

CLEAN CITIES NOW



Tackling Transportation:
Clean Cities and NPS
Team Up to Steer
National Parks Toward
a Sustainable Future

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Clean Cities National
Parks Initiative Celebrates
5 Years

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Cow-Powered, Renewable
Natural Gas Fleet

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Promotes Health Across
the Region



Welcome

We hope you enjoy this latest edition of *Clean Cities Now*, the official newsletter of the U.S. Department of Energy's Clean Cities program. This semi-annual publication showcases program activities, accomplishments, and resources and highlights the successes of Clean Cities' nearly 100 coalitions as they work to reduce petroleum use in transportation.

This edition, we're celebrating two very important milestones: the National Park Service's (NPS) centennial, and the five-year anniversary of the Clean Cities National Parks Initiative (CCNPI), a vital partnership between our program and the NPS. There has never been a better time to reinvest in preserving our national parks. Our role in this partnership presents us with an exciting opportunity to support the NPS as it transitions to using more renewable and alternative fuels and advanced transportation technologies. Of course, these efforts could not have been accomplished without the on-the-ground work from many Clean Cities coalitions around the country. See page 8 to read about how some of our coalitions teamed up with their local parks to ensure these sustainable transportation projects were successful.

We appreciate hearing comments from readers. Let us know what you think at cleancities@nrel.gov.



Dennis A. Smith

Dennis A. Smith
National Clean Cities
Director



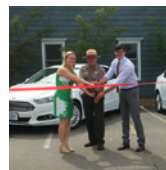
Linda Bluestein

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National Clean Cities
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Photos (above, top) from DOE, NREL 17030; (above, bottom) by Trish Cozart, NREL 17004

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U.S. Department of Energy

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Coalition Announcement

The U.S. Department of Agriculture (USDA) is partnering with 21 states through the Biofuel Infrastructure Partnership (BIP) to nearly double the number of fueling pumps nationwide that supply ethanol blends to American motorists. As a result of the BIP, about \$210 million in infrastructure is being installed throughout 2016 at nearly 1,486 retail fuel stations across the states selected for the awards. This will extend the availability of higher blends of ethanol, such as E15 and E85, as well as mid-level ethanol blends.

Eight Clean Cities coalitions have been tapped by their respective state agencies managing this grant to provide education and outreach support on the projects. The coalitions include:



Central Florida Clean Cities Coalition
(cleancities.energy.gov/coalitions/central-florida)
Coordinator: Colleen Kettles



Iowa Clean Cities Coalition
(cleancities.energy.gov/coalitions/iowa)
Coordinator: Stephanie Weisenbach



Lone Star Clean Fuels Alliance (Central Texas)
(cleancities.energy.gov/coalitions/lone-star)
Coordinator: Stacy Neef



State of Maryland Clean Cities
(cleancities.energy.gov/coalitions/maryland)
Coordinator: Mike Jones



State of West Virginia Clean Cities
(cleancities.energy.gov/coalitions/west-virginia)
Coordinator: Kelly Bragg



Twin Cities Clean Cities Coalition
(cleancities.energy.gov/coalitions/twin-cities)
Coordinator: Lisa Thurstin



Virginia Clean Cities
(cleancities.energy.gov/coalitions/virginia)
Coordinator: Alleyn Harned



Wisconsin Clean Cities
(cleancities.energy.gov/coalitions/wisconsin)
Coordinator: Lorrie Lisek

Program Resources

- Read the recently released report, **Costs Associated With Non-Residential Electric Vehicle Supply Equipment** (afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf) to learn vital information for controlling the costs associated with purchasing, installing, and owning non-residential charging equipment.
- Subscribe to the Vehicle Technologies Office's **National Idle Reduction Network News** newsletter (energy.gov/eere/vehicles/vehicle-technologies-office-national-idling-reduction-network-news) to stay up-to-date with helpful tips for identifying consistent, workable solutions to reduce vehicle idling across the country.
- Explore the best practices for planning, organizing, hosting, and executing a successful workplace charging event in the **Workplace Charging Toolkit: Workshop Best Practices** (energy.gov/eere/vehicles/workplace-charging-toolkit-workshop-best-practices).



A new USDA grant will nearly double the number of ethanol fueling pumps nationwide.
Photo from General Motors

National Parks Initiative Celebrates Five Years, Continues to Drive Parks Toward a Sustainable Future

Each year, hundreds of millions of visitors travel to nearly 400 national parks across the United States to experience unique natural and cultural resources. With that kind of volume, it has become increasingly difficult to reduce impacts to the surrounding air quality and overall experience. In fact, transportation within the parks from fleet and visitor vehicles accounts for the majority of the average park's greenhouse gas (GHG) emissions. GHGs are a major contributor to climate change, which in turn affects not only national parks, but people and the surrounding environment in many ways.

To support the agency in its mission to address these impacts, the U.S. Department of Energy's Clean Cities program formalized its long-time relationship with the National Park Service (NPS) in 2010 through an interagency agreement called the Clean Cities National Parks Initiative (CCNPI). This has provided a means to promote actions that reduce fuel consumption, increase the use of alternative fuels and technologies, reduce GHG emissions, and raise awareness among staff, partners, and visitors.

Since the CCNPI began just five years ago, Clean Cities and the NPS have made significant strides together by partnering on more than 30 projects across 29 parks. The projects have helped get alternative fuel and fuel-efficient vehicles on the road, reduce vehicle idling, and improve fleet efficiency. While the formal partnership exists at the national level, it's the local connections between park units, Clean Cities coalitions, communities, and industry that are truly responsible for making these projects successful.

Because of these efforts, visitors can charge their plug-in electric vehicles, parks now use propane-powered shuttles and mowers, and everyone can learn about sustainable transportation through educational programs, outreach, and online resources and toolkits (see Feature article, p. 8).

These actions also support the agency's promise to address climate change impacts through the Climate Friendly Parks Program, one of many initiatives supporting the larger NPS *Green Parks Plan*. The Program provides parks with the tools and resources—such as the support provided through the CCNPI—to address climate change and ensure the most sustainable operations across the agency.

