

GUIDE TO PURCHASING
Fuel Efficient
Vehicles



What this guide can do for you.

Many vehicles that are highly fuel efficient are available in dealer showrooms today, and can accommodate a range of uses and lifestyles. But knowing what to look for and understanding what makes a vehicle more fuel efficient (or less so) may not always be obvious. This guide is a resource to help you sort through the options and find the most fuel efficient vehicle that meets your needs.

Topics covered in this guide include:

- The financial and environmental benefits of fuel efficiency.
- Future improvements expected in fuel efficiency.
- Information about fuel efficiency that can help you make better choices when purchasing a new vehicle, including:
 - Vehicle size;
 - Vehicle price;
 - Vehicle ownership costs;
 - Vehicle safety;
 - Vehicle brand, model and type;
 - Vehicle accessories;
 - Engine size and type;
 - Transmission; and
 - Advanced technologies.
- Where to find information about fuel efficiency levels for new vehicles (and older models, too!).
- Understanding fuel consumption labels on new vehicles.
- Tips for keeping your vehicle's fuel efficiency at optimal levels when driving.
- Responsibly retiring your old vehicle.



So you are thinking about buying a car...

Your car provides you with freedom to travel on your own schedule, to run errands, commute to work and visit friends or family. But the more you drive, the more fuel your car burns. When gasoline or diesel is burned in your car, it produces greenhouse gases (GHGs) that are emitted from the exhaust pipe.

In fact, cars are one of the largest sources of transportation-related GHG emissions in Canada. But you can make vehicle purchase and driving decisions that help to reduce these impacts. There are many simple ways to use less fuel without giving up the freedom, mobility, and access to services that cars provide.

You can reduce the amount of fuel you use by taking public transit, walking or cycling instead of driving. But, given the distances many of us travel on a daily basis, a car is often the most practical option for getting around.

Benefits of fuel efficiency

Finding a car that fits your lifestyle and uses less fuel not only benefits the environment, but can also save you money.

Financial benefits of fuel efficiency:

- Fewer trips to the gas station are needed.
- Fuel savings accumulate over the life of the vehicle, lowering the overall cost of car ownership.
- Insurance and maintenance costs on many fuel efficient models are often lower than average.
- Resale value of a fuel efficient vehicle is often higher than that of a less efficient vehicle.

Environmental benefits of fuel efficiency:

- By reducing our need for fuel, we can reduce our dependency on non-renewable energy sources, such as oil (which is made into gasoline and diesel).
- By using less fuel to drive, we can reduce emissions of GHGs and other harmful pollutants.

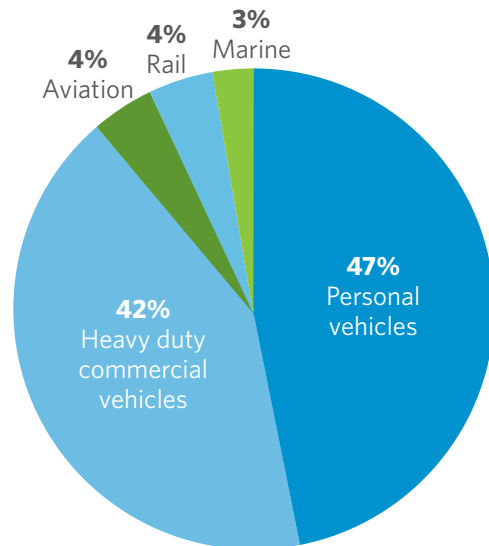
The fuel efficiency of new vehicles is improving

Concerns about climate change and the economy have motivated the Government of Canada to regulate GHG emissions from new vehicles. New rules will limit emissions of GHGs from new cars and light trucks beginning with the 2011 model year, and will become stricter each year to 2016.

To comply with the regulations, car makers will need to make all their vehicle models – both large and small – more fuel efficient in future model years.

Did you know?

Personal automobile travel contributes almost one half of Canada's total transportation-related GHGs.



Transportation GHG emissions in Canada
Categorized by modes of transport

DISPELLING MYTHS about fuel efficient vehicles:

Fuel efficient vehicles are safe

Fuel efficiency is available in a wide range of vehicle types and sizes

Fuel efficient vehicles do not cost more to purchase or maintain

What are your needs?

A vehicle that you cannot use is no help to you, no matter how fuel efficient it is. However, for each type of vehicle that does work for you, there exist models that are more fuel efficient, and those that are less. Often for each model, there are various technology options and features that can significantly contribute to better fuel efficiency, or detract from it.

You need a vehicle of a certain size...

Think you need to buy the smallest car on the lot to save gas? Think again! Of the ten most fuel efficient vehicles available in Canada in the 2010 model year, only half of the models are compacts or smaller in size. There are also four mid-size sedans, a hatchback wagon and two luxury brands.

Top ten fuel efficient 2010 vehicles sold in Canada

1. TOYOTA PRIUS (mid-size)
2. HONDA CIVIC HYBRID (compact)
3. HONDA INSIGHT (compact)
4. FORD FUSION HYBRID (mid-size)
5. SMART FORTWO (two-seater)
6. TOYOTA CAMRY HYBRID (mid-size)
7. LEXUS HS 250h (compact) tie with
8. NISSAN ALTIMA HYBRID (mid-size)
9. AUDI A3 TDI (wagon) tie with
10. VOLKSWAGEN GOLF TDI (compact and wagon models)

Did you know?

