



CLIMATE *Friendly* PARKS

National Mall and Memorial Parks Climate Action Plan

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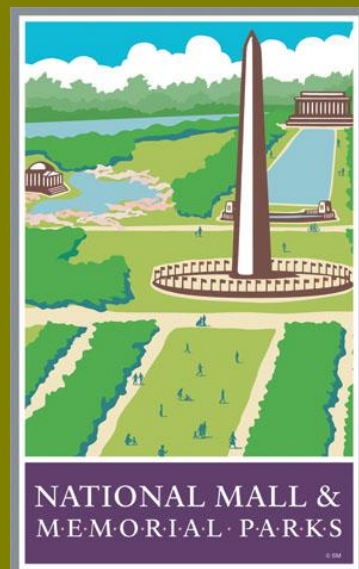
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Introduction

NATIONAL MALL AND MEMORIAL PARKS

The keystone symbols of America's heritage in our nation's capital, managed by the National Mall and Memorial Parks, host over 25 million



visits each year. These public spaces and structures provide visitors with personal, political and educational experiences, as well as a myriad of venues for relaxation and recreation.

National Mall and Memorial Parks (or park), a unit of the National Park Service (NPS), preserves and protects more than 1,000 acres of parkland throughout Washington, D.C., which contain the following resources: Washington Monument, Thomas Jefferson Memorial, Lincoln Memorial, Franklin Delano Roosevelt Memorial, Martin Luther King, Jr. Memorial, Ulysses S. Grant Memorial, District of Columbia War Memorial, World War II Memorial, Korean War

National Oceanic and Atmospheric Administration (NOAA) tide-gauge records show relative sea levels in the mid-Atlantic have risen over a foot in the past one hundred years due to a combination of naturally occurring regional land subsidence and global sea level rise.¹

Veterans Memorial, Vietnam Veterans Memorial, George Mason Memorial, Pennsylvania Avenue from the Capitol to the White House, the National Mall, East and West Potomac Parks, Constitution Gardens, 60 statues, and numerous other historic sites, memorials, and parklands. These significant natural and cultural resources are cherished symbols of our nation's history, known worldwide and depicted on everything from currency to the nightly news.

As the steward of the nation's most valued public lands, the National Park Service (NPS) has an obligation and an opportunity to be a leader in protecting the environment. As a participant in the Climate Friendly Parks (CFP) program,

National Mall and Memorial Parks belongs to a network of parks that are at the forefront of sustainability planning in national parks. By developing an emission inventory, setting an emission reduction target, developing this climate action plan, and committing to educate park staff and the public about climate change and National Mall and Memorial Parks' mitigation efforts, the park is leading by example. In so doing, the park commits to the following actions with the overall goal of reducing greenhouse gas (GHG) emissions from park operations by 6% below 2008 levels by 2020:

1. Improve accuracy of park energy and transportation data.
2. Establish a means to determine site-specific water consumption.
3. Increase energy efficiency of existing assets and operations.
4. Encourage opportunities for renewable energy use at the park.
5. Improve processes related to energy management.
6. Reduce employee emissions within the park.
7. Reduce visitor emissions within the park.
8. Develop employee incentive program to reduce emissions associated with commuting.
9. Reduce solid waste through responsible purchasing, increased recycling, and composting.
10. Increase climate education programs with National Mall and Memorial Park staff.
11. Increase climate education with National Mall and Memorial Parks visitors.
12. Communicate with NPS partners and concessioners about the park's climate action plan.

The National Mall and Memorial Parks' climate action plan serves to support and enhance existing initiatives such as the park's environmental management system (EMS) and the National Capital Region's (NCR) EMS. An EMS is a management tool and organizational means to apply continuous improvement principles and strategic planning methods that reduce environmental impacts and achieve sustainability goals. The park's EMS is a comprehensive management system that addresses all environmental programs at the park and provides the context for actions that



reduce park emissions. The NCR EMS addresses the energy and climate-related goals for all parks in the region and aligns with Executive Orders 13423 and 13514. This National Mall and Memorial Parks climate action plan will be incorporated into the park's EMS. Additionally, the Climate Action Plan, with its focus on energy and water use, solid waste management and recycling, and transportation, complements the park's new National Mall Plan, which was signed by Secretary of the Interior Ken Salazar and NPS Director Jon Jarvis on November 9, 2010. It should be noted that the purpose of this Climate Action Plan is to reduce park GHG emissions and is not intended to address park adaptation to climate change impacts.