Another key part of greening the parks is the NPS fleet management team. The team's goal is to optimize the NPS fleet, set the

By the Numbers: Five Years of the Clean Cities National Parks Initiative

- 30 projects funded
- 29 national park units involved
- 19 supporting Clean Cities coalitions
- 85 petroleum-fueled vehicles replaced with alternative fuel or fuel-efficient vehicles
- 62 electric vehicle charging stations installed
- 34 propane mowers deployed
- 5 propane stations installed
- 425 metric tons of CO₂ reduced each year
- 70,000 gallons of petroleum fuel cut each year
- 70 million visitors exposed to CCNPI projects each year
- 20 education and publicity events
- Green Rides Toolkit developed (cleancities.energy.gov/technical-assistance/green-rides/)
- Green Rides video developed for public outreach nationwide (youtu.be/9hR6oBxM22E)
- Transportation infographic developed for public outreach (cleancities.energy.gov/files/pdfs/green-your-ride-infographic.pdf).

standard for efficiency, and lead by example to foster sustainability and environmental responsibility within the agency and beyond.

“We continue to focus our attention on green-minded transportation strategies,” said Scott Berklacy, NPS fleet management specialist. “Service-wide, we are committed to achieving great results through our ongoing quest to reduce our carbon footprint and petroleum fuel use within fleet operations.” This commitment will see additional emphasis this year as NPS approaches a major milestone.

With its 100th anniversary coming up this August, the agency has expressed a bold vision for how it will continue preserving the country's greatest natural wonders: to move into its next century even more sustainably than its first. By building on the past five years of successful collaboration and innovation, Clean Cities and the NPS are positioned to meet this challenge with a renewed agreement for continued partnership, projects, and progress.

ampCNG Puts Conventional Fuels Out to Pasture with Renewable Natural Gas

When ampCNG isn't busy expanding its national network of public natural gas stations, the company is hard at work managing its fleet of long-haul delivery trucks for its subsidiary company, Renewable Dairy Fuels. ampCNG's fleet of milk transport trucks runs on compressed natural gas (CNG) made from cow manure produced at Indiana-based Fair Oaks Farms' dairy operation. In just four years, ampCNG has driven millions of miles on this renewable form of natural gas, or RNG, and has displaced nearly 6 million gallons of petroleum in the process.



Working with Fair Oaks Farms, ampCNG invested in the largest digester-to-RNG production project in the country. The resulting fuel is used in a fleet of 42 milk transport trucks. *Photo from ampCNG, NREL 37377*

ampCNG's Cow-Powered Trucks

ampCNG, a CNG station developer based in Chicago, Illinois, is on a mission to help fleets switch from conventional fuels to RNG. To date, ampCNG owns 19 CNG fueling stations throughout the country, and ultimately plans to expand to more than 100 stations. The company has also been an active member of the Greater Indiana Clean Cities (GICC) coalition since 2009, and joined the U.S. Department of Energy's National Clean Fleets Partnership (NCFP) in 2013.

ampCNG's interest in using more sustainable forms of fuel began in 2010, when the company partnered with Fair Oaks Farms to develop an anaerobic digester that would convert cow manure to biogas—an effort to help the farm meet aggressive national emissions standards.

“We were searching for investment opportunities in renewable energy when we heard about the Fair Oaks Farms’ plan to build a digester,” said Steve Josephs, co-founder and director of engineering at ampCNG. “ampCNG was interested in the project, so we invested in the digester in the hopes of producing renewable power.”

Completed in 2011, the digester converts cow manure to nearly carbon-neutral biogas, and eventually pipeline-quality natural gas. When electricity prices dropped in 2011, ampCNG began researching other ways to use the excess biogas. ampCNG ran the numbers and determined that using RNG as a transportation fuel for its fleet of milk transport trucks would result in greater financial savings and emissions reductions. ampCNG's continued investment



A Ruan milk transport truck fuels up at one of ampCNG's RNG stations. Since 2011, the fleet of CNG trucks has driven 38 million miles. *Photo from ampCNG, NREL 37376*

with Fair Oaks has allowed the venture to become the largest producing digester-to-RNG project in the country. In addition, the fuel production facility at the farm is connected to the Northern Indiana Public Service Company pipeline, so any excess RNG is routed into the pipeline.

"This project was a huge undertaking, but ampCNG set the stage for other like-minded fleets to learn from their experiences," said Kellie Walsh, GICC executive director and ampCNG's National Clean Fleets Partnership account manager.

With the help of GICC and a partnership with their truck outfitter, Palmer Trucks, ampCNG acquired forty-two

9-liter (L) natural gas delivery trucks. In addition, the company installed an on-site fueling station in Fair Oaks, Indiana, and later added another station in Sellersburg, Indiana, to fuel the trucks on both ends of their route. ampCNG's carrier company, Ruan Transportation Management Systems (Ruan)—also a member of the NCFP—was a key partner in implementing the project. The fleet's first 9L Kenworth CNG tractors went into service in 2011 and paved the way for the second-generation fleet of 12L tractors, beginning in late 2013.

ampCNG received a \$2 million American Recovery and Reinvestment Act (Recovery Act) award to purchase the CNG tanks for the initial 9L trucks, which they removed and installed on

the 12L trucks during the transition. In addition, GICC facilitated an additional \$750,000 Recovery Act award to fund the fueling infrastructure installation.

"We took a pretty deep dive into a project that wasn't completely vetted at the time," Josephs said. "The individual pieces—the digester and the CNG trucks—were proven technologies on their own, but no one else had tried to put these pieces together before. And it worked!"

Throughout the project, ampCNG worked closely with GICC for assistance in securing grants, understanding federal and state funding, and navigating the permitting process.



“GICC’s support was instrumental to this project,” Josephs said. “Clean Cities was with us from the start and they continue to provide the resources, funds, and support we need to meet our shared goal of petroleum reduction.”

Waste Not, Want Not

Since ampCNG deployed its first-generation truck fleet in 2011, the fleet has logged 38 million miles on RNG. As a result, the company has been able to displace nearly 6 million gallons of petroleum, reduce 7,100 tons of carbon dioxide emissions, and save approximately \$3 million in fuel. Because of the fleet’s high mileage, the typical payback period on each truck is about three years.

Financial benefits aside, ampCNG is seeing other perks from their RNG project.

Ruan’s drivers enjoy the quiet, high-performing tractors and the fact that the fuel is odorless upon combustion.

“The cows don’t take the weekends off, so these trucks run two to three shifts per day, 365 days a year,” Josephs said. “When we began this project, the CNG tractors were still fairly new to the market and the number of fleets using them for long-distance hauling was limited. But these trucks have proven to be a big hit with our drivers, and they work for our business.”