New cars, minivans, SUVs and pickup trucks will, on average, consume 25 per cent less fuel in 2016 than they did in 2008, thanks in part to new GHG emission regulations.

Most compact and mid-size cars offer more than enough space to seat four or five adults comfortably, and the space available for cargo has improved remarkably in the past decade. Innovative trunk space design and fully folding seats enable a surprising range of carrying capacity.

When thinking about the space you need, consider the primary use of the car. Are you commuting alone, or with just one passenger? Perhaps all you need is a subcompact or a two-seater model. If you need to carry more people or cargo, but only occasionally, simply renting a larger car for those times might be more economical. Buying a much larger vehicle than your daily needs warrant, simply to accommodate the rare occasion on which you need more space, could end up costing you much more in fuel.

If a larger vehicle is, in fact, what you need, consider the most fuel efficient option in that size class. Many large vehicles are, despite their size, surprisingly fuel efficient, especially if made with lightweight materials, such as high-strength steel, aluminum or composite materials and plastic. The lighter a vehicle is made, the less fuel it needs to accelerate. Lightweight materials allow a larger vehicle to be more fuel efficient without compromising safety or performance.

Heavier cars, on the other hand, tend to need larger engines that consume more fuel, to generate the power needed to haul their mass. In fact, until recently, cars weighing over a certain amount were subject to a federal "gas guzzler" tax.

SUVs are not the only option if space is what you need!

There is more interior room and seating space in a minivan than in most SUVs, and minivans are often much more fuel efficient. But if an SUV is what you want, consider models with 4-cylinder engines, compact SUVs, 'crossover' utility vehicles or station wagons.



Fuel efficiency comes in all shapes and sizes!

A vehicle's weight substantially impacts its fuel efficiency level, but the size of a vehicle is not always an accurate indicator of its weight. Some large cars are designed to be relatively light for their size, so less energy is needed to accelerate. This means that smaller engines, which consume less fuel, can deliver the performance you expect. So, a smaller engine can sometimes be a better indication of good fuel efficiency than vehicle size.

You need a fuel efficient vehicle that is within your budget...

Purchase price is one of the most important factors people think about when buying a new car. Good fuel efficiency is a performance feature common among many lower-priced models. However, it is true that highly fuel efficient vehicles are often more technically advanced and, therefore, more expensive. The fuel saved while driving these vehicles over time helps owners to recover the cost of the higher purchase price, as do other benefits of owning a fuel efficient vehicle, as listed below.

Lowering the cost of fuel efficient vehicles through rebates and incentives

The following table summarizes the current financial incentives encouraging you to purchase a new, fuel efficient vehicle (and the disincentives to purchasing an inefficient vehicle).

Scope	Name	Detail
Federal	Canada Revenue Agency Excise Tax (Green Levy) on Fuel Inefficient Vehicles	An excise tax applies to the purchase of certain new passenger automobiles. Vehicles that consume 13 or more litres per 100 km on average are subject to a tax between \$1,000 and \$4,000.
Provincial	Ontario Electric Vehicle Incentive Program	Starting July 1, 2010, financial incentives for the purchase or lease of new plug-in hybrid electric vehicles, battery electric vehicles, or fuel cell electric vehicle range between \$5,000 and \$8,500 depending on the size (in kWh) of the battery the vehicle uses. The rebate applies to the first 10,000 qualified applicants.
	Manitoba's Hybrid Electric Vehicle Rebate	Manitoba residents who purchase and register a new hybrid vehicle in Manitoba are eligible for a \$2,000 rebate.
	Prince Edward Island PST Rebate	Since 2004, a PST rebate of up to \$3,000 has been available with the purchase of a new hybrid electric vehicle.
Private	Employee Rebates and Incentive Programs	Various businesses across Canada offer different financial motivations to their employees to purchase and/or drive a fuel efficient car. Check with your employer to see if such offers apply to you.
	Preferred Loan Rates	A number of organizations offer preferential loan rates towards the purchase of a qualified fuel efficient vehicle. Consult your local credit union or loaning agency to inquire about these types of programs.
	Vehicle Manufacturer Factory Rebates	Depending on the season, vehicle manufacturers often offer factory rebates. Look in your local newspaper or on the manufacturer's website for promotions going on when you are looking to purchase.



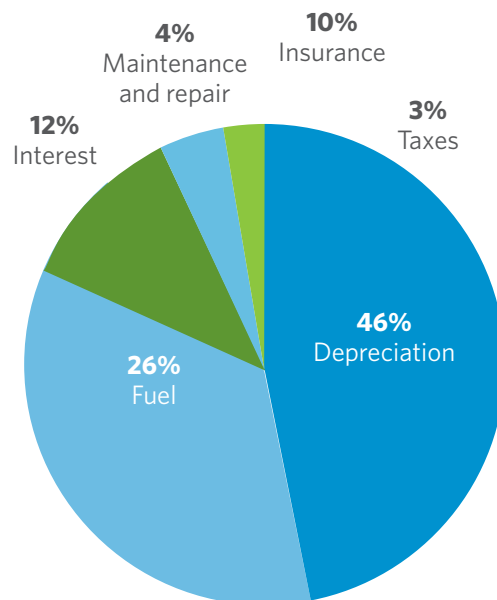
The cost of ownership and fuel efficient vehicles

The cost of owning a vehicle includes more than the purchase price. On a yearly basis, owning a vehicle means you are paying for maintenance and repair, tax, depreciation, fuel, interest and insurance. For a fuel efficient vehicle, many of these expenses can be lower, making the total cost of ownership less. Read below to find out why.