THE CHALLENGE OF CLIMATE CHANGE

The atmosphere has a natural supply of gases that trap heat and keep the temperature of the Earth warm enough for life to survive. Such gases are known as greenhouse gases, or GHGs. The anthropogenic release of certain GHGs, including carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), through industrial processes has affected the quantity of GHGs in the atmosphere. These gases—which can stay in the atmosphere for at least fifty years and up to centuries—are accumulating in faster than natural processes are able to remove them, in effect, creating an extra-thick heat blanket around the Earth. The increase in GHGs is causing an overall warming of the planet, commonly referred to as global warming. The term climate change describes the variable consequences of global warming over time.

According to the Intergovernmental on Climate Change (IPCC), the leading international organization for the assessment of climate change, “Continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century.”² Rising global temperatures will further raise sea-level and affect all aspects of the water cycle, including snow cover, mountain glaciers, timing of spring runoff, water temperature, ocean currents and upwelling, salinity levels of inland coastal waters, and aquatic life. Climate change is also expected to affect human health, alter crop production, animal habitats, and many other features of our natural and managed environments.

NATIONAL MALL AND MEMORIAL PARKS AND CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service. In the mid-Atlantic region, which includes Washington, D.C., sea-level is rising 1 to 2 inches per decade. However, climate change is expected to cause sea level to rise 15 to 40 inches, or double that rate, by 2100.³ In addition, due to sediment compaction processes that cause land in the mid-Atlantic to sink, sea level rise in the region is currently significantly greater than global sea level rise.⁴

At National Mall and Memorial Parks, increased temperatures and hydrologic changes will alter the natural and manmade landscape of the park's structures and open space, impacting the wide variety of ecological, cultural, and recreational features the park currently provides. Climate change may affect the cultural and natural resources entrusted to the National Mall and Memorial Parks. The following potential climate change impacts were considered while the park staff developed this climate action plan:

- Landscape changes that will affect access to and the structural integrity of monuments;

¹ Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region. U.S. Climate Science Program. Synthesis and Assessment Product 4.1. January 2009. Page 2. www.climate-science.gov/Library/sap/sap4-1/final-report/sap4-1-final-report-all.pdf

² Intergovernmental Panel on Climate Change, Climate Change: 2007: Synthesis Report, page 45, www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

³ U.S. Environmental Protection Agency. EPA/903/F-00/002. June 2001. How Will Climate Change Affect the Mid-Atlantic Region? http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=4011

⁴ Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid- Atlantic Region. U.S. Climate Change Science Program. Synthesis and Assessment Product 4.1. January 2009. Page 19. www.epa.gov/climatechange/effects/coastal/pdfs/SAP_4-1_SynthesisandAssessmentProduct.pdf



- Changing growing seasons that will affect vegetation, including the nationally valued cherry trees;
- Increased opportunity for invasive species establishment;
- Lack of predictable management needs for broad expanse of turf grass on the National Mall; and
- Shifts in tourism trends related to temperature changes.

By measuring and reducing GHG emissions from park-related activities, National Mall and Memorial Parks intends to minimize its contribution to climate change and the resulting detrimental impacts.

INVENTORY PROCESS

The park's GHG emissions inventory was completed by gathering data from park staff and concessioners, then entering this data into the Climate Leadership in Parks (CLIP) tool. The CLIP tool was developed by the NPS CFP program in association with the U.S. Environmental Protection Agency (EPA) to account for GHG emissions specific to national parks. The tool is designed to:

- Convert energy and resource use data into metric tons of CO₂ equivalent (MTCO₂e);
- Educate park employees about the emissions inventory process through data gathering;
- Assist with identifying strategies for each park to reduce emissions through a workshop; and
- Enable park personnel to track current and future progress towards emissions reduction goals.

The National Mall and Memorial Parks staff gathered annual usage data (e.g. gallons of fuel used in a year) related to park operations, concessioner operations and visitor travel within park boundaries for the baseline inventory year, fiscal year (FY) 2008. Data categories include stationary combustion, mobile combustion, purchased electricity, waste, fertilizer, refrigeration and wastewater. The data was entered into the CLIP tool which automatically converts the park's data into "metric tons of carbon dioxide equivalent" (MTCO₂e), a single unit that normalizes CO₂, N₂O and CH₄⁵. The output of the CLIP tool is the park's emissions profile, which was used to prioritize GHG emission reduction strategies.

