contract! These alternatives to gas-powered equipment offer many health and environmental attributes, meet strict construction and durability requirements, and provide long-term savings opportunities.

Quiet Communities and the Operational Services Division has planned a comprehensive agenda to give participants an appreciation of the quality and viability of these options, together with facts and resources to help you make informed buying decisions on behalf of your organization. We are excited to spend the day with you!

Our panel and breakout sessions will provide an in-depth understanding of the new technologies, give first-hand access to organizations that have led by example, and detail the transition process. Among other resources, you will learn how to calculate long-term savings when opting for these sustainable alternatives, as well as environmental impacts associated with their use.

Additionally, later today be sure to take the opportunity to try out electric battery equipment on Statewide Contract and speak with Statewide Contract Vendors.

Today's event is made possible by the National Association of State Procurement Officials (NASPO) Green Purchasing Technical Assistance Funds (GPTAF). NASPO GPTAF seeks to leverage the purchasing power of state government to conserve energy and national resources, limit environmental pollution and waste, improve public health, encourage clean technologies, and create cost savings opportunities and a balanced economy. We express our sincere thanks to NASPO and the Town of Lexington for graciously providing their venue to host our event. Thank you, too, for taking time out of your busy schedule to join us today!

Sincerely,

Maureen Barends
Director of Strategic Sourcing Services

OSD
OPERATIONAL SERVICES DIVISION

Agenda

8:30 a.m. – 9:30 a.m.	**Registration, Coffee, and Continental Breakfast**
9:30 a.m. – 9:45 a.m.	**Opening Remarks** ***Speakers:*** Joe Pato, Town of Lexington, Board of Selectmen; and Julia Wolfe, MA Operational Services Division
9:45 a.m. – 10:30 a.m.	**Gas-Powered Landscape Maintenance Practices — A Growing Concern** Landscape maintenance practices depend heavily on gasoline. Concerns are growing about the impact of noise, emissions, and waste noise, as well as the health of workers, the public, and the environment. This presentation will discuss the impacts, concerns, and benefits of alternative solutions. ***Speakers:*** Jamie Banks, Quiet Communities; Daniel Fink, The Quiet Coalition; and Lucy Weinstein, Committee on Environmental Health, American Academy of Pediatrics, Ch 2
10:30 a.m. – 10:45 a.m.	**Break**
10:45 a.m. – 11:30 a.m.	**The Promise of Electric Technology** Electric battery technology is advancing, enabling communities to create low noise, emissions-free parks, campuses, and other spaces. At this point, the technology is practical and cost-effective to use for a substantial amount of commercial scale work. This panel will discuss where the technology is today, the economics and ROI considerations, and where things are heading. ***Speaker:*** Dan Mabe, American Green Zone Alliance
11:30 a.m. – 12:00 noon	**Leading By Example** A growing group of state agencies, municipalities, schools, businesses, and even golf courses(!) are taking bold steps to transition away from gas-powered landscape maintenance for reasons of health, environmental quality, sustainability, and quality of life. This session will present the ways in which these players are leading by example in their regions and the nation and provide information on what you can do to get ready for Spring 2019. ***Moderator:*** Trey Gowdy, Leading by Example ***Panelists:*** Dan Delventhal, MowGreen Lawn Care; David Pinsonneault, Town of Lexington; Christine Scalera, Town of Southampton, NY; and David Webster, City of Cambridge
12:00 noon – 12:15 p.m.	**Introduction to Vendors and Equipment** Boston Lawnmower Company, Inc.; Cason's Equipment; Mean Green Products, LLC.; and Ultra Automotive Inc. d/b/a Orlando's Garage
12:15 noon – 12:45 p.m.	**Lunch** ***Speaker:*** Rick Reibstein, Boston University, Department of Earth and Environment (formerly MA Executive Office of Energy and Environmental Affairs)
12:45 p.m. – 1:30 p.m.	**Electric Battery Powered Equipment — What Do You Need To Know?** Electric battery powered equipment technology differs in important ways from gas-powered internal combustion technology. Education and training on electric battery equipment can help land care professionals attain comparable productivity to gas equipment safely and efficiently. This session will review operation, handling, storage, and maintenance issues, demonstrate potential reductions in greenhouse gases, discuss cost-effectiveness, and provide information on equipment specs and upcoming certification programs. OSD will review how to find and purchase this equipment from Statewide Contracts. ***Speakers:*** Jamie Banks, Quiet Communities; Trey Gowdy, Leading by Example; Julia Wolfe, MA Operational Services Division; and Paul Martin, MA Operational Services Division
12:45 p.m. – 1:30 p.m.	**Moving from Gas to Electric — Making the Transition at Your Facility** The American Green Zone Alliance is helping communities transition to low noise, zero emissions land care. Through its AGZA Green Zone® program, the city of South Pasadena, California, and its Arroyo Seco golf course became the nation's first AGZA Green Zone city and golf course. This session focuses on successful models and strategies in making the transition to electric battery powered equipment, as well as lessons learned and things to avoid. ***Speaker:*** Dan Mabe, American Green Zone Alliance
2:15 p.m. – 3:30 p.m.	**Electric Equipment Demonstration** ***Vendors***

