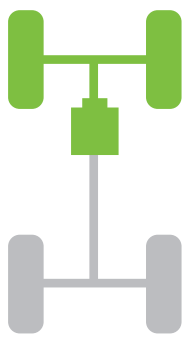


# Selecting the best drivetrains for your fleet vehicles

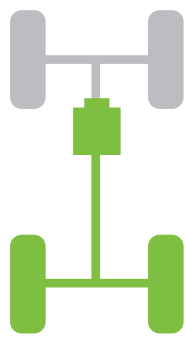


## Drivetrain Basics



FWD

Front-wheel drive (FWD) is the most common form of engine/transmission layout; the engine drives only the front wheels.



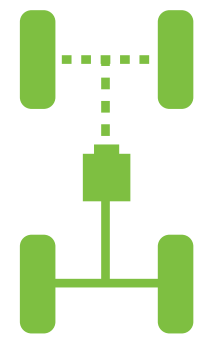
RWD

Rear-wheel drive (RWD) is regaining popularity due to consumer demand for performance; the engine drives only the rear wheels.



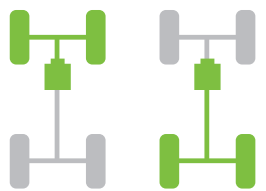
AWD

All-wheel drive (AWD) vehicles drive all four wheels. AWD is used to market vehicles that switch from two drive wheels to four as needed.



4WD

4WD generally requires manually switching between two-wheel drive for streets and a four-wheel drive for low traction areas.



Two-wheel drive (2WD) is used to describe vehicles able to power two wheels at most. For vehicles with part-time four-wheel drive (4WD), the term refers to the mode when 4WD is deactivated and power is applied to only two wheels.



Sedans | Minivans | Crossovers  
Generally FWD, RWD and AWD



Pickups | Full-Size Vans | SUVs  
Generally 2WD and 4WD





## Acquisition Cost

FWD	RWD	AWD	2WD	4WD
FWD less expensive due to fewer components and more efficient manufacturing	RWD can be more expensive due to more components and additional time to assemble	AWD generally most expensive due to more parts than FWD and RWD	4WD is more expensive than 2WD due to heavier-duty components	

Select vehicles based on intended function and operating environment rather than acquisition cost, as these factors largely dictate operating costs



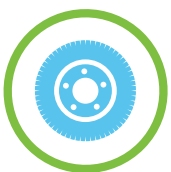
## Operating Expenses: Fuel Efficiency

FWD	RWD	AWD	2WD	4WD
FWD more efficient than RWD due to fewer, lighter parts and a more efficient drivetrain	More parts for RWD versus FWD vehicles means more weight and, subsequently, lower fuel efficiency	More parts for AWD versus FWD and RWD, so fuel efficiency is even lower	2WD gets better gas mileage than 4WD due to fewer parts and lighter weight	4WD applications, such as hauling, towing, or off-road driving, result in lower fuel efficiency  Friction from 4WD engagement further decreases fuel efficiency



## Operating Expenses: Maintenance

FWD	RWD	AWD	2WD	4WD
Some parts wear more quickly on FWD vehicles than RWD due to shorter FWD drive axles	RWD assembly is simpler than FWD and AWD and easier to maintain  Servicing wheel bearings and greasing transfer case can increase RWD preventative maintenance costs	AWD maintenance expenses generally higher than FWD and RWD due to more components	Placing a 2WD in a demanding application may result in higher maintenance expenses than a more suitable 4WD	4WD maintenance expenses generally higher
			Select the vehicle best suited to the intended use for lowest overall costs (e.g., 2WD better for primarily highway driving and normal conditions)	



## Operating Expenses: Tires

FWD	RWD	AWD	2WD	4WD
<p>Tire costs for sedans, minivans, and crossovers generally the same regardless of drivetrain</p> <p>Tire wear differs depending on powered wheels, following manufacturer tire rotation schedules is recommended to minimizing expense-per-mile</p> <p>Note: In the snow belt, snow tires improve safety and control for all vehicles but will increase total tire expense. In Canada, winter tires are recommended throughout the country during winter months, and they are mandatory in Quebec and British Columbia.</p>			<p>Tire cost/mile is generally more for 4WD due to more rugged applications/ snow conditions requiring specialty/ winter tires</p>	
			Tire selection for trucks, full-size vans, and SUVs depends on application more than drivetrain	