National Mall and Memorial Parks' Emissions Profile

The National Mall and Memorial Parks' GHG inventory includes emissions from park operations, concessioners and visitors. Park concessioners include Golf Course Specialists, Inc. (GCSI), Guests Services, Inc. (GSI) and Landmark Tourmobile Services (Tourmobile). GCSI operates East Potomac Golf Course, which consists of three golf distinct courses and a small restaurant. GSI is the park's primary food and beverage supplier and also manages an ice rink on park property. Tourmobile operates hop on/hop off shuttle tours that travel throughout the park. Visitor emissions are estimated from visitor vehicle transportation within park property.

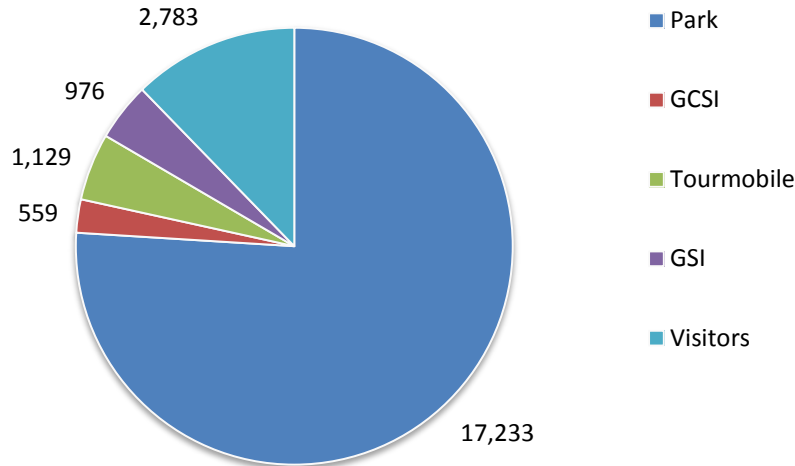
Total GHG emissions from park operations, concessioners and visitors for FY 2008 were estimated to be 22,680 MTCO₂e. Approximately 17,233 MTCO₂e, which is 76% of total emissions, are from park operations. 2,663 MTCO₂e, or approximately 12% of total emissions, are from the park's concessioners, and 2,783 MTCO₂e, also approximately 12% of total emissions, are from visitor vehicles. The National Mall and Memorial Parks' GHG inventory is influenced by the unique features and operations of the park, causing some emission sources to be higher compared to other national parks. For example, the park is entrusted with a large number of historic structures that require power and lighting on a consistent basis. Also, there are hundreds of acres of landscaping to maintain and large amounts of

⁵ The conversion of a GHG to MTCO₂e is based on the potential of that GHG to contribute to the greenhouse effect, or its global warming potential (GWP), relative to the potential of CO₂ which is given the GWP of 1. CH₄'s GWP is 21 and N₂O's GWP is 310, meaning that an equivalent amount of CH₄ has 21 times the potential of CO₂ and N₂O has 310 times the potential of CO₂ to contribute to global warming.



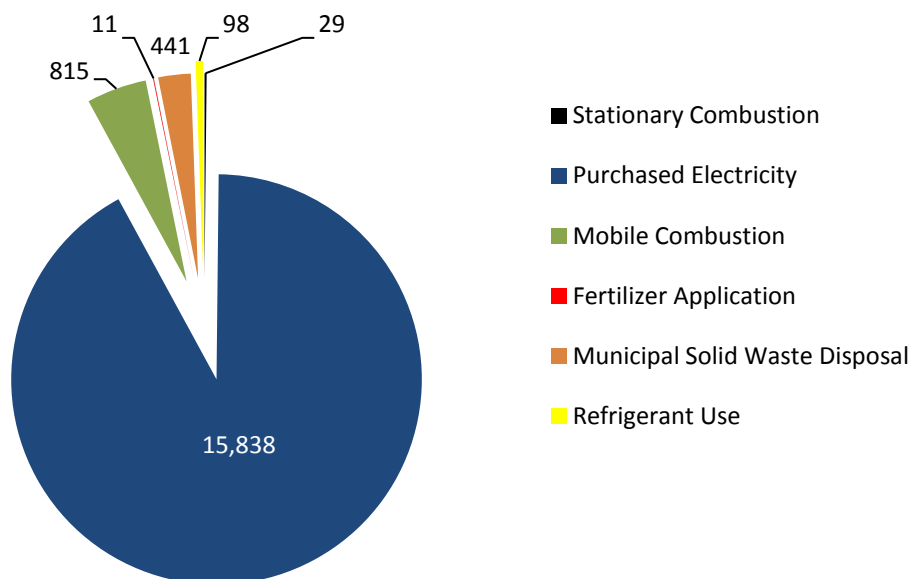
visitor solid waste generated. Conversely, the park experiences lower emissions from visitor vehicles since most visitors walk between memorials and monuments. See Figure 1 below for the total park emission profile.