Additionally, ampCNG’s partners are pleased with the outcome.

“Starting something new, like running an RNG fleet, isn’t necessarily easy, but working with ampCNG and our other partners has allowed us to keep moving toward our sustainability goals,” said Mike McCloskey, co-founder of Fair Oaks Farms.

As icing on the cake, ampCNG’s efforts in fleet sustainability earned it a nomination for the Commercial Carrier Journal’s Innovator of the Year in 2012. In addition, ampCNG was featured in a 2011 MotorWeek episode (afdc.energy.gov/case/503), and will appear again in a future episode that highlights recent progress.

Steering Others in the Right Direction

Like all fleets trying a new fuel or technology, ampCNG experienced some challenges during implementation. Specifically, the horsepower of the 9L engines presented a challenge to the long-distance hauling operations. ampCNG overcame this issue by working with Palmer Trucks to open an on-site garage in Fair Oaks, staffed with mechanics dedicated to maintaining the tractors. Once the company upgraded to the 12L engine, the fleet has reported no issues related to horsepower.

ampCNG also struggled with navigating the digester permitting process, but

worked with GICC to overcome these hurdles.

“This was the first time a digester had sold fuel to a utility and injected it right into the pipeline system. ampCNG worked with us to figure out the permitting process, the renewable identification number system, and the price point,” Walsh said.

Milking it for all it’s Worth

ampCNG is now committed to teaching other fleets about CNG, based on its experiences. Specifically, its CNG 101 website (ampcng.com/cng-101/) provides white papers, videos, cost calculators, and other resources to assist fleets interested in using CNG.

“We are a rolling laboratory,” Josephs said. “We believe strongly in our experiences and want to share what we’ve learned with others.”

ampCNG continues to push for alternative fuel use, despite the recent dip in petroleum prices. Rather than shifting away from natural gas, ampCNG encourages fleets to use the savings from low gasoline prices to invest for the future in their alternative fuel portfolio.

“Based on our experience, the economics of natural gas works,” Josephs said. “There’s no doubt that one day conventional fuel prices will rise again and prove how volatile they are. When that day comes, you don’t want to be starting at square one with alternative fuels.”

Additionally, Josephs recommends that fleets experiment with one or two trucks to get operational experience.

“Do your homework,” Walsh echoed. “Every fleet is different, so do the research. Start a small pilot and take advantage of your local Clean Cities coalition to learn more about your options.”

ampCNG’s fleet and fueling station work has just begun. The company plans to continue championing renewable fuels and fleet sustainability until the cows come home!



These hybrid Ford Escape vehicles at Grand Teton National Park were purchased with support from the Clean Cities National Parks Initiative. *Photo from Yellowstone-Teton Clean Cities, NREL 35886*

Alternative Fuels Help Ensure America's National Parks Stay Green for Another Century



More than 140 years ago, the establishment of Yellowstone National Park ignited a movement to safeguard pristine lands around the nation and the world. Some years later, the National Park Service (NPS), a new federal agency designed to preserve current and future national parks and monuments across the United States, was born out of an act signed by President Woodrow Wilson. The purpose of the NPS, as the act stated, was to "... conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

In 2016, the NPS celebrates its 100th year and is seeing interest like never before. The allure of America's national parks draws more than 300 million people each year from far and wide seeking to experience the same "unimpaired" scenery, nature, and history. The number of visitors, NPS staff, and concessioners driving personal and fleet vehicles has made that aim more difficult though, as transportation now accounts for 85% of the average park unit's greenhouse gas (GHG) emissions.

In its vigilance to protect the parks, the NPS teamed with the U.S. Department of Energy (DOE) through the Clean Cities National Parks Initiative (CCNPI), a collaboration specifically aimed at bringing together the resources of the Clean Cities program and the NPS to minimize petroleum use and reduce emissions in the parks.

Five years later, 29 parks together with 19 Clean Cities coalitions have completed more than 30 CCNPI projects. The projects have impacted nearly 70 million visitors and cumulatively reduce about 70,000 gasoline gallon equivalents of petroleum each year. The Initiative also strives to inspire and motivate park visitors to take similar actions when they return home or to their place of business.



Great Smoky Mountains' "Be Our Idol" campaign encourages drivers to reduce their idling throughout the park. *Photo by Kristy Keel-Blackmon, ETCleanFuels, NREL 37374*

"Clean Cities' national goal of implementing alternative fuels and cleaner, more efficient vehicles is a perfect complement to the NPS mission of preserving our national treasures and resources," said Dennis Smith, national Clean Cities director. "However, the real work happens at the local level. Clean Cities coalitions across the country are partnering with individual parks to introduce new fuels and vehicles into their fleets, leverage resources, and provide technical support. Together, they're also educating visitors on the energy and environmental benefits of improving fuel economy and using alternative fuels."

Parks Invest in a Diverse Portfolio of Technologies

CCNPI projects run the gamut of petroleum reduction strategies, each focused on addressing the needs of an individual park and the surrounding community. Oftentimes a park's first priority is replacing its

fleet vehicles with efficient and alternative fuel vehicles. For example, in recent years, many parks have purchased plug-in electric vehicles (PEVs), along with the associated electric vehicle supply equipment (EVSE).

Converting or replacing lawn equipment can also yield significant benefits. The National Mall and Memorial Parks in Washington, D.C., for instance, are in the process of deploying seven propane mowers, thanks to a donation from the Propane Education & Research Council (PERC), to maintain more than 1,000 acres of greenspace that surrounds the country's national monuments. This equipment is expected to cut GHG emissions in half, compared to their conventional counterparts. PERC has also donated propane mowers to Blue Ridge Parkway, Mammoth Cave National Park, and Yellowstone National Park in support of CCNPI efforts.

While the first formal CCNPI projects did not kick off until 2011, Clean Cities and the NPS have been working together since the 1990s. For example, in 1999 Mammoth Cave National Park started using E85, a high-level ethanol blend containing 51%-83% ethanol depending on season and geography.