## Handling: Slick Conditions (Inclement Weather/Off Road)

FWD	RWD	AWD	2WD	4WD
<p>Generally greater traction for FWD versus RWD vehicles in gravel or wet, snowy, or icy conditions</p> <p>FWD braking more likely to cause a fishtail than just letting off the gas with RWD, but braking with RWD is just about as bad</p>		<p>AWD acceleration better than FWD or RWD, because all four wheels grip the surface</p> <p>AWD braking is slightly better than FWD or RWD</p> <p>AWD fine for moderate snow conditions or traveling on dirt roads, 4WD better for severe conditions</p>	<p>2WD vehicles perform similar to FWD or RWD vehicles depending on which wheels are drive wheels</p>	<p>4WD best suited for bad weather because of constant motion of all wheels at all times</p> <p>4WD more maneuverable in rough terrain</p> <p>4WD braking in adverse conditions is better – engine braking affects all four wheels</p>
<p>Stability control, traction control, and antilock brakes can mitigate poor handling characteristics</p>				



## Handling: Dry Conditions

FWD	RWD	AWD	2WD	4WD
<p>FWD's biggest disadvantage is torque steer, when the vehicle pulls to one side under hard acceleration</p> <p>FWD handling suffers as front wheels are trying to supply power and handle cornering simultaneously</p>	<p>RWD handles better than FWD due to increased weight over the drive wheels</p>	<p>AWD provides stable handling due to the combined benefits of FWD and AWD</p>	<p>If drive wheels are in the front or rear, 2WD vehicles will perform similar to FWD or RWD, respectively</p>	<p>4WD handles better due to more even weight distribution</p>



## Safety

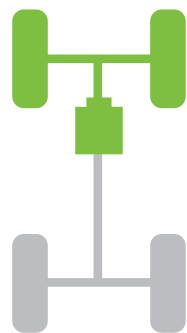
FWD	RWD	AWD	2WD	4WD
<p>More predictable handling with FWD</p>	<p>RWD more likely to fishtail</p>	<p>AWD provides stable handling due to the combined benefits of FWD and RWD</p> <p>Provides added traction when accelerating—but not when braking or cornering</p> <p>Can give drivers a false sense of security, leading to accidents</p>	<p>Same as FWD or RWD vehicles, depending on drive wheel location</p>	<p>Provides added traction when accelerating—but not when braking or cornering</p> <p>Can give drivers a false sense of security, leading to accidents</p>



# The Bottom Line

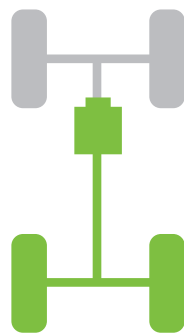


After considering everything above, your fleet vehicles should be equipped with the drivetrain that is right for your location and application. What follows is a high-level summary of when you should generally select each drivetrain:



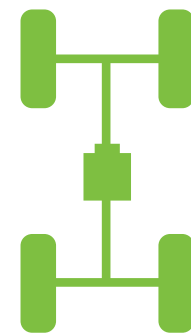
**FWD**

- Decent handling in slippery conditions
- Not optimal choice for towing or hauling applications
- Better fuel efficiency than RWD or AWD



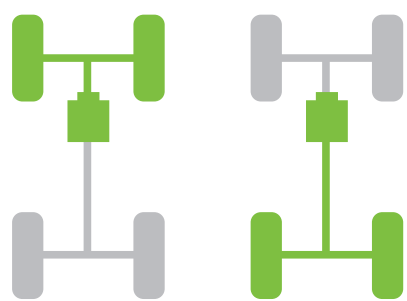
**RWD**

- Increased traction while towing or hauling
- Handling will suffer in slippery or snowy conditions
- Fuel efficiency ranges between FWD and AWD



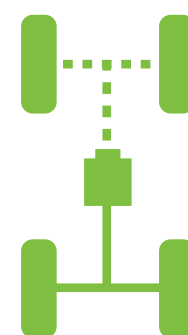
**AWD**

- Good all-around handling
- May not be worth additional up-front cost and running expenses if FWD or RWD will suffice
- Lower fuel efficiency than FWD or RWD



**2WD**

- Better suited for use primarily on pavement and outside the snow belt
- If hauling and towing are a priority, opt for 2WD with rear drive wheels
- Better fuel efficiency than 4WD



**4WD**

- Increased traction while towing or hauling
- Handling will suffer in slippery or snowy conditions
- Fuel efficiency ranges between FWD and AWD