

E-Bike Information Guidebook





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CLASSIFICATION SYSTEM

The Nova Scotia [Motor Vehicle Act](#) allows for two recognized classifications of e-bikes that do not require additional licensing to operate in Nova Scotia as of January 2025.

Class 1:

Class 1 e-bikes are operated much like a typical bicycle but feature a motor that kicks in to assist the rider. They are pedal assist only, requiring the rider to pedal for the motor to kick in as they lack a throttle. Class 1 e-bikes are limited to a 500W motor max and are capped at 32 km/h (20 mph). Once this speed is reached, the electric assist will cut out. The rider will still be able to exceed this speed, but it must be under their own power without the assistance of the motor.

Most major bike brands that produce e-bikes (Trek, Giant, Specialized, etc.) will be producing class 1 e-bikes, as it more closely emulates regular, unassisted cycling compared to a class 2 e-bike as outlined below.

Class 2:

Class 2 e-bikes are the second recognized classification of e-bikes that are considered street-legal in Nova Scotia without the requirement of additional licensing. A class 2 e-bike has all the same restrictions and requirements of a class 1, with the exception that a class 2 e-bike features a throttle (typically attached to the handlebar), often in addition to pedal assist, that allows for the operation of the motor without the rider needing to pedal the bike. You will mostly find class 2 e-bikes from smaller manufacturers which tend to focus exclusively on e-bike production, and they will typically have a lower starting price point as a result. Some class 2 e-bikes are designed to look more like motorcycles/ scooters; however, many will still look like a typical bicycle with a thumb throttle on the handlebar.



MOTOR TYPES

There are two main types of motor for e-bikes, hub-drive and mid-drive.

Hub-Drive:

The first main type of motor is the hub-drive motor. In this system, the motor is built into one of the wheels of the bicycle (typically the rear wheel).

The main advantage of this system is cost. Generally, hub-drive motors are much more affordable to manufacture, and as a result, bikes with this motor system typically come in at a much more accessible price point. They are also lower profile than mid-drive motors and as a result they are typically chosen for e-bikes that are designed to be disguised as regular bicycles to make them less attractive for thieves (popular choice for commuters who lock their bike regularly).

The main drawback with this system is that hub-drive bikes are generally more complicated to service (often making service more expensive), especially for flat repairs on the wheel containing the motor, as the motor must be disconnected from the bike to remove the wheel, which can be cumbersome. Hub-drive motors also have a reputation for being less smooth in their application of power when compared to a mid-drive motor, making the ride somewhat jerky which makes it more apparent that you are riding an e-bike.

Example of a hub-drive motor:





Mid-Drive:

The second main type of e-bike motor is the mid-drive motor. Mid-drive motors are generally positioned in the bottom bracket area of the bike, and the cranks are directly attached to the motor.

The pros of a mid-drive system are that they are easier to work on for general maintenance as the motor does not typically need to be disconnected to work on the bicycle components. They are also generally smoother in their application of power, which results in a smoother ride which feels more like riding a regular bicycle and less like you have a motor underneath you. They also typically generate more torque than a hub-drive motor which allows the rider to accelerate quicker (though this is not always the case).

The major drawback of mid-drive e-bikes is that they are typically more expensive to manufacture and as a result, they tend to start at a much higher and less accessible price point (though this is changing as time goes on and the market for e-bikes grows). Mid-drives are also more visible on the bike which makes it more obvious that the person is riding an e-bike, which may or may not be desirable depending on the use case.

Example of a mid-drive motor:





MOTOR SPECS

There will typically be two main motor specs to look out for when purchasing an e-bike, the first is power, and the second is torque.

Power:

E-bike motor power is typically expressed in watts (W). In Canada, e-bikes are not allowed to exceed 500W (as is the requirement for class 1 and 2 e-bikes) without additional licensing. The wattage of a motor will determine the maximum amount of energy that the motor will be able to provide to the rider at any given time.