National Mall and Memorial Parks' seven new propane mowers maintain more than 1,000 acres of greenspace around the national monuments. *Photo from PERC, NREL 35252*



Compressed natural gas-powered trolleys offer visitors a sustainable transportation option when visiting Crater Lake National Park in Oregon. *Photo from NPS, NREL 37531*

Today the park runs all fleet vehicles on alternative fuels, and continues to benefit greatly from its partnership with Kentucky Clean Fuels, the local Clean Cities coalition led by longtime Coordinator Melissa Howell. At Crater Lake National Park in Oregon, since 2010 visitors have also gotten around in compressed natural gas trolleys, thanks to a partnership with the local utility and assistance from Rogue Valley Clean Cities, led by Coordinator Mike Quilty.

Unique Outreach Campaigns Engage Visitors

In addition to leading by example with their own vehicles, national parks are also educating their visitors through signage and educational presentations about ways to reduce petroleum and emissions. A majority of the outreach campaign for Acadia National Park in Maine, for example, employs a robust array of signs and vehicle decals from the CCNPI Green Rides Toolkit.

“Acadia National Park is proud to participate in the CCNPI. The Green Rides Toolkit is helping the park reduce emissions and educate visitors about the

environmental benefits of reducing petroleum use,” said Acadia Superintendent Kevin Schneider.

Schneider said Acadia has taken their promise to cut petroleum use a step further by partnering with their state department of transportation and local environmental groups to operate the propane-powered Island Explorer bus system, which provides fare-free sustainable transportation throughout the park and gateway communities.

Clean Cities Network Advances NPS Projects

Part of the success of CCNPI is the initiative’s ability to convene all key parties for a successful project. National parks have existing relationships with their concessioners, gateway communities, historical associations, and other partners. On the other hand, Clean Cities coordinators can easily tap their local and national network of vehicle and infrastructure providers, industry associations and experts, and the media. Together, this provides all of the ingredients to a successful alternative fuel project.

Through its relationship with Land of Sky Clean Vehicles Coalition (LSCVC), for instance, Virginia’s Blue Ridge Parkway National Park was able to partner with the Propane Education & Research Council to deploy propane pickup trucks, mowers, and a fueling station. Additionally, Twin Cities Clean Cities helped bring together a diverse set of stakeholders, including municipalities, state parks and other agencies, and a local museum, to install 12 public charging stations within the Mississippi National River and Recreation Area in Minnesota.

As the NPS heads into the next century with a focus on sustainability, Clean Cities will continue to be an important partner in achieving its goals. In fact, based on the success of previous and ongoing CCNPI projects, DOE and NPS are working to formalize the program until at least 2020.

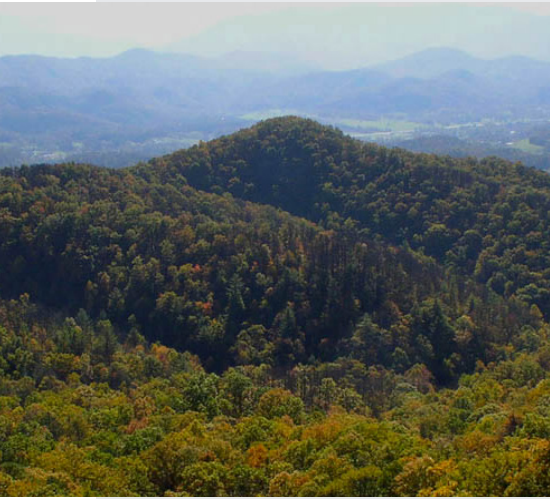
“NPS has many stakeholders and people who care about our parks and the natural beauty they showcase,” said Vic Knox, Associate Director, Park Planning, Facilities, and Lands for the NPS. “We have been fortunate and are very grateful to have collaborated with DOE and Clean Cities coalitions over the past five years to leverage their technical expertise and resources to help NPS achieve our sustainability and energy savings goals. As budgetary pressures increase, these partnerships will become even more important to our stewardship efforts as we head into our next 100 years.”



When the system is in operation, Acadia National Park passes support the Island Explorer bus system. *Photo from NPS, NREL 37371*

Spotlight: Great Smoky Mountains National Park

While Great Smoky Mountains (GRSM) already holds the title for America's most visited national park, in recent years the park has also been working towards another claim to fame—establishing itself as a leader in alternative fuels and



Great Smoky Mountains National Park.
Photo from NPS

advanced vehicles. When GRSM chose to apply for and implement a multi-phase CCNPI project, it not only benefitted from its geographical footprint that includes two states (Tennessee and North Carolina), but also from the support of two Clean Cities coalitions. GRSM collaborated with long-time partners, East Tennessee Clean Fuels Coalition (ETCleanFuels) and LSCVC—led by coordinators Jonathan Overly and Bill Eaker, respectively—to pursue project approval and funding. The park received two rounds of funding from CCNPI in 2013 and 2014, and is currently in the final phases of implementing the project.

GRSM's relationship with Clean Cities began long before CCNPI, however. In 2004, ETCleanFuels engaged GRSM in one of its first projects as a coalition—using B20 (20% biodiesel, 80% gasoline) in its park maintenance vehicles. Today, all of the diesel vehicles in the park's fleet, including 49 pieces of large equipment, now run on B20 year-round. In addition, GRSM uses bioheat—heating oil blended with biodiesel—to heat the park's headquarters offices.

Similarly, LSCVC assisted the park in acquiring more than \$250,000 in Congestion Mitigation and Air Quality Improvement (CMAQ) Program funding to build a biodiesel fueling station and purchase low-speed electric vehicles (EVs) and

hybrid electric vehicles that park rangers use for visitor education and a variety of other tasks.

Building on these previous partnerships, GRSM is now working closely with both coalitions to install four charging stations, including two DC fast chargers, which would be the first of their kind to be installed in a national park. The EVSE will allow visitors from nearby urban PEV hubs, including Atlanta, to visit the park, charge up, enjoy the park while emitting zero tailpipe pollutants, and head home.

“Putting this equipment into use will help us meet our goal of reducing our GHG emissions up to 20% by 2020,” said GRSM Superintendent Cassius Cash.

GRSM has also added three low-speed EVs, converted five mowers to run on propane, and implemented idle-reduction signage and education programs. The project will continue with six scheduled pickup truck propane conversions and two propane fueling station installations, scheduled to be completed in 2016.

Recognizing the importance of partners in overcoming project challenges, GRSM and the coalitions also focused on involving key players from the start. For example, a strategic partnership with Black Bear Solar Institute led GRSM to Nissan Motor Company, who donated DC fast chargers. Overly assisted the park in determining the appropriate fees for use of the charging equipment. The park then connected with the Great Smoky Mountains Association to assist with operations and payment collection.