Resale value of fuel efficient vehicles

Let's say a new car is worth \$20,000 brand new, but after five years of use, you can only get \$10,000 for it on the used car market. That means its value has "depreciated" by half. All cars depreciate over time, but some lose their value faster than others. The Automotive Lease Guide (ALG) reports the depreciation rates for various models over the lifetime of ownership. A rating of five stars indicates that a model depreciates very slowly, holding its value for longer period of time. This means you recover more of the vehicle's value when you sell or trade it in (this amount is called, "residual value").

According to the ALG, the most fuel efficient vehicles in Canada also have some of the lowest depreciation rates. Of the ten most fuel efficient vehicles available for sale in Canada in 2010, nearly all were rated at four stars or higher. On the other hand, SUVs and trucks with the highest fuel consumption in their class have some of the highest depreciation rates.



Breakdown of ownership costs over the first five years
(Consumer Reports)

Insurance and fuel efficient vehicles

Smaller, less expensive and more fuel-efficient cars generally cost less to insure than larger, more expensive and more powerful cars. Some Canadian insurers will discount your auto insurance premium by approximately 10 per cent if you drive a hybrid vehicle.

Maintenance and fuel efficient vehicles

Though some highly fuel efficient vehicles, such as hybrids, use advanced technology, regular maintenance can cost less than the average. Why?

- The engines in hybrid cars tend to idle less and operate under less stress because their electric motors share the load.
- Hybrid vehicles use "regenerative braking" to slow down. The braking force is provided, in part, by the electric motor, so the brake pads experience less wear. Therefore, the brake pads don't need to be replaced as often as in vehicles with conventional braking systems.

Fuel efficient vehicles can also get breaks on parking costs...

Certain cities and retailers (City of Kelowna and IKEA Canada are two examples) offer free parking or preferred parking spots for highly fuel efficient vehicles. Check with your municipality or local businesses for details.

Fuel efficiency and depreciation ratings for 2010 Models

Vehicle models with higher fuel efficiency ratings	ALG depreciation rating	Name	ALG depreciation rating
Toyota Prius	★★★★★	Hummer H3	★★
Honda Civic Hybrid	★★★★★	Dodge Ram	★★★
Honda Insight	★★★★★	Dodge Dakota	★
Ford Fusion Hybrid	Not rated	GMC Sierra	★★★
Smart ForTwo	★★★★★	Chevrolet Silverado	★★★
Lexus HS250h	★★★★★	GMC Yukon	★★
Toyota Camry Hybrid	★★★★★	Mercedes-Benz G Class	★★
Audi A3 TDI	★★★★★	Chevrolet Tahoe	★★
Nissan Altima Hybrid	Not rated	Chevrolet Suburban	★★
Volkswagen Golf TDI	★★★★★	Chevrolet Avalanche	★★
Toyota Yaris	★★★★★	Porsche Cayenne	★★

Vehicle retirement

If you are buying a new, fuel efficient car as a replacement for an older, less fuel efficient model, you can do so in an environmentally responsible and financially rewarding way.

Older vehicles tend to be less fuel efficient and do not have the latest technology that helps to reduce emissions of harmful pollutants. New vehicles are designed with advanced emission controls, more efficient engines and lighter materials. By retiring vehicles earlier, you'll be helping to reduce harmful emissions and fuel use. Vehicle retirement and recycling programs encourage vehicle owners to get their vehicles off the road and have them recycled in a responsible way by offering financial incentives and rewards. Responsible recycling prevents cars from going directly to the landfill and releasing hazardous materials into the air, ground and water.

The national vehicle retirement and recycling program, *Retire Your Ride*, offers a number of financial incentives in exchange for 1995 or older model year vehicles that are in running condition. In return, the vehicle owner can receive a number of benefits, such as \$300 cash, a transit pass, a discount off the purchase of a bicycle, a membership in a car sharing program, or a discount on a new or used vehicle. Certain automotive partners in the program also offer additional financial incentives toward the purchase of a new vehicle. Retiring your older, more polluting vehicle through a program, such as *Retire Your Ride*, and replacing it with a new, more fuel efficient model can save you money and help to reduce harmful vehicle emissions.

You are concerned about safety...

Some people think that fuel efficient vehicles are unsafe - but this is not the case. All vehicles on the road must meet Transport Canada's vehicle safety standards.

