

# INNOVATIONS IN THE AUTOMOTIVE INDUSTRY

**GREEN CARS, FROM  
FACTORY TO DRIVEWAY**

**FUEL ECONOMY—MAKING  
EVERY MPG COUNT**

**POWERTRAIN TECHNOLOGY  
AND PERFORMANCE**

**HIGH-TECH SAFETY  
INNOVATIONS**

Presented by



[www.nada.org](http://www.nada.org)

The National Automobile Dealers Association (NADA), founded in 1917, represents approximately 20,000 new-car and -truck dealers with about 43,000 separate franchises, both domestic and international.

# GREEN CARS, FROM FACTORY TO DRIVEWAY

Today's manufacturers start addressing green concerns at the factory and carry them all the way to your driveway, with efficient powertrains and increasingly clean emissions.

## Green factories

Automakers have been addressing environmental issues at their assembly plants for years, starting with responsible land management. This is particularly true for 21<sup>st</sup>-century factories designed to minimize impact on the local environment and engineered to limit energy consumption and waste.

True ingenuity can be seen in how they are designed and operated. Many assembly plants aim to achieve and maintain zero landfill status, with all factory waste being either reused, recycled or converted to electricity. Across the board, manufacturers are striving to reduce the energy and water consumed in the assembly process, as well as the chemical, water and material waste. Green

## HOW GREEN IS YOUR MACHINE?

The key to saving at the pump and reducing emissions is fuel economy, and dealers across the country are offering free 10-point Green Checkups to ensure your automobile is operating smoothly and efficiently. The inspection includes checking the following:

**Engine.** A tune-up with spark-plug replacement can keep the engine running smoothly, reliably and efficiently.

**Motor oil.** The proper oil weight reduces internal friction. Replacing conventional oils with synthetics may offer even greater fuel-economy benefits.

**Air filters.** Replacing a clogged air filter can improve a vehicle's gas mileage by up to 10 percent.

**Brakes.** Improperly maintained brakes can cause unwanted drag and can have the same effect as driving with a foot on the brake pedal.

**Tires.** Worn tires should be replaced with the proper manufacturer-recommended size and style. However, in choosing replacements, tires with low rolling resistance can improve fuel efficiency and typically do not cost more than other tires.

*For more fuel-saving tips, go to [www.GreenDrivingUSA.com](http://www.GreenDrivingUSA.com)*

factories are good for the environment, and as many companies attest, it is simply good business.

## Responsible engines

As they have for the past century, mainstream vehicles continue to depend on internal combustion engines. Through engine management computers, sophisticated valvetrains, precise fuel injectors and smartly executed internal components, almost every car on the road today can proudly boast of being more powerful, more fuel efficient and having lower emissions than the model it replaces.

Horsepower and fuel economy are easy to find on a window sticker or brochure, but emissions may seem a bit more foreign. A simple way to look at emissions is to consider how vehicle choice affects your carbon footprint, with fuel economy being directly related to the creation of carbon dioxide, a greenhouse gas. **One gallon of gasoline consumed generates 20 lbs. of CO<sub>2</sub>.**

## Green dealers

Not only are cars going green, but so are car dealers. More than 800 dealers are participating in the Energy Star Small Business Network program sponsored by the Environmental Protection Agency. These dealers have committed to reduce their energy use by 10 percent or more annually. If all U.S. dealerships reduced their energy consumption by just 10 percent, they would save about \$200 million in energy costs and prevent more than one million tons of carbon dioxide emissions every year. To accomplish this goal, many dealerships are investing in cutting-edge heating and cooling methods and more efficient lighting, as well as wind and solar power. Collectively, the automotive industry is doing its part to reduce its environmental impact while continuing to improve its products and services.

## Community Service Department

Across the country automobile dealers are raising the bar not just on customer service, but also community service. For nearly 40 years, TIME magazine has recognized quality dealers for their exceptional industry performance and distinguished community service with the Dealer of the Year Award. Dealers are nominated by either state or local associations of franchised new-car dealers, and a panel of faculty from the University of Michigan Graduate School of Business Administration selects the finalists and winner. Featured on the following pages are some ways the 2008 finalists are giving back and making a difference in their communities.