“The Centennial Initiative motivated us to become more active with our coalitions and be a leader in emissions and petroleum reductions,” said Teresa Cantrell, GRSM Facility Management Program Manager. “My advice to any park is to get involved with your local Clean Cities organizations. Our local coordinators are wonderful; they helped us with every aspect of this project. They know the technology—what's new and what works. They were able to steer us and keep us on track.”

Eaker echoed this sentiment: “CCNPI expanded GRSM's use of alternative fuels and allows visitors to protect and enjoy our natural resources. We love our parks, and we love working with them on such a critical mission.”

Spotlight: Zion National Park

Nearly 2,000 miles from GRSM, Zion National Park (Zion) in Utah has also experienced the benefits of CCNPI first hand. The Zion Group, which includes Zion, Cedar Breaks National Monument, and Pipe Springs National Monument, acquired four plug-in hybrid electric vehicles (PHEVs), installed seven public and five private charging stations. The group also installed idle-reduction signage and implemented education programs.

“This project gave us an opportunity to help meet our petroleum and GHG emissions reductions goals, while preserving our lands,” said Alex Barajas, environmental protection specialist at the Zion Group. While Zion originally applied for the 2013 CCNPI grant independently, a 2015 operational agreement between the three parks served as a mechanism to expand the project and spread the wealth. As a result, each of these parks now has at least one new PHEV, and public charging will soon be available at all three parks.

After only 12 months, the Zion Group’s PHEVs have already saved more than 500 gallons of petroleum and 5.5 tons of



As part of the CCNPI project, the ZNP Group installed seven public and five private charging stations. *Photo by Alex Barajas, NREL 37375*



The Zion Canyon Shuttle System also includes propane buses. *Photo from NPS*

GHG emissions. Through their partnership with the Zion Natural History Association, the parks also sell vouchers for the public to use the charging stations.

Zion is no stranger to alternative fuels, as the park’s fleet of 155 vehicles includes 42 alternative fuel vehicles. With the help of Utah Clean Cities Coalition (UCCC), Zion began using propane shuttle buses in its fleet in 2000, a project which Barajas says, “Stands up to the test of time as a great environmental initiative.”

“Zion has always demonstrated leadership when it comes to alternative fuels,” said Robin Erickson, UCCC executive director, who has been instrumental in bringing together key players for the park’s alternative fuel initiatives. “As a result, we have seen a trickle-down effect with several other parks in the region becoming interested in EV charging, as well as hotels and others in the gateway community of Springdale.”

Zion remains poised as a leader in the promotion and adoption of alternative fuels. In the near future, the park plans to increase the number of electric drive vehicles in its fleet and looks forward to sharing its experiences with other parks in the state.

Clean Cities National Parks Initiative

Since 2010, Clean Cities and the NPS have partnered on 30 projects to deploy alternative fuel and fuel-efficient vehicles, and reduce idling:

- Acadia National Park (ME)
- Blue Ridge Parkway (NC, VA)
- Catoctin Mountain Park (MD)
- Cedar Breaks National Monument (UT)
- Christiansted National Historic Site (U.S. Virgin Islands)
- Denali National Park and Preserve (AK)
- Florissant Fossil Beds National Monument (CO)
- Golden Gate National Recreation Area (CA)
- Grand Teton National Park (WY)
- Great Smoky Mountains National Park (NC, TN)
- Independence National Historical Park (PA)
- Mammoth Cave National Park (KY)
- Mesa Verde National Park (CO)
- Mississippi National River and Recreation Area (MN)
- National Mall and Memorial Parks (DC)
- Nicodemus National Historic Site (KS)
- Pea Ridge National Military Park (AR)
- Petrified Forest National Park (AZ)
- Petroglyph National Monument (NM)
- Pipe Spring National Monument (UT)
- Point Reyes National Seashore (CA)
- Rocky Mountain National Park (CO)
- San Antonio Missions National Historical Park (TX)
- Scotts Bluff National Monument (NE)
- Shenandoah National Park (VA)
- Sleeping Bear Dunes National Lakeshore (MI)
- Wilson's Creek National Battlefield (MO)
- Yellowstone National Park (ID, MT, WY)
- Zion National Park (UT)

Visit the CCNPI website (cleancities.energy.gov/national-parks) for new project announcements, as well as information about how to get involved.



Bill Eaker, Land of Sky Clean Vehicles Coalition (LSCVC); Andrew Hudgins, National Renewable Energy Laboratory; and Jonathan Overly, East Tennessee Clean Fuels (ETCleanFuels). Photo by Jonathan Overly, ETCleanFuels, NREL 37373

Tools & Resources

Clean Cities and the NPS have developed a library of tools, resources, and outreach materials to educate national park employees, partners, neighboring communities, and visitors about reducing vehicle emissions and cutting petroleum use.

These include:

- Green Rides Toolkit (cleancities.energy.gov/technical-assistance/green-rides/)
- Travel Choices Matter Infographic (cleancities.energy.gov/files/pdfs/green-your-ride-infographic.pdf)
- CCNPI Website (cleancities.energy.gov/national-parks)
- NPS Alternative Transportation in the Parks (nps.gov/transportation/alternative_transportation.html)
- NPS Climate Change and Your National Parks (nps.gov/subjects/climatechange/index.htm)
- Green Our Rides to Help Preserve National Parks Video (youtube.com/watch?v=ORrWe00JZso)

Coalition Leader Establishes Unique Initiatives to Effect Change and Protect Ecosystem

Alicia Cox's tenure with Yellowstone-Teton Clean Cities (YTCC) began in 2011 when she joined the coalition as an intern; today, she serves as its executive director. Unlike other Clean Cities



Alicia Cox,
Yellowstone-Teton
Clean Cities. *Photo
from Alicia Cox*

coalitions that serve more urban areas, YTCC is unique in that it supports a sprawling 27,053 square-mile area covering Wyoming and parts of Montana and Idaho, including Yellowstone and Grand Teton national parks.

"While big-city-based coalitions can make a significant impact on greenhouse gas reductions by supporting a large fleet's transition to alternative fuels, we've had to be a bit more creative in finding ways to facilitate substantial change," Cox said.