Many brands will use their motor's power figures as a selling point however, it is arguably not the most important metric to assess the capabilities of an e-bike. While it is true that a 500W motor may be able to achieve a higher top speed than a smaller motor, the 32km/h speed limit imposed by the Canadian government limits the ability to utilize this additional power that the bigger motor may offer. In practice, this often means that smaller motors may actually *feel faster* to ride as a result of the second commonly advertised motor spec: **torque**.

Torque:

Torque refers to the twisting force applied to an object. On an e-bike motor, this is what determines the rate at which the bike can accelerate and is typically expressed in newton-meters (Nm). A motor's torque figures are generally independent of its power figures.

Due to the legislated speed limit of e-bikes in Canada, a motor's torque is far more likely to have a noticeable impact on how fast the bike *feels* when compared to power/ wattage. This is because many smaller motors still possess the capability to accelerate the bike and rider up to 32 km/h, the difference is that a higher torque motor will get you to that top speed much faster than a lower torque motor. The three exceptions to this rule are in situations where the rider is on a particularly hilly route, if the rider is a heavier individual, or if the bike is weighted down with heavy cargo. In this case, the required power to hit the speed limit may exceed the combined power output of the rider and a smaller motor in which case a more powerful motor may have a more noticeable impact on the speed capabilities of the bike.

Additionally, higher wattage, lower torque motors may operate less efficiently than lower wattage, higher torque motors which can result in greater battery consumption and lower overall range of the e-bike.



BATTERY SPECS

The capacity of e-bike batteries is typically measured in watt-hours (W/h). The W/h of a battery tells you how many watts it can supply to the motor for a one-hour period. For example: if you have a 500W/h motor and a 250W motor, the battery will be able to support the maximum output from that motor for two hours of run-time. Generally, a larger W/h battery is preferred by most riders, unless a smaller physical battery size is important to a purchaser in which case a smaller capacity battery may be preferable as it will be physically smaller and lighter on the bike itself.

It should also be noted that it is unlikely that a rider will be demanding the maximum output of the motor at all times during a ride, so you can expect the range to be further than it may appear if you divide the wattage of the motor by the watt/hours of the battery.

Often brands will express range in terms of kms, but it would be based on the expected run-time of the motor and battery under typical use and the average distance a cyclist will be expected to cover within that run-time. It is not a guarantee that you will be able to cover that distance on a single charge and a variety of factors will impact your range.

To put it simply, the more you demand from the motor, the faster your battery will drain.

Note:

When purchasing an e-bike it is critically important from a safety standpoint that you buy a bike that has a battery manufactured by a reputable battery manufacturer. This should not be an issue with most major bike brands, but for smaller e-bike manufacturers this is something worth researching. The main reason for this is accountability, as well as battery safety. A battery that is manufactured well should be quite safe, but one that is not can pose a significant fire risk. Reputable battery manufacturers have significantly more incentive to ensure a high level of quality control compared to a small/ off-brand manufacturers as they have a greater incentive to protect their brand reputation. If you can't find any info on the battery manufacturer, it may be best to look for a different bike.

NEVER LEAVE A BATTERY TO CHARGE UNATTENDED



MODEL SELECTION

With so many models to choose from it can be confusing and somewhat daunting to nail down exactly what would be best for you. Everyone typically wants a bike that can do everything incredibly well, unfortunately that doesn't really exist, and you will likely find that choosing a bike is a game of concessions. Outlined below are a few things to consider when purchasing a bike. Reach out to a bike shop and ask an employee about what would be best for you, they are there to help. This guide is no substitute for an experienced shop employee's advice.

Sizing:

Choosing a bike size for a personal bike can be a relatively streamlined process. It is recommended that you ask an employee of a reputable bike shop what size they would recommend for you based on your height and inseam. Be sure to inform them of any mobility concerns that you may have, and they should be able to tailor their recommendations to specific models that will be able to accommodate you better and make your riding experience as comfortable and fun as possible. An experienced shop employee should know their product line and fitment recommendations inside and out.

