

PRINCETON BATTLEFIELD

A MOWING REDUCTION ANALYSIS

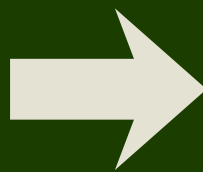


NEW MOWING PLAN

**75 to 85% reduction in
mowing hours**

PREVIOUS MOWING ROUTINE

**1,367 to 2,051 lbs
CO₂/year**

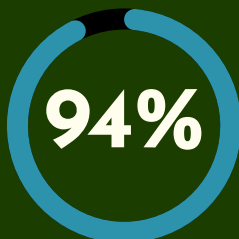


NEW MOWING ROUTINE

**205-513 lbs
CO₂/year**

SWITCHING TO ELECTRIC?

**1,292-1,938 lbs CO₂
saved every year**



reduction in emissions

THAT'S EQUIVALENT TO...

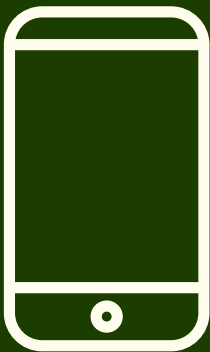


1,733 MILES DRIVEN

in an average gas-powered passenger vehicle (roughly equivalent to driving one-way from Princeton, NJ to Denver, Colorado)



76.6 GALLONS OF GAS CONSUMED



**55,007
SMARTPHONES
CHARGED**



**11.3 SEEDLINGS
GROWN**

for 10 years sequester this much carbon.

Methodology

The previous mowing plan covered roughly 80 acres twice per month for approximately five months, or about 10 mowing cycles each year. One gasoline-powered riding mower was used for two to three days during each mowing cycle, operating from 8:00 a.m. to 2:00 p.m. Assuming that the mower was used for 70% of the time (taking into account water breaks and lunch), in total, this works out to around 84 to 126 of effective hours using the lawnmower each year.

The U.S. Environmental Protection Agency (Greenhouse Gas Equivalencies Calculator - Calculations and References) estimates that burning one gallon of gasoline releases approximately 19.6 pounds of carbon dioxide. A University of Maryland analysis found that a gasoline commercial zero-turn mower used approximately 0.83 gallons of fuel per operating hour (Toward Net Zero: Strategic Integration of Electric Mowers into Landscape Maintenance Operations). Based on that usage rate, the previous mowing plan produced approximately 1,367 to 2,051 pounds of carbon dioxide per year.

The new mowing plan reduces mower operating hours by an estimated 75 to 85%. Based on the former emissions estimate, this change decreases carbon emissions by approximately 1,026-1,743 pounds of carbon dioxide each year.

As a result, annual mowing emissions are now estimated at approximately 205-513 pounds of carbon dioxide per year, rather than 1,367-2,051 pounds.

Switching from a gasoline mower to an electric mower would substantially reduce the carbon footprint of mowing while also eliminating the mower's on-site exhaust emissions. Princeton is supplied through New Jersey's portion of the RFC East electricity-grid region, where the EPA's latest eGRID data report an average emissions rate of approximately 599.2 pounds of CO₂ per megawatt-hour, or about 0.60 pounds per kilowatt-hour. (U.S. EPA eGRID 2023 Summary Data) A University of Illinois comparison of riding mowers found that an electric mower used approximately 1.5 kilowatt-hours of electricity per operating hour and produced about 0.45 kilograms of CO₂ per acre, compared with 6.2 kilograms of CO₂ per acre for a gasoline mower. (University of Illinois EnergySense).

Based on that electricity estimate and Princeton's regional grid, electric mowing would produce roughly 0.9 pounds of carbon dioxide per operating hour, or approximately 75-113 pounds per year under the previous schedule. This is far lower than the estimated 1,367-2,051 pounds of CO₂ produced annually by the gasoline mower, meaning a switch to electric equipment could decrease emissions by roughly 1,292-1,938 pounds of CO₂ each year, a reduction of 94%.

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