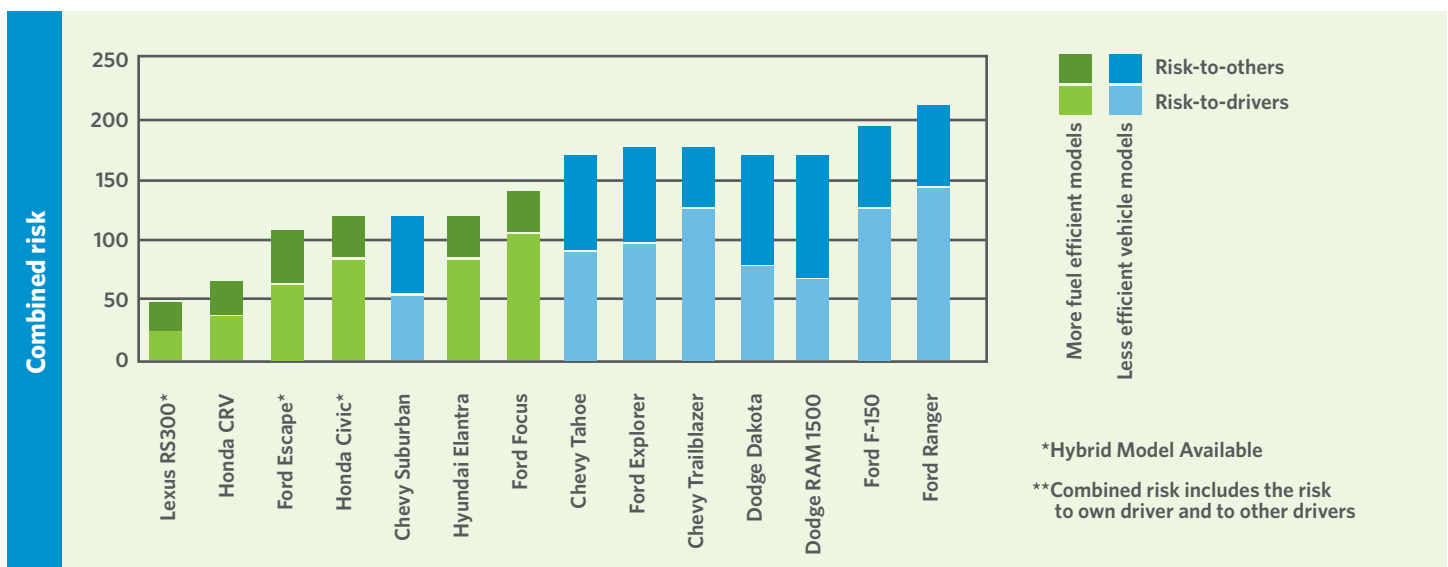
Safety is a priority in vehicle design. Today's vehicles are increasingly well equipped to protect their occupants in the event of a collision thanks to:

- Structures that are designed to collapse and absorb the energy of an impact (i.e., "crumple zones");
- Passenger compartments that resist crushing; and
- Seatbelts and airbags (i.e., "supplemental restraint systems", or SRS).

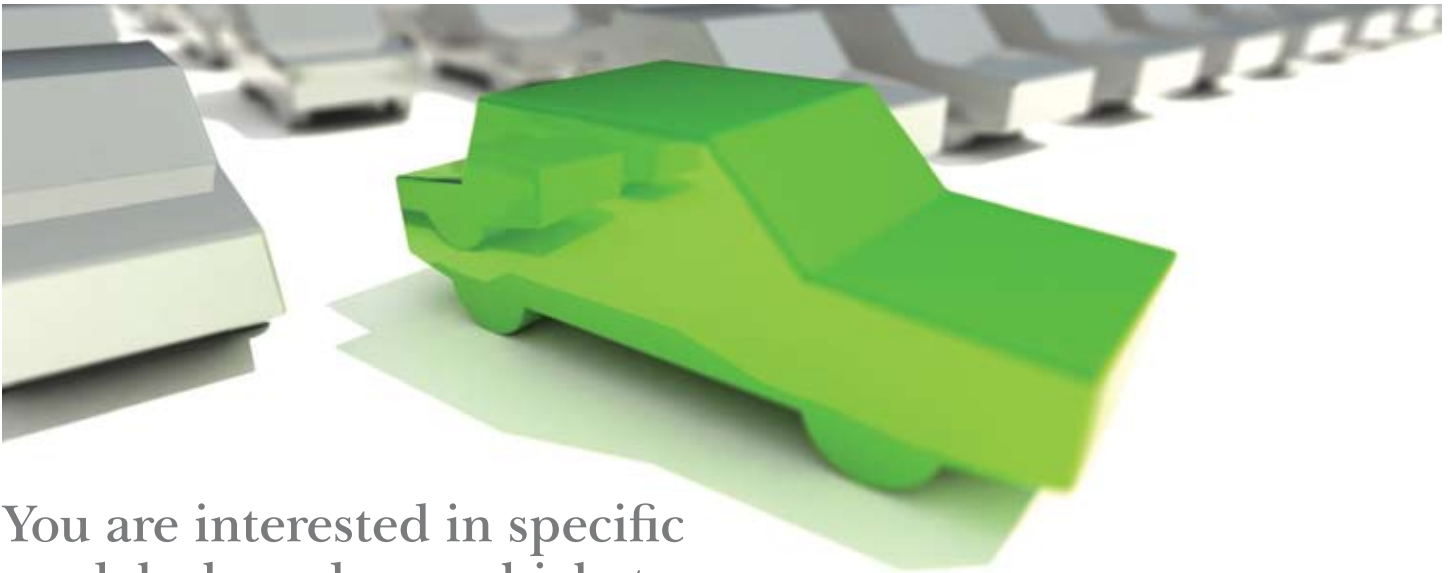
Statistical analysis of vehicle collisions data in the U.S. indicates that reducing vehicle weight while maintaining vehicle size (width and length) can help to reduce injuries in highway accidents. This is one reason why the new federal fuel economy regulations in the U.S. do not promote the sale of smaller vehicles, but rather encourage reducing the weight of vehicles, without reducing size, as a way to improve fuel efficiency. New GHG emissions regulations in the U.S. and in Canada follow a similar size-based format, promoting lightweighting, but not downsizing, in new vehicle fleets.