"The Greater Yellowstone Ecosystem has a long history of land and wildlife conservation," she added. "Local residents and visitors alike are lured here by stunning landscapes, charismatic wildlife, and sky-high geysers. Our outreach efforts tap into this sense of appreciation by encouraging sound environmental stewardship practices that improve air quality and reduce petroleum use."

The Greater Yellowstone Ecosystem, which is partly located in Yellowstone National Park, is one of the last remaining large, nearly intact ecosystems in the northern temperate zone. The 34,375 square-mile area is also home to more than 300 species of animals.

Since taking the helm, Cox has established an assortment of innovative programs, including an energy literacy curriculum that provides teachers with educational materials about alternative fuels and advanced vehicle technologies. Developed with funding from an environmental education grant from the Environmental Protection Agency, the curriculum is geared toward a full spectrum of students, ranging from elementary school students, to middle and high school students, to adult learners.

"Our energy curriculum enables us to reach students of all ages, increasing their awareness about environmental issues and providing them with the skills needed to weigh all sides of an issue and take responsible action," she said.

Cox has also spearheaded a number of other major initiatives on behalf of YTCC. Some of these have included the Sustainability Series, which features monthly meetings and events for the community highlighting local sustainability efforts, and Green Fleets, an alternative transportation consulting service. Additionally, she

played a major role in creating the Greater Yellowstone Electric Vehicle Working Group, which is facilitating the use of electric vehicles and the installation of charging stations in the region; and the Wyoming Natural Gas Vehicle and Infrastructure Coalition, whose mission is to advance natural gas infrastructure and vehicle use in the state.

In partnership with Yellowstone and Grand Teton national parks, YTCC has secured more than \$750,000 from the Clean Cities National Parks Initiative (CCNPI) to support these and other projects that advance cleaner, more efficient transportation in the region.

"In addition to supporting fuel-efficient and low-emission fleet operations in the parks, this funding has enabled us to educate area visitors—some 7 million a year—about clean transportation technologies that help preserve the natural beauty that draws them here," Cox said.

CCNPI funding has also supported the creation of an electric vehicle (EV) charging network via the purchase of six charging stations (three for each park) and two EVs (one for each park). The new charging stations increase the travel radius for typical EVs by hundreds of miles in each direction, allowing EV drivers to travel through the area emissions-free.

Building on this success, the coalition tapped into additional funding—from the Teton Conservation District and the Environmental Protection Agency's Source Reduction Assistance Grant Program—and now offers \$5,000 rebates for businesses and municipalities that install public charging stations in communities surrounding the parks.

"This project serves as a testament to the benefits of the CCNPI, as well as our coalition's capacity to establish the partnerships and support necessary to encourage alternative fuel vehicle use across the region," Cox said.

Cox offered this advice to other coalitions interested in fostering relationships with their local national park: "Find the right park employees—they don't have to be people whose jobs focus on sustainability, just people who can serve as your champions. Once you've found your champions, check in with them frequently, invite them to your stakeholder events and workshops, and encourage them to participate in your committees and forums."

"We are very fortunate in having retired Yellowstone environmental protection specialist Jim Evanoff on our board of directors," Cox added. "Jim was instrumental in reaching out to park employees and initiating relationships with our strongest champions."

When Clean Cities coalitions join forces with the national parks in their regions to foster sustainable transportation solutions, the partnerships help preserve America's natural treasures for generations to come.

Ann Arbor, MI

Michigan's National Lakeshore Reduces Vehicle Impact on the Environment

As part of the Climate Friendly Parks Program, Sleeping Bear Dunes National Lakeshore in Empire, Michigan is always looking for ways to reduce its climate and environmental impact. While the facilities at the park are climate-friendly and energy-efficient, visitor vehicles and the park's fleet offers an opportunity for improvement.

Through a recently formed partnership with Clean Energy Coalition (CEC), which hosts the Ann Arbor and Detroit Clean Cities Coalitions, Sleeping Bear Dunes received roughly \$194,000 in funding from the Clean Cities National Parks Initiative (CCNPI).

"Sleeping Bear Dunes hosted CEC at its climate friendly park workshop, setting the stage for this important partnership," said Sean Reed, executive director of CEC. "Following our presentation on the Clean Cities National Parks program and alternative fuel opportunities for the park, Sleeping Bear Dunes developed a proposal for funding and we identified ways our coalitions could support their efforts."



A propane truck gets fueled for use at Sleeping Bear Dunes National Lakeshore. *Photo by Thomas Ulrich, NREL 36260*



(Left) Sean Reed, Detroit Clean Cities. *Photo from Sean Reed;* (Right) Heather Croteau, Ann Arbor Clean Cities. *Photo from Heather Croteau*

The funding enabled the launch of a collaborative effort to introduce alternative fuel vehicles to the park's fleet, while educating staff and visitors about the impact of vehicle fuel use on the climate.

Tom Ulrich, acting superintendent of Sleeping Bear Dunes, appreciated how the project included more than just vehicles. "I like that the program introduced education and not just vehicles. We were able to teach our staff about driver behavior, implement a motor pool, and install a tire inflation station to educate visitors about our efforts."

In addition to the tire inflation station and driver behavior training, the project replaced older, less efficient fleet vehicles with three Ford Focus plug-in electric vehicles (PEVs) and two ROUSH CleanTech propane trucks. Four charging stations were installed throughout the park for the PEVs. Additionally, the motor pool helped the park gain maximum mileage out of its most efficient vehicles. The electric vehicle technologies alone yielded a 15% reduction in GHG emissions.

The greatest challenge that Ulrich and his staff faced was waiting patiently from one project milestone to another—from receiving the funding to deploying vehicles and implementing technologies to meet the project's goals. It was a few years between grant initiation and completion and, as a result, Ulrich encourages others implementing similar projects to be patient. A smaller challenge that the park faced was breaking old habits and getting used to the motor pool.

"We had some people that would hang onto their keys (instead of returning them to the pool) and forget to sign the log just because it was what they were used to," said Ulrich. With the motor pool in place for over a year now, however, staff has adjusted to the changes.

Overall, efforts led by the Sleeping Bear Dunes National Lakeshore were well received and successful. Ulrich shared that he plans to continue replacing retired fleet vehicles with the most clean and efficient vehicles available.