**TIME MAGAZINE**  
**DEALER OF THE YEAR**  
**GOOD YEAR**





# FUEL ECONOMY—MAKING EVERY MPG COUNT

Fuel prices have skyrocketed over the past two years, placing fuel economy as a primary concern for drivers today and as a key purchase consideration for tomorrow.

Some relief can be found in gas-saving tips (see box on the next page) to help improve the fuel efficiency of any car you drive. But lightening your lead foot will only dull the pain at the pump. For a significant reduction in your operating costs, dramatic lifestyle changes may be necessary, including replacing your aging car with a new, more efficient model.

## Mpg: Updating the numbers

The Environmental Protection Agency has updated its methodology for estimating fuel economy, ensuring each window sticker has numbers that are more real-world representative than what was shown in the past. The revisions factor in America's changing driving behavior, accounting for higher

speeds, faster acceleration and air conditioner use. Although your actual mileage may vary depending on how and where you drive, these figures can be compared between models to provide a more accurate basis for fuel-consumption budgeting. Fuel economy ratings for past years have been updated, enabling comparisons with your current vehicle against those being considered for purchase.

## Reality check: Premium fuel

It may seem hard to avoid high-octane fuel for some shoppers, as many luxury and performance vehicles use premium fuel. Before weighing the costs too heavily in your purchase decision, look at the specific label within the fuel-filler door or in the owner's manual. There are two words used to describe premium fuel usage: "required" and "recommended." If it is "recommended," then the engine will operate just fine on

regular fuel, though it may sacrifice incremental performance at wide-open throttle. Unless you drive full speed at all times, like a race-car driver, this is a reasonable compromise.

If your heart is set on a model that requires premium, a quick calculation can illustrate the likely annual cost. For example, assuming 12,000 miles a year, this divided by 27.5 (the legislated annual fleet average) equals 436 gallons consumed a year. Multiply that figure by 20 cents, the common price spread between regular and premium, and the annual cost is less than \$100—not enough to cause you to pass on a dream car.

## Right-sizing

When choosing your next vehicle, focus on right-sizing, rather than downsizing. Both approaches may lead you to the same models, but the thought process is a bit different. Downsizing assumes you can, and should, live with a smaller vehicle than you currently drive. In reality, you (presumably) purchased your current car to fulfill specific needs, such as passenger and cargo space, ride quality, performance and overall comfort. Today's shoppers are balancing their priorities differently than just a few years ago, tipping the focus to needs over wants in many cases, thereby enabling a different set of compromises than with the last purchase.

Right-size your selections by identifying what attributes you must have, including a realistic fuel-economy target and overall ownership costs. Moving down one class in size can save on up-front purchase costs and likely lead to reduced gas consumption. When truly downsizing, pay extra attention to safety ratings and features to ensure you are not unknowingly making a compromise. **Be aware that front crash test results cannot be compared against other vehicle classes, only against models of similar size.**

In general, cars improve continuously, with each successive generation being better than the one it replaces. And often, the new vehicle is a bit larger. This trend makes it more feasible than you may think to go from a midsize vehicle to a "small" one. Whether looking at sedans or SUVs, today's

## Community Service Department



### ROAD OF OPPORTUNITY

**Tim Smith**, President,  
Bob Smith BMW/MINI,  
Calabasas, CA

Automobile dealer Tim Smith believes in the importance of a value-centered education for all children, which is why he serves on the board of The Catholic Education Foundation. The organization provides tuition grants for the most disadvantaged children in the Los Angeles inner city to attend Catholic grade schools and high schools. Last year, the foundation gave \$11.5 million to 9,000 students.





## FUEL ECONOMY—MAKING EVERY MPG COUNT *(cont.)*

so-called small-class models often sacrifice little over the midsize versions from just five years ago.

Almost as important as the vehicle size is the engine size. Moving from a V8 to a V6, or a V6 to a four-cylinder can make a measurable difference, often with just a modest decrease in practical performance. Many of today's V6 engines are producing more horsepower, even in family sedans, and four-cylinder engines often produce 150-175 horsepower. As a consequence, right-sizing may not be as difficult as you may think.