Safety risks of vehicles with high and low fuel economy

(Wenzel and Ross, 2006)



Recent studies have found no relationship between the fuel efficiency of vehicles and the risk of injury in a collision. If you aren't sure, always check the fuel efficiency and safety rating of a vehicle before making your purchase. Not sure where you can find information on vehicle safety ratings? Check the manufacturer's website or ask your dealer.



You are interested in specific models, brands or vehicle types...

Multiple fuel efficient options exist within each vehicle class. To demonstrate this, the three most fuel efficient vehicle models in each class are listed in the table below (for the 2010 model year). As you can see, there is a wide variety of models and brands for you to choose from that offer superior fuel efficiency compared to other vehicles on the road.

Most fuel efficient 2010 vehicles in Canada by class			
Cars		Light trucks	
Two-seater	<ol style="list-style-type: none"> 1. Smart Fortwo 2. Mazda MX-5 3. Audi TT Roadster Quattro 	Pickup Truck	<ol style="list-style-type: none"> 1. Ford Ranger 2. Mazda B2300 3. Toyota Tacoma
Subcompact	<ol style="list-style-type: none"> 1. Toyota Yaris 2. Mini Cooper 3. Honda Civic 	Special Purpose Vehicle	<ol style="list-style-type: none"> 1. Ford Escape Hybrid 2. Lexus RX 450h 3. Toyota Highlander Hybrid
Compact	<ol style="list-style-type: none"> 1. Honda Civic Hybrid 2. Honda Insight 3. Lexus HS 250h 	Van	<ol style="list-style-type: none"> 1. Mazda5 2. Toyota Sienna 3. Chrysler Town & Country
Mid-size	<ol style="list-style-type: none"> 1. Toyota Prius 2. Ford Fusion Hybrid 3. Toyota Camry Hybrid 	Large Van	<ol style="list-style-type: none"> 1. Chevrolet Express Cargo 2. GMC Savana Cargo
Full-size	<ol style="list-style-type: none"> 1. Hyundai Sonata 2. Honda Accord 3. Chevrolet Impala 		
Station Wagon	<ol style="list-style-type: none"> 1. Audi A3 TDI 2. Volkswagen Golf Wagon TDI Clean Diesel 3. Honda Fit 		

Did you know?

In addition to a higher vehicle purchase price, extra power-consuming features, such as air conditioning and in-vehicle entertainment systems, can also significantly increase fuel consumption by drawing power from the engine.

You don't want to sacrifice comfort for fuel efficiency...

Most new cars offer a wide array of additional options. Accessories, aftermarket additions and power-assist features can increase fuel consumption by adding weight or reducing the aerodynamics of the vehicle.

Do you really need these features?

When purchasing a vehicle, think about whether the comfort or convenience provided by these add-ons is worth the increase in fuel consumption, emissions and purchase price.

Power and heated seats:

Power seats are heavier than regular seats and impact the fuel consumption of your car by up to three per cent.

Other power equipment:

Features like fog lights, power windows, sunroofs and power mirrors add weight to the vehicle and draw power from the engine when operating.

Remote car starters:

While remote car starters may be convenient, but running the car at idle wastes fuel and money.

Air conditioning:

Air conditioning increases the purchase price and, when being used, the fuel consumption of a vehicle. Using the air conditioner can increase fuel consumption by 20 per cent or more in city driving situations. If you choose to include A/C in your vehicle, try to limit its use. If an automatic climate control system is included in a vehicle you are interested in purchasing, try to limit its use. If possible, run it in "economy" mode. Air conditioning booster systems for the rear seats are sometimes offered in passenger vans. Ask if the system consists of a second air conditioning unit. An additional air conditioning unit can significantly increase fuel consumption.

You are looking for more ways to improve fuel efficiency...

What about diesel engines?

You may want to consider a diesel-powered vehicle instead of a gasoline-powered vehicle for the following reasons:

- Diesel engines are more efficient at converting energy stored in the fuel into useful work than gasoline-powered engines.
- You may spend less on fuel, as gasoline and diesel are sold at a similar price per litre, but your diesel engine consumes less per kilometre travelled.
- Currently available diesel-powered vehicles perform comparably to gasoline engines in terms of noise, winter starting and acceleration performance, but consume 30 per cent less fuel and produce 20 per cent fewer GHG emissions.

Front-wheel drive and fuel efficiency

Front-wheel drive systems are compact and add less weight to a vehicle than rear-wheel, four-wheel and all-wheel drive systems. Front wheel drive is the most fuel efficient, and often least expensive, option.

Rear-wheel drive results in a heavier and often more expensive car as compared to front-wheel drive. The added weight impacts fuel consumption, but rear-wheel drive is still better on gas than four-wheel or all-wheel drive systems.

Four-wheel drive and full-time all-wheel drive systems offer exceptional traction in off-highway conditions, but come with a big fuel consumption penalty due to the extra weight they add to the vehicle. Usually found on pick-up trucks and SUVs, these systems can improve acceleration in slippery conditions, but they do not necessarily improve safety or assist with braking. Whereas, the use of anti-lock braking systems, as well as electronic stability and traction control, can improve safety without substantially increasing weight and fuel consumption.