FIGURE 1 NATIONAL MALL AND MEMORIAL PARKS PARK OPERATIONS, VISITOR AND PARK CONCESSIONER TOTAL GREENHOUSE GAS EMISSIONS (TOTAL: 22,680 MTCO₂E)



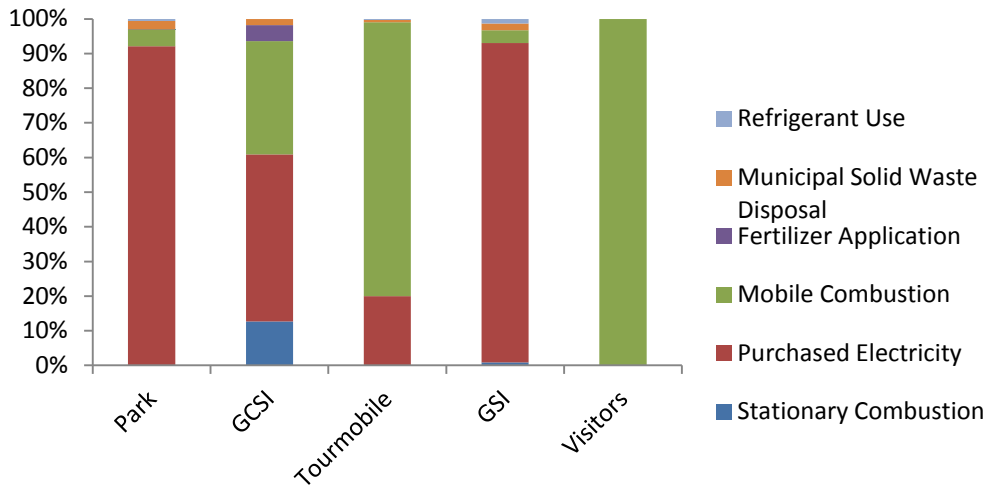
In order to target emissions reductions efforts, the park assessed park operations emissions by source. At 15,838 MTCO₂e, or 91%, emissions from purchased electricity are by far the largest source of GHG emissions from park operations. At 815 MTCO₂e (4.7 %) and 441 MTCO₂e (2.6 %) respectively, mobile combustion and municipal solid waste disposal are the next largest sources. Combined, emissions from refrigerant use (98 MTCO₂e), stationary combustion (29 MTCO₂e), fertilizer use (11 MTCO₂e), and wastewater treatment (1.5 MTCO₂e) make up less than 1% of total emissions from park operation. See Figure 2 for a breakdown of sources.

FIGURE 2 NATIONAL MALL AND MEMORIAL PARKS GHG EMISSIONS FROM PARK OPERATIONS BY SOURCE (TOTAL: 17,233 MTCO₂E)