Dallas Fort-Worth, TX

Electric Vehicles Take Center Stage in North Texas



Pamela Burns, Dallas-Fort Worth Clean Cities coalition. *Photo from Pamela Burns*

Electric vehicles (EVs) took center stage at a variety of events designed to educate participants about available vehicles as well as the related charging infrastructure.

“With stakeholder feedback indicating the need for more EV education, we took a multi-pronged approach to increase our educational outreach,” said Pamela Burns, coordinator of the Dallas Fort-Worth Clean Cities coalition (DFWCC).

“Workplace Charging has been a hot topic lately, so we welcomed the opportunity to participate in the Texas Workplace Charging Roadshow,” Burns said. “As the last location on a tour that stopped in Houston, San Antonio, and Austin, the DFWCC event educated attendees about the benefits, opportunities, and availability of workplace EV charging.”

The event also featured presentations from the U.S. Department of Energy, ChargePoint, Nissan, and DFWCC.



Visitors check out the electric vehicles on display at a National Drive Electric Week event hosted by Dallas-Fort Worth Clean Cities. *Photo courtesy of DFWCC, NREL 35882*



Texas students had fun supporting electric vehicles through a photo booth opportunity offered at a National Drive Electric Week event. *Photo courtesy DFWCC, NREL 37370*

Another outreach opportunity arose when the nationally renowned Perot Museum of Nature and Science in Dallas invited the coalition to participate in the museum’s “discovery days” initiative. Coalition staff members were on hand to answer questions about alternative fuel vehicles while thousands of students checked out the EVs on display.

Finally, after nearly a year of planning, DFWCC hosted a successful National Drive Electric Week event in Grapevine, Texas. The event encouraged owners to bring out nearly 115 EVs—smashing the previous North Texas record for the most EVs in one location.

“Thanks to a robust marketing campaign that included billboard, radio, online, and social media advertising, the DFWCC National Drive Electric Week event was a tremendous success,” Burns said. “We couldn’t have done it without the support from the EV owners, partners, and local entities that helped spread the word via social media.”

The coalition also sponsored the North Texas Renewable Energy Group’s Solar Tour, where attendees visited homes to see different types of solar power installations and were given the chance to test drive a variety of EVs.

“The summer was undeniably busy—planning several events over a relatively short time period is never easy,” Burns said. “Through joint coordination with stakeholders, EV supply equipment companies, passionate EV owners, and many others, our outreach efforts hit the target,” she said. “We credit those parties, as well as our dedicated DFWCC staff members, with providing much-needed EV education to North Texas residents to get people energized and informed about this new technology.”

Louisiana Clean Fuels

Louisiana State University: The State's First Workplace Charging Challenge Partner

Students, faculty, and staff at Louisiana State University (LSU) have easy access to free electric vehicle (EV) charging stations, thanks in part to a collaboration between the Louisiana Clean Fuels (LCF) coalition and LSU's Campus Sustainability department.

"Under our PlugIn Louisiana initiative, we assisted LSU Campus Sustainability in becoming Louisiana's first Workplace Charging Challenge partner," said Ann Shaneyfelt, LCF executive director. "But LSU didn't just jump on the EV bandwagon—this was the result of a nearly five-year partnership between LCF and LSU to provide reliable charging infrastructure on campus."

The first EV charging stations at LSU were introduced in 2011, marking the state's initial foray into the EV scene. Donated by local utility Entergy, the charging stations were paid for by its shareholders through a fund established to reduce greenhouse gas emissions through innovative projects. As a project partner, LCF assisted with educational and promotional efforts.

Although there was clear excitement surrounding the campus's first charging station, the installation process also brought to light policy ambiguities associated with permitting and regula-

tory jurisdiction. For instance, utility regulator rules specify that only utilities (i.e., Entergy) can charge for electricity. Initially, university administrators were also concerned that LSU would be responsible for exorbitant electric bills, but have since said their fears were unfounded because electricity prices turned out to be lower than expected.

"Given the success of Entergy's pilot program, LSU recognized the value of supporting EV drivers, and the university has committed to covering the cost of electricity used for its charging stations," Shaneyfelt said.

Today, the LSU campus has three charging stations. The latest station, installed in 2015, is situated next to the university's new Cypress Hall residence building, which also earned a green building certification.



Students, faculty, and staff at LSU have easy access to free electric vehicle charging stations thanks in part to a collaboration between LCF and LSU's Campus Sustainability department. *Photo from Louisiana Clean Fuels, NREL 35885*



Ann Shaneyfelt, Louisiana Clean Fuels. *Photo from Ann Shaneyfelt*

"The relationship between LSU Campus Sustainability and Louisiana Clean Fuels has played a vital role in the success of our workplace charging program," said Tammy Millican, assistant director of LSU Campus Sustainability. "Since the installation of the EV charging stations on campus, we have seen a dramatic rise in the number of EVs owned by students, faculty, and staff. This has certainly bolstered our mission to enable the university to become more efficient and environmentally responsible, as well as promote alternative modes of transportation."

"For LSU, Workplace Charging has been a win-win—in addition to helping the university meet its sustainability goals, LSU was able to attract a top-notch athlete who, upon learning the school had EV charging stations, gave up a scholarship for another school to attend LSU," Shaneyfelt said. "LSU Campus Sustainability is committed to supporting Louisiana's growing EV culture, and LCF is thrilled to support them in leading the way to more PlugIn Louisiana successes!"

From Urban Air to Algal Blooms: New Haven Intern Promotes Health across the Region

When it comes to grassroots action, getting the right message to the right people is everything—especially when the right people encompass a mix of industry stakeholders, state legislators, and even fourth grade students.



Greater New Haven Clean Cities Coalition intern, Andrea McCarthy, standing behind the coalition's booth at the Milford Energy Fair. Photo courtesy of Lee Grannis, Greater New Haven Clean Cities Coalition Coordinator, NREL 37379

That's why Andrea McCarthy, intern and public outreach champion for the Greater New Haven Clean Cities Coalition (GNHCCC), played a vital role on her team of three. When McCarthy was brought on as New Haven, Connecticut's intern a couple years ago, she worked to expand the coalition's Facebook and Twitter reach, helped revamp their website with a simpler, streamlined interface, redesigned the coalition's newsletter, and helped produce an animated video about propane-fueled school buses (youtu.be/ZCdW6TqF9AQ). To top it all off, she regularly convened an impressive number of state legislators, local businesses, and alternative fuel providers to coordinate on projects

and events. Among her day-to-day projects—extending from event coordination to data analysis—McCarthy found public outreach to be the coalition's most pressing challenge. It was also the most important when it came to boosting local interest in alternative transportation.