Improving fuel economy by driving smart: Eco-driving

Eco-driving is about conserving fuel by driving in a safe and efficient manner. One of the first principles of eco-driving is using the most fuel efficient automobile that meets your needs. So by purchasing a fuel efficient vehicle, you are already eco-driving!

Other principles of eco-driving include:

Follow maintenance schedules

Don't idle

Keep your trunk light

Minimize use of accessories

Remove the roof rack when not in use

Reduce speed

Check tires regularly

Plan trips wisely to minimize the distance travelled

Adjust your driving style - don't accelerate quickly or brake hard

Use cruise control where appropriate

Use a block heater or auxiliary heater in cold weather

Small engines versus large engines

How much power do you really need for the majority of your driving?

Passenger cars with smaller engines tend to deliver better fuel efficiency than those with larger engines. Under normal driving conditions, smaller engines tend to operate closer to their most efficient speed more of the time.

That does not mean that a bigger engine is never a good choice. If you often tow heavy loads, for example, a small engine may burn more fuel because it must operate outside its most fuel-efficient range. In this case, a larger, more powerful engine may be the more fuel-efficient option.

Automakers use a variety of technologies to increase the power output of a smaller engine without sacrificing small-engine efficiency:

- Turbochargers and superchargers can increase engine efficiency, squeezing more power out of each drop of fuel;
- Hybrid systems couple an electric motor to the engine, effectively increasing the overall power output of the system;
- If towing capacity is needed, a small diesel engine can meet the demand for torque more efficiently than a larger gasoline engine.

Larger engines consume more fuel than equivalent vehicles of the same size/class

(Pollution Probe)

Vehicle	Engine size	Annual fuel consumption	Difference in fuel consumption between two engine sizes
Compact Car	1.8 litre (4 cylinder) 2.0 litre (4 cylinder)	1,300 litres 1,734 litres	434 litres
Mid-size Car	2.4 litre (4 cylinder) 3.6 litre (6 cylinder)	1,641 litres 2,044 litres	403 litres
SUV	3.7 litre (6 cylinder) 5.7 litre (8 cylinder)	2,438 litres 2,752 litres	314 litres
Pickup Truck	4.6 litre (8 cylinder) 5.4 litre (8 cylinder)	2,668 litres 2,881 litres	213 litres

How many cylinders should your engine have?

To reduce fuel consumption and emissions, consider a four-cylinder engine instead of a six-cylinder engine, or six-cylinder instead of an eight-cylinder engine, where the option exists. Depending on the choice of model and transmission, you could reduce your fuel consumption by approximately 10 per cent by choosing a four-cylinder engine over a six-cylinder model.



Did you know?

Engines today are more efficient at converting the energy supplied by the fuel into motion, thanks to improvements in technology and engine design. Engines are also more powerful. In fact, vehicles today have twice the horsepower of those sold twenty years ago. Today, the power available in a subcompact car is greater than that of many mid-size sedans sold in the mid-1980s.



Engine technology options

Engine technologies to look for when researching your new vehicle purchase are listed in the table at left; along with the potential fuel savings they can offer. Look for the transmission option that minimizes fuel consumption and keeps the engine at its optimal operating range. Depending on your skill and level of comfort with “driving stick”, a manual transmission, may be best for you. However, newer automatic transmissions can deliver comparable (or even better) efficiency to manual transmissions for the average driver who is not conscientious about fuel efficient shifting techniques.

Manual transmission:

Vehicles with manual transmissions can use 5 to 10 percent less fuel than automatic transmissions when used correctly. Optimal highway fuel efficiency can generally be obtained with a manual transmission. The manual advantage tends to be greatest on smaller, lighter cars with four-cylinder engines.

Automatic transmission:

For city driving, or for drivers who are inexperienced with manual shifting, automatic transmissions may be a better choice.

Transmission technologies and fuel savings:

Beyond the choice between manual and automatic, there are transmission technology options available that can reduce the fuel consumption of your vehicle by up to 7 per cent. Use this table as a guide for things to look for when researching your new vehicle purchase.

Incorporate some electric power into your new vehicle

Electric power and drive systems are increasingly available in new vehicle models, making big fuel savings possible.

Electrically powered accessories:

Vehicle accessories, such as power steering and water and oil pumps, are usually mechanically driven by the engine. This diverts power needed for the wheels, and causes the engine to work harder and consume more fuel. In some new models, the accessories are driven by small electric motors, which consume less energy and draw power only when being used.

Higher voltage systems:

Conventional vehicles have 12-volt systems but higher voltage systems (like 42-volts) can support more electrical loads; meaning more accessories (such as air conditioning) can be powered off of electric energy, rather than the engine.

Idle-off and launch assist:

In a vehicle equipped with an electric motor, this feature allows for the engine to shut off when the vehicle comes to a stop (thus conserving fuel). The electric motor then helps to get the vehicle moving again when the driver presses the accelerator.

Regenerative braking:

In a vehicle equipped with an electric motor and sufficient battery capacity, regenerative braking is used to slow down. When the driver applies the brakes, the electric motor turns in reverse, acting as a generator that charges the battery while the vehicle slows down.