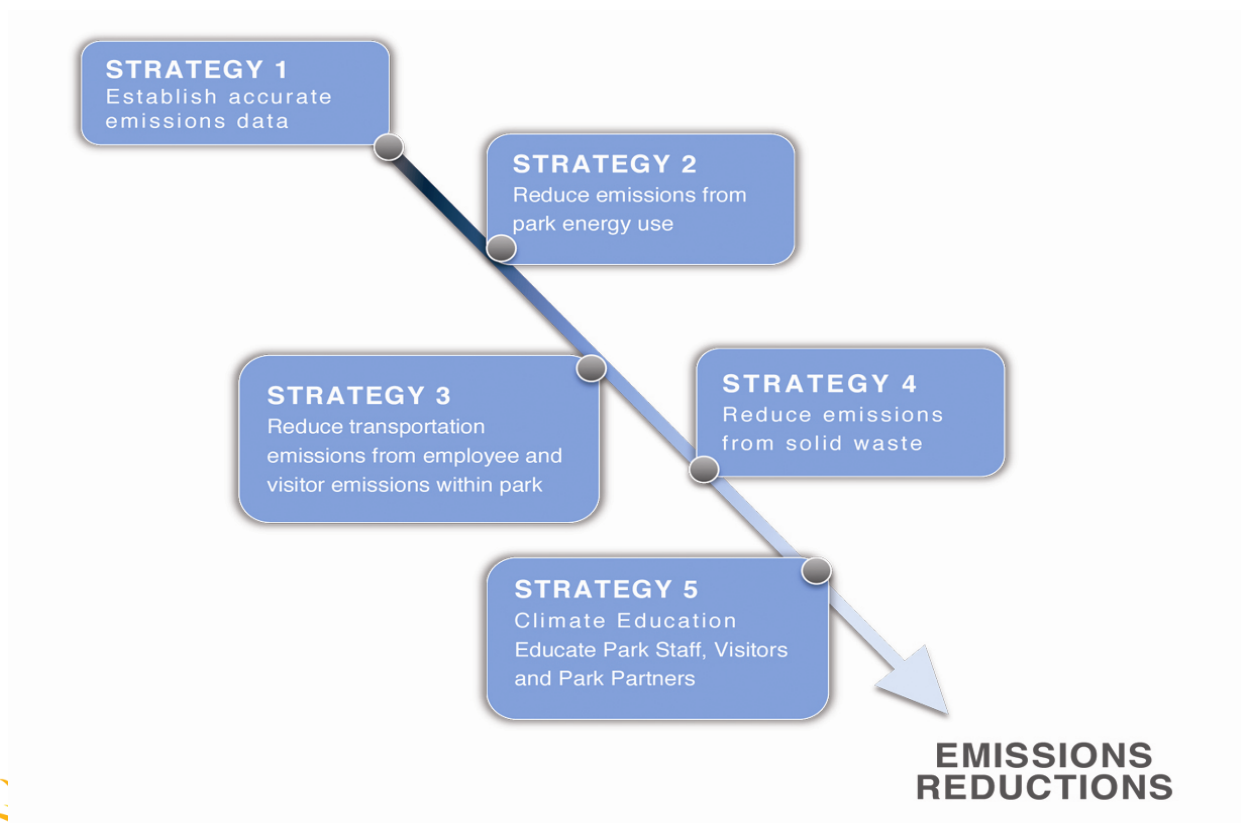


The emissions profile for each group (park operations, concessioners and visitors) differs according to each organization's activities. Close to 90% of the both park and GSI emissions come from purchased electricity since both organizations primarily manage energy-intensive facilities. GCSI' has a large relative proportion of emissions from fertilizer application, which is not surprising, given its extensive golf courses. Tourmobile's largest emissions source is, also not surprisingly, from mobile combustion. The only visitor emissions source analyzed was transportation. See Figure 3 below.

FIGURE 3 NATIONAL MALL AND MEMORIAL PARKS PARK OPERATIONS, VISITOR AND PARK CONCESSIONER GHG EMISSIONS PERCENT CONTRIBUTION BY SOURCE



Strategies for Reducing Emissions



The National Mall and Memorial Parks developed GHG reduction strategies and actions during the park's CFP action planning workshop held November 2-3, 2010 at the park headquarters in Washington, D.C. Strategies focus on: ensuring accurate data tracking, reducing energy consumption, transportation emissions, water use, and waste generation, and increasing climate change educational efforts. Developing and implementing a comprehensive action plan will allow for better data management and therefore better informed decision making. The National Mall and Memorial Parks strategies to reduce emissions are prioritized based on emission reduction potential, cost-effectiveness, feasibility, co-benefits, local impact, and ability to rapidly implement.



STRATEGY 1: IMPROVE ACCURACY OF EMISSIONS DATA TRACKING

In order to reach GHG reduction goals, the park recognizes the importance of reliable and accurate data. As the first step of its energy reduction strategy, the park will implement procedures to improve data collection and monitoring of purchased electricity, transportation, and water use.