### Fun with mpg numbers

Clearly, big gains in fuel economy will save money at the pump, but it is less obvious that every mpg does not have an equal impact on your budget. Moving from 15 mpg to 20 mpg makes a much greater difference than going from 25 mpg to 30 mpg. It sounds counterintuitive, until you lay out the math.

Based on driving 12,000 miles a year, 15 and 20 mpg equate to 800 and 600 gallons, respectively—a 200-gallon difference. For 25 and 30 mpg, the difference is just 80 gallons (480 and 400, respectively).

### In the final analysis

Moving to a right-sized, new model can bring true fuel economy benefits, as well as the latest safety equipment and entertainment features. Whatever size you need, research the numbers online at [NADAguides.com](http://NADAguides.com) to understand the true financial picture for the models you are considering, including detailed five-year ownership cost data. And remember, within every vehicle class there are models that are more efficient and/or have lower ownership costs than others. Don't assume that downsizing automatically leads to money saved—check the numbers online. A few minutes of research can help lower your expenses for years to come.

### GREEN DRIVING TIPS

**Drive smoothly.** Easy acceleration and braking can make a measurable improvement in mileage while also reducing engine, transmission and brake wear. You want to avoid a driving style that leads you to accelerate until the point of needing to brake. By looking ahead, anticipating turns, hills and stoplights, you will be able to ease the transition from "Go" to "Whoa."

**Obey the speed limit.** Holding to the posted speed limit will save gas. At highway speed, fuel economy decreases about 1 percent for each mph over 55.

**Cruise.** When possible—and safe to do so—use cruise control. It allows you to hold steady at the optimal speed, reducing the wasteful tendencies of drivers to fluctuate speeds.

**Reduce drag.** Aerodynamics plays an important role in fuel economy, as the engine has to generate enough power to overcome the aero drag caused by the vehicle's exterior design, as well as weight and mechanical rolling resistance. When not needed, remove roof racks, brush guards and bike racks—all disturb the aerodynamics and add weight.

**No idling.** When safe to do so, turn off the engine if you will be sitting still for more than a minute, such as when you're waiting in a parking lot or dropping kids off at school. At idle, the car achieves zero mpg, yet continues to generate greenhouse gases.

**Tire pressure.** Check your tire pressure monthly to ensure it is at the level recommended in your owner's manual or on the tire placard (a sticker often found in the driver's door). Note: The tire pressure figure on the sidewall is the maximum pressure, not what is recommended. Properly inflated tires will provide an optimal balance of braking, handling, wear and, of course, fuel economy.

**Combine trips.** By planning your errands so you can logically chain them together, you can minimize driving and use both your gasoline and time more efficiently.

*For more driving tips, go to [www.GreenDrivingUSA.com](http://www.GreenDrivingUSA.com)*

### Community Service Department



### A TRIP TO THE MOON

**Mark Olinyk**, President, Mark Automotive Inc., Plover, WI

Most of the boys and men of Boy Scout Troop 105 live in group homes for their special needs and disabilities. Twice a year Mark Olinyk takes the Wisconsin Rapids Rotary Special Needs Scouts on a road trip to Milwaukee Brewers and Bucks games. Last year Troop 105 was the color guard for a Bucks game on national television. Mark said, "For these special scouts it was like a trip to the moon!"



# POWERTRAIN TECHNOLOGY AND PERFORMANCE

With elevated gas prices, consumers want to trade in for more fuel-efficient vehicles, and manufacturers are doubling their efforts to keep up with buyer expectations and meet tightening federal mandates.

While they are feeling pain at the pump now, today's motorists are already benefiting from a wide range of powertrain technologies that have seen both performance and fuel economy increase.

As a result, it is common to see midsize family sedans producing more than 250 horsepower—a territory reserved for thirsty V8s just a few years ago. Similarly, V8s have moved up, with over 300 horsepower being the norm, and more than 400 horsepower is increasingly common in high-performance and truck engines. Yet despite these big horsepower figures, fuel economy has held the line, or in many cases improved, with the latest generation of vehicles.