Engine technology	Fuel consumption reduction potential
Variable Valve Timing <i>VVT - also known as Cam Phasing</i> This optimizes the flow of fuel into (and exhaust out of) the engine over a range of operating conditions	Up to 3%
Variable Valve Lift <i>VVL - Similar to VVT</i>	Up to 2%
Camless Valve Actuation Electronic controls allow for more precision and reduced load on the engine	Up to 12%
Turbocharging Good way to boost the power output of smaller engines that consume less fuel	Up to 7%
Cylinder Deactivation Allows fewer cylinders to be used when not needed in eight- and six-cylinder systems	Up to 6%
Gasoline Direct Injection <i>GDI - Allows for more efficient use of fuel and results in higher engine power</i>	Up to 6%
High Speed Direct Injection Diesel <i>HSDI - Significantly reduces engine emissions, offers superior combustion control and reduces vibration</i>	Up to 25%

Tips for manual shifting to maximize fuel economy

*Shift at lower engine speeds
(between 1,000 and 2,500 RPMs)*

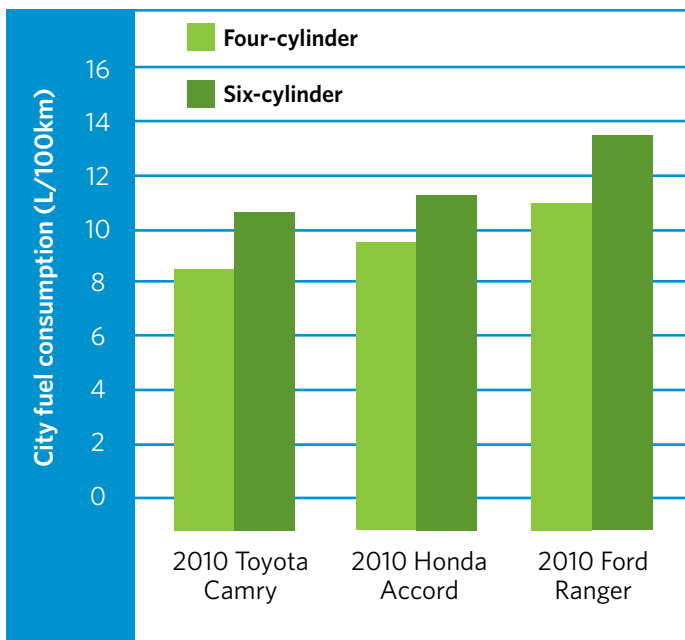
Keep RPMs low when disengaging the clutch and starting to move forward

*Avoid engine braking
(i.e., gearing down to slow the car)
use your brake pads instead*

*Start in a higher gear
(i.e., second, rather than first)*

Did you know?

In addition to a higher vehicle purchase price, extra power-consuming features, such as air conditioning and in-vehicle entertainment systems, can also significantly increase fuel consumption by drawing power from the engine.



You can consume less fuel by using a four-cylinder vehicle instead of one with six cylinders
(Natural Resources Canada)

Hybrid-Electric Vehicle (HEV):

A gasoline motor is assisted by an electric motor and a battery pack that is recharged during regenerative braking. The electric motor draws electricity from the battery pack to supplement engine power, or to fully power the vehicle without the engine for short periods (usually when the vehicle is at idle or cruising at low speed).

Plug-in Hybrid Electric Vehicle (PHEV):

PHEVs have a design that is similar design to HEVs. One major difference is that the battery in these vehicles can be charged from an electric outlet when parked and through regenerative braking when driving. Compared to HEVs, PHEVs are able to travel at higher speeds and for extended distances without using the combustion engine.

Extended Range Electric Vehicle (EREV):

An EREV is a special category of plug-in hybrid that operates solely on stored electricity until the battery is depleted. Only then does the EREV use the combustion engine as an auxiliary power source.

Battery-Electric Vehicle (BEV):

The combustion engine and fuel tank of a conventional vehicle are replaced with an electric motor and a rechargeable battery pack. The electric motor provides 100 percent of the power to move the vehicle. The battery can be charged by being plugged into an electrical outlet when parked and using regenerative braking when driving.

Additional options to improve fuel efficiency

Optional features that can help to improve fuel efficiency can be added to vehicles, without significantly increasing the purchase price.

Auxiliary heater:

The auxiliary heater is like a tiny furnace, with its own fuel line to the gas tank. By burning a small amount of fuel, it can keep the engine warm without having to idle. In cold weather, the engine is then able to operate efficiently and with fewer emissions in less time.

Block heater:

A block heater heats the engine block and allows you to start the engine when it is semi-warm. By helping the vehicle start in cold temperatures and also helping to warm up the vehicle's interior more quickly, a block heater can improve overall winter fuel economy by as much as 10 percent.

Tinted glass:

This option can help block some sunlight from entering through the windows and heating up the passenger space, reducing the need for air conditioning. Check with local authorities regarding car window tint laws in your area.

Aluminum wheels:

Aluminum wheels are lighter than the traditional steel used in most vehicles. This reduces weight and, therefore, fuel consumption. Check with a trusted dealer about the suitability of aluminum wheels on the vehicle you choose to buy.

Cruise control:

Using cruise control helps to save fuel during highway driving by maintaining a consistent speed and encouraging eco-driving.