PROGRESS TO DATE:

- Completed energy audit report and baseline GHG analysis in 2010.

THE NATIONAL MALL AND MEMORIAL PARKS COMMITS TO THE FOLLOWING ACTIONS TO IMPROVE DATA COLLECTION PROCESSES AND ACCURACY.

- 1 Improve accuracy of park energy data.
 - Review the most recent energy audit report and identify information gaps
 - Align energy bills with meters, assets, and locations
 - Install meters and sub-meters in strategic locations
- 2 Improve accuracy of employee fleet fuel use and mileage data.
- 3 Improve understanding of employee commuting and visitor-related transportation challenges.
- 4 Establish a means to determine site specific water consumption at high use sites.

STRATEGY 2: REDUCE GHG EMISSIONS FROM OCCUPIED FACILITIES BY 20 PERCENT AND FROM TOTAL ENERGY USE BY 5 PERCENT BELOW 2008 LEVELS BY 2020

The most significant amount of GHG emissions stems from energy use in facilities. Therefore, the National Mall and Memorial Parks will continue to focus on implementing energy conservation measures such as improving insulation and reducing electricity use first, then implementing the actions below. The park will focus reduction actions on electricity use. In addition to reducing GHG emissions, reducing energy use will provide the park with financial savings from reduced energy costs.

PROGRESS TO DATE:

- Completed an energy audit, which included a lighting inventory and potential energy conservation projects.
- Replaced many incandescent bulbs with compact fluorescent lamps or light-emitting diode bulbs.
- Installed motion sensors for lighting in conference rooms.
- Replaced heating-ventilation-air conditioning systems throughout the park.

THE NATIONAL MALL AND MEMORIAL PARKS COMMITS TO THE FOLLOWING ACTIONS IN ORDER TO REDUCE PARK ENERGY USE:

- 1 Increase energy efficiency for existing assets and operations.
 - Continue to replace inefficient lighting with more efficient alternatives.
 - Eliminate redundant lighting fixtures where feasible and increase use of natural day-lighting where possible.



- Install motion sensors for lighting, programmable thermostats, solar tube lighting.
 - Conduct a small-scale smart power strip pilot project (using existing meters and 2-4 smart power strips) in order to support potential large-scale power strip replacement.
 - Research opportunities to increase energy efficiency of buildings, e.g. through reflective roofs
- 2** Encourage opportunities for renewable energy use at the park.
- Explore the potential for renewable energy projects:
 - Pursue partnership with Virginia Tech to gauge interest in installing ADCP at in/outlet bridges to assess tidal energy potential.
 - Install solar panels on rooftops.
 - Solar charging stations for park electric vehicles.
 - Work with local energy companies to identify energy offset options.
- 3** Improve processes related to energy management.
- Establish strategies for keeping up with preventative maintenance for energy consuming equipment and systems; in particular, evaluate the need for annual service contracts for heating-ventilation-air conditioning maintenance.
 - When appropriate, implement alternative employee work schedules and draft mutual telecommuting agreements.
 - Develop a formal policy for seasonal start-up and shut-down of monument display fountains.

STRATEGY 3: REDUCE GHG EMISSIONS FROM TRANSPORTATION BY 20 PERCENT BELOW 2008 LEVELS BY 2015

Transportation is the National Mall and Memorial Parks' second largest source of GHGs. Therefore, reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce the park's emissions.

PROGRESS TO DATE:

- Currently, park employees have the opportunity to use electric carts and bikes for local travel.

THE NATIONAL MALL AND MEMORIAL PARKS COMMITS TO THE FOLLOWING ACTIONS TO REDUCE PARK EMISSIONS FROM TRANSPORTATION:

- 1** Reduce employee emissions within the park.
- Explore videoconferences and telecommuting.
 - Eliminate unnecessary employee vehicle idling within park.
 - Seek opportunities for electric and hybrid options and strategies to match vehicles with job needs.
- 2** Reduce visitor emissions within the park.
- Implement the preferred alternative in the Visitor Transportation Study for the National Mall and Surrounding Areas.
 - Promote alternative transportation use and reduce congestion by emphasizing regional transit connections and encourage alternative transit use.