## Underhood wizardry

A variety of elements have contributed to the accomplishments with today's powertrains, from computer-aided design to computerized engine management. Within that spectrum, three technologies stand out for their balanced contributions and ingenuity, pushing both fuel economy and performance to new levels.

**Advanced valvetrains** have led the charge for years, with single and double overhead cam engines enabling impressive efficiency, both in fuel consumption and in creating big horsepower from small, or modest, engine displacements. Increasingly complex, variable systems allow fine electronic and mechanical control over the valvetrain, leading to these results.

**Cylinder deactivation** is being applied to more six- and eight-cylinder engines, enabling them to save fuel during constant-speed cruising and deceleration by shutting down unneeded cylinders. This clever, no-compromise approach provides full power when needed, then seamlessly turns off pairs of cylinders to save fuel and reduce emissions. Already, a wide variety of car types are benefiting from this technology, including minivans, sedans and SUVs.

Backing up these advanced engines are **automatic transmissions with five, six and even**

**seven gears.** By adding more gears, intelligent electronic controls have more ways to match gear ratios with driver needs, smartly balancing performance and fuel economy at all times. Generally, added gears lead to improved overall performance. Similar improvements can be seen as transmissions move to five speeds and beyond. In addition, many engines are available with continuously variable transmissions. These systems allow for infinite variation between the lowest and highest ratios without needing to shift gears.

## Hybrids

By combining a gasoline-fueled engine and electric motors, hybrids have put fuel economy in high gear. Technically, there are two forms of hybrids on the road today: full and mild. The key difference is that a **full hybrid** can power itself at low speeds on purely electric power, leading to the greatest potential fuel savings and emissions reduction. With a **mild hybrid**, the electric power can supplement the engine under load, such as accelerating or climbing a hill. Both forms benefit from an automatic shutoff feature that turns off the engine at a prolonged stop, firing it back up when the accelerator is pressed. In some cases, upscale models with hybrid drivetrains use the electric motors to deliver exceptional performance, with less emphasis on fuel economy.

Driving a hybrid car is just like driving any other. All the power-management magic is handled by the onboard computer, leaving you to simply drive. ➤



## Community Service Department



## STRENGTH IN NUMBERS

**Franklin Downing Jr.,**  
President and CEO,  
Towne BMW, Williamsville, NY

For the past 10 years, Frank Downing Jr., has sat on the board of the YMCA, helping to fulfill the mission of building strong kids, strong families and strong communities. While chairing the YMCA Partner With Youth Campaign, Frank helped to exceed the campaign's \$300,000 fund-raising goal. The money raised enabled thousands of children to participate in YMCA camps, programs and school-age child care.





## POWERTRAIN TECHNOLOGY AND PERFORMANCE *(cont.)*

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### FUTURE POWERTRAINS

The internal combustion engine has served us well for more than a century, and it continues to be an amazingly effective means for generating power.

However, it is clear that electricity will play a key role in the future. Electricity can be generated from a variety of renewable domestic sources, including hydro, solar and wind, and the infrastructure already exists. Right now, electrified next-generation powertrains are hitting the roads in limited numbers.

**Pure-electric production and concept cars** are proving that electric cars needn't perform like golf carts. While it is a small-volume niche now, the initial electric models from specialty automakers and conversion houses are demonstrating the potential energy-saving benefits. Several major corporations are rapidly developing pure electric cars, but for mainstream consumers, hybrid cars are leading the transition to electricity-based propulsion.

The limiting factor for electric-powered cars is the size and storage capacity for batteries. This has also challenged automakers looking to transition from today's gasoline-electric hybrids to tomorrow's plug-in hybrids. When feasible, plug-ins will offer a marked improvement in fuel economy as they can store enough energy to allow the vehicle to operate in pure-electric mode for an effective range. Some of today's traditional hybrids have limited electric-only abilities, but the plug-in models just on the horizon promise up to 40 miles of travel, or enough for a typical round-trip commute. These vehicles could recharge overnight at home, when electric rates are lower.