Tachometer:

A tachometer indicates engine speed. If you are purchasing a car with a manual transmission, a tachometer can help you know when to shift gears and keep the engine at its most fuel efficient speed. Some automobiles are equipped with a shift indicator light, which also identifies the optimal shift points.

'Real-time' fuel consumption gauge:

A fuel consumption gauge is a programmable computer that gives you information like fuel consumption, fuel cost-per-km, coolant temperature, engine speed, horsepower, idling time and more. This type of feedback can help you improve your driving habits and save fuel.

Removable roof rack:

Rather than having a permanently installed roof rack, consider one that is removable. With a removable rack, you can limit the aerodynamic impact on fuel consumption by only using it when you need it and removing it when you don't. Consider also how a removable roof rack can temporarily increase your cargo capacity, possibly enabling you to purchase a smaller car.

Trip computers, navigation systems or GPS:

These devices encourage efficient driving (i.e., direct and efficient routes from A to B), which reduces the amount of kilometres travelled (and therefore fuel consumed) for a given trip.

Why is fuel consumption lower for highway driving than city driving?

Accelerating a vehicle consumes more fuel than maintaining a constant, moderate speed. Since city driving involves more accelerating and braking (stopping and going at stop lights, slowing at turns), it usually consumes more fuel than highway driving, in which constant speeds are maintained.



You need more information...

Natural Resources Canada's Office of Energy Efficiency provides a Fuel Consumption Guide, which lists the fuel consumption ratings of various makes and models available in Canada for a given model year. If fuel efficiency is important to you, the fuel consumption rating is the most important piece of information that you need.

To access this guide, visit:

<http://oee.nrcan.gc.ca/transportation/tools/fuelratings/fuel-consumption-guide-2010.pdf>

The Fuel Consumption Ratings Tool, provided by Natural Resources Canada, can be used to select and compare different makes and models and rank the fuel efficiency of vehicles sold in Canada.

To access the tool, visit:

<http://oee.nrcan.gc.ca/transportation/tools/compare/compare-search-one.cfm>

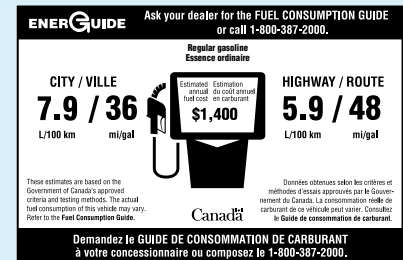
The EnerGuide Fuel Consumption Label is found on new vehicles. The label shows city and highway fuel consumption ratings and an estimated annual fuel cost for that particular vehicle. This information is very valuable for comparing the relative difference in fuel consumption performance between vehicle models you may be considering.

For more information on the EnerGuide label visit:

<http://oee.nrcan.gc.ca/transportation/personal/buying/energuide-label.cfm?attr=8>

When reading the EnerGuide Fuel Consumption Label, note the differences between models for city and highway fuel consumption

Consider how your vehicle will be used: in stop-and-go city traffic, or in long trips at high speeds on the highway? The fuel consumption label offers information for both situations, and the differences can be surprising. The Toyota Yaris, for example, consumes much less fuel in city driving than the larger Toyota Corolla model, but not much less on the highway. This is because the Yaris is lighter, but taller, so it needs less fuel to accelerate, but it catches more wind on the highway. This is how the Fuel Consumption Label can be very informative.



	Toyota Yaris (subcompact)	Toyota Corolla (compact)
City fuel consumption (L/100km)	7.0	7.6
Highway fuel consumption (L/100km)	5.6	5.7

Hybrids often get similar ratings on the city and the highway, which demonstrates how efficient they are in all driving conditions.

The annual ecoENERGY Awards for Personal Vehicles is administered by Natural Resources Canada's Office of Energy Efficiency. Each year, this program offers awards for the most fuel efficient vehicles.

For more information, visit:

<http://oee.nrcan.gc.ca/transportation/personal/buying/energuide-winners.cfm?attr=8>

Auto\$mart is a program offered by Natural Resources Canada's Office of Energy Efficiency that teaches drivers about issues related to driving behaviour, safety, fuel efficiency and the environment.

For more information regarding Auto\$mart, visit:

<http://oee.nrcan.gc.ca/transportation/business/register.cfm?attr=16>

Reference documents used in the development of this guide

Canadians' Perceptions of Electric Vehicle Technology, produced by Pollution Probe in 2009, looks at current Canadian public awareness about and understanding of electric vehicle technologies.

Pollution Probe's Report, Public Option Research: Purchasing Fuel Efficient Vehicles in Canada, studies public knowledge and attitudes about fuel efficiency, explores where fuel efficiency plays into vehicle purchase decisions and discusses various public policy options.

Pollution Probe's 2009 publication, **Promoting and Sustaining Consumer Demand for Highly Fuel Efficient Automobiles**, suggests ways to raise the market demand for highly fuel efficient automobiles, technologies and designs.

Purchasing Fuel Efficient Vehicles in Canada provides a better understanding of consumer decision processes with regard to selecting fuel efficient vehicles.

Pollution Probe partnered with the Canadian Automobile Association (CAA) to produce a **Primer on Automobile Fuel Efficiency and Emissions**. The Primer is an educational tool for motorists, businesses, policymakers and the public to help them better understand what industry, government and individuals can do to reduce fuel consumption and emissions.



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