- Convert free parking to metered parking.
- Emphasize biking and walkability.
- Explore possible future changes to concessions contracts regarding fleet standards.
- Enforce bus idling restrictions and work with stakeholders to develop a tour bus management plan.
- 3** Develop employee incentive program to reduce emissions associated with commuting.
 - Consider additional incentives for employees to use alternative transportation and carpooling.

STRATEGY 4: REDUCE GHG EMISSIONS FROM WASTE BY 25 PERCENT BELOW 2008 LEVELS BY 2020

Waste management—in the form of source and solid waste reduction—can dramatically reduce GHG emissions. Reducing the amount of waste sent to landfills reduces CH₄ emissions caused by decomposition as well as the GHGs emitted from the transportation of waste. Purchasing and wise use of products is closely tied to reducing waste generation. The less the park and its visitors consume in terms of products and packaging, the less energy is used and fewer GHGs are emitted.

PROGRESS TO DATE:

- Implemented employee and National Mall recycling programs.
- Began implementing a green procurement hub at Brentwood Maintenance Facility.

THE NATIONAL MALL AND MEMORIAL PARKS COMMITS TO THE FOLLOWING ACTIONS TO REDUCE PARK EMISSIONS FROM WASTE GENERATION:

- 1** Reduce solid waste through responsible purchasing, increased recycling, and composting.
 - Continue to work towards centralized green purchasing of janitorial and office supplies through the Brentwood procurement hub.
 - Expand current recycling efforts.
 - Explore options for more beneficial disposal of organic waste.
 - Explore the potential to add recycling requirements to permits.

STRATEGY 5: INCREASE CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS REDUCTION EDUCATION AND OUTREACH

The National Mall and Memorial Parks are visited by millions of people from around the world annually and have an enormous opportunity to educate the public about climate change and GHG emissions reductions. There are also opportunities to educate park staff and members of the surrounding community.

THE NATIONAL MALL AND MEMORIAL PARKS COMMITS TO THE FOLLOWING ACTIONS TO INCREASE CLIMATE CHANGE EDUCATION WITH PARK STAFF, VISITORS AND THE LOCAL COMMUNITY.



- 1 Increase climate education with National Mall and Memorial Parks staff.
 - Develop informational sheet for staff that explains tangible savings associated with energy reduction strategies.
 - Provide talking points to interpretive staff on climate change issues/environmental achievements of park.
 - Educate staff on the Climate Action Plan during interpretive and all staff trainings, and allow the Superintendent to communicate to staff about the importance of the CFP program.
 - Educate staff on fuel efficiency through color-tagging program.
 - Consider placing educational signage on lights, computers, and bathrooms stalls.
 - Incorporate regular updates on the park's sustainability initiatives into park newsletter.
 - Develop internal park intranet and use as a communication medium.
 - Utilize volunteers with certain skill sets that can help meet objectives and provide training.
- 2 Increase climate education with National Mall and Memorial Parks visitors.
 - Identify and address challenges for developing climate change programs for visitors and identify methods and opportunities to weave interpretive climate change information into existing programs, specifically the current recycling program.
 - Utilize teachable periods (e.g., Cherry Blossom Festival) to share climate change information with visitors.
 - Research informal opportunities to educate visitors including developing and posting signage for: electric carts, bicycles, bus idling, bathroom stalls, park construction projects, and the international public
 - Use website to disseminate information
- 3 Communicate with NPS partners and concessioners about the park's Climate Action Plan.
 - Incorporate language related to the park's Environmental Management System, including any priority CFP initiatives, into existing and new concession contracts.
 - Discuss the park's Environmental Management System goals, including any priority CFP initiatives, during annual evaluation process with concessionaires.
 - Determine appropriate permitting practices to help meet Environmental Management System goals, including any priority CFP initiatives.

Conclusion

The National Mall and Memorial Parks has a unique opportunity to educate and set an example for the millions of visitors who visit our nation's capital every year. This report summarizes the actions by which the park commits to reducing its GHG emissions. By addressing GHG emissions in a targeted, prioritized manner, the park will tackle emissions reductions efficiently and effectively. Additionally, by sharing these strategies with park visitors, concessioners and partners, the National Mall and Memorial Parks will promote an awareness of climate change and promote actions to reduce GHG emissions on a broader scale.