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American Green Zone Alliance
www.agza.net

COMMBUYS – The Commonwealth of Massachusetts online procurement center
www.commbuys.com

Commonwealth of Massachusetts' Environmentally Preferable Products Procurement Program
www.mass.gov/epp

Contract User Guide for Statewide Contract FAC88: Lawns & Grounds, Equipment, Parts, and Services
www.mass.gov/doc/fac88/download

Quiet Communities
www.quietcommunities.org

Commonwealth of Massachusetts
Executive Office for Administration & Finance
Operational Services Division
One Ashburton Place, Room 1017
Boston, MA 02108-1552
(617) 720-3300
mass.gov/osd

- **Agenda for Boylston Learning Session**

Welcome to the

Commercial-Grade, Zero-Emission Landscaping Equipment Learning Session

Tower Hill Botanic Garden
Boylston, MA
Thursday, September 27, 2018
9:00 a.m. – 3:30 p.m.

September 27, 2018

Welcome to the Tower Hill Botanic Garden and a day devoted to learning about the advantages of commercial-grade, zero-emission landscaping equipment, now on Statewide Contract! These alternatives to gas-powered equipment offer many health and environmental attributes, meet strict construction and durability requirements, and provide long-term savings opportunities.

Quiet Communities and the Operational Services Division has planned a comprehensive agenda to give participants an appreciation of the quality and viability of these options, together with facts and resources to help you make informed buying decisions on behalf of your organization. We are excited to spend the day with you!

Our panel and breakout sessions will provide an in-depth understanding of the new technologies, give first-hand access to organizations that have led by example, and detail the transition process. Among other resources, you will learn how to calculate long-term savings when opting for these sustainable alternatives, as well as environmental impacts associated with their use.

Additionally, later today be sure to take the opportunity to try out electric battery equipment on Statewide Contract and speak with Statewide Contract Vendors.

Today's event is made possible by the National Association of State Procurement Officials (NASPO) Green Purchasing Technical Assistance Funds (GPTAF). NASPO GPTAF seeks to leverage the purchasing power of state government to conserve energy and national resources, limit environmental pollution and waste, improve public health, encourage clean technologies, and create cost savings opportunities and a balanced economy. We express our sincere thanks to NASPO and to the Tower Hill Botanic Garden for graciously providing their venue to host our event. Thank you, too, for taking time out of your busy schedule to join us today!

Sincerely,

Maureen Barends
Director of Strategic Sourcing Services

OSD
OPERATIONAL SERVICES DIVISION

Agenda

8:30 a.m. – 9:30 a.m.	**Registration, Coffee, and Continental Breakfast**
9:30 a.m. – 9:45 a.m.	**Opening Remarks** ***Speakers:*** Grace Elton, Tower Hill Botanic Garden; Rick Reibstein, Boston University, Department of Earth and Environment (formerly MA Executive Office of Energy and Environmental Affairs); and Julia Wolfe, MA Operational Services Division
9:45 a.m. – 10:30 a.m.	**Gas-Powered Landscape Maintenance Practices — A Growing Concern** Landscape maintenance practices depend heavily on gasoline. Concerns are growing about the impact of noise, emissions, and waste noise, as well as the health of workers, the public, and the environment. This presentation will discuss the impacts, concerns, and benefits of alternative solutions. ***Moderator:*** Jamie Banks, Quiet Communities ***Panelists:*** Heather Alker, UMass Medical School; and Erica Walker, BU School of Public Health
10:30 a.m. – 10:45 a.m.	**Break**
10:45 a.m. – 11:30 a.m.	**The Promise of Electric Technology** Electric battery technology is advancing, enabling communities to create low noise, emissions-free parks, campuses, and other spaces. At this point, the technology is practical and cost-effective to use for a substantial amount of commercial scale work. This panel will discuss where the technology is today, the economics and ROI considerations, and where things are heading. ***Speaker:*** Dan Mabe, American Green Zone Alliance
11:30 a.m. – 12:00 noon	**Leading By Example** A growing group of state agencies, municipalities, schools, businesses, and even golf courses(!) are taking bold steps to transition away from gas-powered landscape maintenance for reasons of health, environmental quality, sustainability, and quality of life. This session will present the ways in which these players are leading by example in their regions and the nation and provide information on what you can do to get ready for Spring 2019. ***Moderator:*** Trey Gowdy, Leading by Example ***Panelists:*** Dan Delventhal, MowGreen Lawn Care; Stephen Brown, MA Department of Conservation and Recreation; Christine Scalera, Town of Southampton, NY; and Todd Cournoyer, UMass Amherst
12:00 noon – 12:15 p.m.	**Introduction to Vendors and Equipment** Boston Lawnmower Company, Inc.; Cason's Equipment; Mean Green Products, LLC.; and Ultra Automotive Inc. d/b/a Orlando's Garage ***Speaker:*** Tom Tagan, MA Division of Capital Asset Management and Maintenance
12:15 noon – 12:45 p.m.	**Lunch** **Addressing Climate Change: How Massachusetts is Leading by Example** ***Speaker:*** Eric Friedman, MA Department of Energy Resources
12:45 p.m. – 1:30 p.m.	**Electric Battery Powered Equipment — What Do You Need To Know?** Electric battery powered equipment technology differs in important ways from gas-powered internal combustion technology. Education and training on electric battery equipment can help land care professionals attain comparable productivity to gas equipment safely and efficiently. This session will review operation, handling, storage, and maintenance issues, demonstrate potential reductions in greenhouse gases, discuss cost-effectiveness, and provide information on equipment specs and upcoming certification programs. OSD will review how to find and purchase this equipment from Statewide Contracts. ***Speakers:*** Jamie Banks, Quiet Communities; Trey Gowdy, Leading by Example; Julia Wolfe, MA Operational Services Division; and Paul Martin, MA Operational Services Division
12:45 p.m. – 1:30 p.m.	**Moving from Gas to Electric — Making the Transition at Your Facility** The American Green Zone Alliance is helping communities transition to low noise, zero emissions land care. Through its AGZA Green Zone® program, the city of South Pasadena, California, and its Arroyo Seco golf course became the nation's first AGZA Green Zone city and golf course. This session focuses on successful models and strategies in making the transition to electric battery powered equipment, as well as lessons learned and things to avoid. ***Speaker:*** Dan Mabe, American Green Zone Alliance
2:15 p.m. – 3:30 p.m.	**Electric Equipment Demonstration** ***Vendors***