She described GNHCCC as a conduit for others to access information on alternative fuels and vehicles. "We're like an honest broker for our stakeholders," said McCarthy. "We don't have any cars or fuels to sell. We just want to share knowledge about what works and what doesn't work—and how to find the best fit for a fleet's particular needs."

Expanding on her communications strategy, which was focused on targeting one small group at a time, McCarthy believes that different people pick up on different aspects of what GNHCCC has to offer. For example, industry groups tend to be interested in the economic benefits of alternative fuels, while residents are concerned about air quality and public health. The reduction in greenhouse gas (GHG) emissions resonates most with government representatives within the State of Connecticut, who are also working with the coalition to pursue statewide climate initiatives.

"It's important we get our message out there and keep all of our stakeholders informed about what's going on so that they get involved," McCarthy said. "It's also just as important to share success stories about our stakeholders."

Among success stories that McCarthy worked to promote was one about the truck hauling company EnviroExpress. The company recently switched to a liquefied natural gas (LNG) fleet, which encouraged another local fleet to convert its own vehicles to LNG. Additionally, the coalition connected Connecticut-based FuelCell Energy with Supreme Industry, a biomass and land clearing company that can produce hydrogen fuel from its organic waste digesters. "We want to make sure that those in our circles, and those who are interested, know about the relevant technology that's available," she said.

On a personal level, one of McCarthy's biggest priorities is public health. She's particularly passionate about improving



GNHCCC intern, Andrea McCarthy, in a BMW i3 electric vehicle just after a stakeholder meeting in New Haven, CT. NREL Image Gallery 37378

environmental conditions for New Haven kids and residents through the deployment of propane school buses. “New Haven has a variety of neighborhoods and demographics,” said McCarthy. “Propane school buses are a great way to make sure the entire city receives the health benefits of a cleaner fuel, regardless of where you live.”

During the summer of 2015, McCarthy collaborated with a propane fuel distributor to create a public-friendly, accessible video that highlights the benefits that propane school buses can offer over traditional diesel buses. The animated video is narrated by a young girl, who introduces her pencil-sketched friends Bill and Sally as they wait for the bus. She then expands on a number of facts that highlight the benefits of propane, accompanied by images and numbers to accentuate each message. The narrator goes on to break down the cost savings that schools could see by switching to propane, stating that the “400 dollars per bus per year” saved on propane could be spent on more teachers, more supplies, and even more field trips.

“We really tried to make it an approachable, easy video to watch, without an abundance of technical information that would bog down the subject matter and make it difficult to comprehend,” McCarthy said. She added that they shared the video with the Propane Education & Research Council, and the coalition further

promoted the video on its website (nhcleancities.org) and social media channels, leading to even more media attention for GNHCCC.

Yet public health and cleaner fuels aren’t the only things that get McCarthy out of bed in the morning. She’s also completing a master’s degree in environmental science at the University of New Haven, where she’s investigating the health of New Haven Harbor’s ecology and the effect of algal blooms on species both big and small. McCarthy, who’s from Indiana and holds a bachelor’s degree in biology from Purdue University, said that she came to Connecticut to study marine biology beyond the coast.

“Environmental issues have always been important to me,” she said, adding that when she graduates this year, she hopes to fuse her expertise in ecology research, alternative transportation, technology deployment, and public outreach. “It would be great if I could combine research, consulting, and media. I think the communication of science is really important.”

As of late April 2016, McCarthy decided to dedicate her time to the completion of her master’s thesis and has since left the coalition. She is currently looking for new opportunities in the environmental and energy sector.

Green Your Ride, Minimize Your Fuel Use

Q: What are some simple and inexpensive ways that any driver can learn from efforts at the national parks and conserve fuel?

A: There are many opportunities for drivers to conserve fuel and reduce emissions, even without implementing alternative fuels or advanced technologies. Clean Cities partners with the National Park Service (NPS) to educate drivers about smart driving behavior and implement idle reduction programs within park boundaries. We can all follow the NPS' lead and take simple steps to make the most of our fuel.

- **Plan Ahead and Lighten Your Load:** Before you even start driving, save fuel and reduce emissions by making a plan. Think about the trips you need to make and whether you can combine and coordinate. Replacing multiple trips with one multi-purpose trip can reduce driving distance and cold



Acadia National Park is one of many parks that use the Green Rides Toolkit, a set of centralized educational materials to engage visitors and staff on the benefits of smart driving practices. *Photo by Christie Anastasia, Acadia National Park, NREL 37369*

starts (remember, your vehicle doesn't achieve its best fuel economy until the engine is warmed up.) In addition, removing unnecessary rooftop boxes or racks and replacing them with rear-mounted cargo boxes and racks is another way to reduce fuel consumption by decreasing aerodynamic drag. Removing heavy items from your vehicle can also improve fuel economy.

- **Maintain Your Vehicle:** Making sure your vehicle operates like a well-oiled machine can improve fuel economy by an average of 4%, while fixing a serious maintenance problem can boost your miles per gallon by as much as 40%. Maintaining properly inflated tires and using the manufacturer's recommended grade of oil also helps maximize your fuel economy.
- **Reduce Idling:** Idling a vehicle gets you nowhere. It reduces fuel economy, produces air pollutants, increases engine wear, and wastes resources. In fact, each year, U.S. vehicles consume more than 6 billion gallons of diesel and gasoline without even moving. Remember, turning your car off and back on again uses less fuel than idling it for 10 seconds or longer.
- **Drive Efficiently:** Efficient driving practices can improve a vehicle's fuel economy by more than 30%. There are a number of important tactics to improve fuel economy and road safety, such as observing the speed limit, reading the road ahead, and gradual braking and accelerating.
- **Reduce Vehicle Miles Traveled:** Whenever possible, consider carpooling or even substituting a car trip with public transit, a bike ride, or a walk. Many of these options are also healthier!

Do you have any questions about alternative fuels, fuel economy measures, or advanced vehicles? The Clean Cities Technical Response Service (TRS) will help you find answers. For more information about the topics in this column or anything in the Clean Cities portfolio, email technicalresponse@icfi.com, or call 800-254-6735.