**Fuel-cell vehicles** are on the road today in small test fleets, with some being driven by customers. These vehicles use hydrogen gas under extreme pressures to generate electricity as the gas is moved through a proton-exchange membrane and combines with atmospheric oxygen. Clean water is the only byproduct, making these the greenest of machines. Building a refueling infrastructure is among the challenges fuel-cell vehicles face in their drive to widespread availability, approximately 15-20 years from now.

### Community Service Department



### SUPPORTING THE COMMUNITY, ONE MARINE AT A TIME

**Harry Brown**, President, National Dodge Inc., Jacksonville, NC

Harry Brown's National Dodge is in close proximity to two Marine Corps Air Stations and Marine Corps Base Camp Lejeune. So it is no surprise that Brown supports community organizations that help Marines and their families. Two programs he sponsors are "Based on Need," a scholarship foundation for students of active duty military personnel, and the Marine Corps Celebrity Golf Classic, which provides funds to support the Wounded Warrior Program.



# HIGH-TECH SAFETY INNOVATIONS

Today's new cars are safer than ever before, driven by increasingly stringent federal requirements, widely publicized crash test ratings and competition among manufacturers.



There is an excellent chance that the new models you are considering have more safety features than your current vehicle, and beneath the sheet metal, the architecture may also have been engineered with greater sophistication to better manage crash forces and protect the occupants.

Even still, it is important to your family and friends that you take safety seriously when researching your next vehicle purchase. The **overall structure and air bags** are evaluated by the National Highway Traffic Safety Administration and the Insurance Institute for Highway Safety, each using different front and side crash tests. Between the two organizations, their ratings can give an excellent perspective on how the cars hold up in common crash scenarios and the effectiveness of the supplemental restraints.

If every vehicle were equipped with **electronic stability control** (ESC), up to 10,000 lives could be saved a year. ESC is a low-cost addition to an **antilock brake system** (ABS) that allows the vehicle to make proactive throttle and brake adjustments when it senses the car is sliding. It cannot overcome the basic laws of physics, but ESC can provide an extra margin of safety most appreciated in slippery conditions and on SUVs, which have a higher rollover rate than cars.

## High-tech safety innovations

As ABS, ESC and side air bags become increasingly common, manufacturers have continued to look for ways to further protect occupants and ultimately avoid accidents altogether. A wide variety of high-tech innovations that are available on luxury cars have great promise as they trickle down to larger-volume models.

Starting in your driveway, **back-up cameras** can enhance your rear visibility, a particular concern with

larger vehicles. In 2007, more than 900 children were injured, or worse, in back-over accidents. Once on the road, **blind-spot monitors** can alert when a vehicle is detected to the side with a simple light indicator by the side mirrors.

Staying on course will naturally help avoid trouble, and **lane-departure warnings** can help the driver avoid wandering, often due to distraction or being drowsy. Another aid that could be classified as a convenience is **adaptive cruise control**. Just as the name suggests, an adaptive system will slow the car when you approach slower-moving traffic. Change into an open lane and your car will resume the programmed speed.

Perhaps the ultimate example of the car looking out for you is the **pre-collision system**. Sensing an imminent impact, these systems can help maximize braking while preparing the car appropriately for what may be a hard impact by pre-tensioning the seat belts, adjusting the seat backs, closing the moonroof and preparing to inflate the air bags based on seats occupied.

While such extreme protection is found only on premium vehicles now, simpler a la carte items can be found on even entry-level cars this year. Notably, **brake assist** can sense the intended brake application by the swiftness the pedal is depressed and accelerate the brake actuation. Active head rests are another clever, relatively low-cost device. These essentially protect the head in a whiplash scenario, minimizing injury.

While not all of these features may be available on the models you are considering, insist on antilock brakes, ESC, side and side-curtain air bags on your next car.



NADA Chairman  
Annette Sykora on the  
set with *SeeMore*.

## NADA Takes Child Passenger Safety Message to Public Television

NADA and *SeeMore's Playhouse* have created public service announcements on child passenger safety. *SeeMore's Playhouse*, a 30-minute children's show, reaches about 60 million homes each week on public television. NADA members have inspected about one million child safety seats since its campaign began six years ago.



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