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American Green Zone Alliance
www.agza.net

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www.mass.gov/epp

Contract User Guide for Statewide Contract FAC88: Lawns & Grounds, Equipment, Parts, and Services
www.mass.gov/doc/fac88/download

Quiet Communities
www.quietcommunities.org

Commonwealth of Massachusetts
Executive Office for Administration and Finance
Operational Services Division
One Ashburton Place, Room 1017
Boston, MA 02108-1552
(617) 720-3300
mass.gov/osd

Links to Presentations:

Heather Alker, MD, MPH	Rethinking Gas Powered Lawn Equipment
Jamie Banks, PhD, MS	Why Go Electric?
Stephen Brown	Leading by Example
Todd Cournoyer	U MA Landscape Management: Battery Powered Outdoor Power Equipment
Michelle Davis, Tom Tagan	2018 Tool Barn Overview
Dan Delventhal	Mow Green Zero Emission Lawn Care: Healthier Yards, Less Pollution & Noise
Eric Friedman	Leading by Example & Battery Powered Landscaping Equipment
Paul Martin	How to Purchase Commercial Grade Battery Electric Lawn Equipment in CommBuys
Rick Reibstein, JD	The Opportunity to Participate in the Evolution of New Technology
David Webster	City of Cambridge: Battery Operated Equipment Usage
Julia Wolfe	Commercial-Grade Zero Emissions Landscaping Equipment: Opening Remarks

ATTACHMENT E: Walden Pond Impact Analysis

WALDEN POND LANDSCAPE MAINTENANCE EQUIPMENT *PRELIMINARY* EMISSIONS IMPACT ANALYSIS

Prepared by Quiet Communities, December 2018

Walden Pond uses a variety of gas-powered equipment to maintain its property areas. These include:

- A large (48") walk-behind Scag mower
- A 21" Husqvarna push mower
- Redmax string trimmers
- Redmax backpack leaf blowers
- A walk-behind blower
- A hedge trimmer

The use of this equipment in routine maintenance (excluding special or infrequent tasks) generates emissions known to be toxic and/or carcinogenic. On an annual basis, these include:

- 211 lbs/year of non-methane hydrocarbons (e.g., including benzene, 1,3 butadiene, formaldehyde, acetaldehyde)
- 51 lbs/year of nitrogen oxides
- 5,672 lbs/year of carbon monoxide
- 26 lbs of fine particulate matter (2.5 micron diameter or less)

The equipment also generates approximately 17,300 lbs/year of the greenhouse gas, carbon dioxide[7].

Replacement of all equipment with battery electric counterparts would eliminate all emissions at point of operation. Replacing just the Scag mower with a battery electric counterpart would have a major impact on these emissions. Here are the percent reductions that would result from this single replacement.

- 29% of hydrocarbons
- 91% of nitrogen oxides
- 82% of carbon monoxide
- 3% of fine particulates
- 80% of carbon dioxide

The magnitude of these reductions is explained in large part by the age of the Scag mower (19 years) and that it is only emissions compliant at the Phase 1 level (three phases have been implemented largely aimed at reducing ozone-forming emissions).

[7] All calculations derived from *Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition, US Environmental Protection Agency,* July 2010, EPA-420-R-10-019, NR-010-f.