Choosing a bike size can be particularly challenging if you are looking to fit multiple people on the same bike. If you are a company, organization, or government body looking to buy bikes for the community, staff, or clients to use, you need to be sure to pick something that allows for a wide range of adjustment. One of the best options for this use case would be a **step-through** cruiser style of bike. These bikes have a lower top-tube allowing for people of all shapes, sizes, and ability to stand over it with ease, and they typically have adjustable stems and handlebars, allowing you to set the reach to fit a wider range of people than other styles may allow.

Step-through e-bike example:



Full-step e-bike example:





E-bike type:

Nailing down the best type of bike can also be quite challenging. Be sure to tell the sales associate what you are looking for in terms of range, torque, ride feel as well as the terrain that you are looking to ride on. E-bikes (and bikes in general) exist on a spectrum. On one end there is off-road e-bikes, and on the other there is on-road e-bikes, and there are lots of options in between. Generally speaking, if an e-bike is designed to work better on one side of the spectrum or the other, it comes with concessions on the opposite side. An off-road bike won't be ideal on-road and vice-versa.

The first question you should ask yourself is “where on this spectrum would I like to do the **vast majority** of my riding?”. A sales associate will be able to take this information and make recommendations as to what type e-bike they would recommend for your use case. However, bikes will generally fall into one of three different categories, *Gravel/ Hybrids*, *Road*, and *Mountain*.

Electric Gravel/ Hybrids:

If you are looking for something for general road, trail, and light off-road use, look for something with wider tires and maybe a little bit of suspension (though this may not be necessary). These bikes are called *e-hybrids* or *e-gravel bikes*, and they can come in step-through or full-step options depending on preference. You can also find different types of handlebars in this category with the term *hybrid* generally referring to bikes with a flat handlebar and *gravel bike* referring to a bike with a drop bar. They are the most common style of e-bike due to their versatility and are great for commuters and recreational cyclists alike.

Electric gravel/ hybrid bike examples:





If you are a company, organization, or government body looking to purchase bikes for your community, staff, or clients, step-through hybrids (with a flat handlebar) would likely be the best option when looking to buy an e-bike for communal use with multiple riders.

Electric Mountain Bikes (e-MTB)

If you would like to get something for rougher, off-road use, generally an *e-mountain bike* (e-MTB) would be ideal. These bikes typically have more suspension and bigger tires. They are capable of handling bigger rocks and roots at the sacrifice weight and pedaling efficiency, requiring more effort to ride on smooth terrain when compared to a hybrid. On an e-bike this inefficiency means that you will likely notice that the battery range will be lower on this type of bike.

Electric mountain bike examples:



If you want to explore rough trails and back roads and e-MTB would be a great option, but they are overkill for the groomed/ paved trail riding that the majority of cyclists are looking to do. They tend to favour the sport side of cycling over the recreational/ commuter side of cycling.



Electric Road Bikes:

For on-road use, an *e-road* would be the best choice (though *e-gravel* and *e-hybrids* would work too). Typically, these e-bikes are less capable when it comes to general purpose and off-road riding as they are tailored towards paved surfaces. The riding position of an *e-road* bike tends to be more forward-leaning and aggressive.

Electric road bike examples:



E-road bikes tend to favour the sport side of cycling rather than the recreational/ commuter side. They make bigger concessions on flexibility and off-road capabilities in exchange for being incredibly efficient on paved surfaces.

SAFETY, RULES, AND REGULATIONS

In Nova Scotia, both class 1 and class 2 e-bikes are subject to the same [rules of the road](#) that all cyclists must follow in addition to ensuring their compliance with the outlined class structure on *page 3*.

Additionally, if you plan on using your e-bike outside of Nova Scotia, be sure to read up on the regulations in place for your destination. While there are federal rules for how and when e-bikes may operate, the individual provinces also have their own rules that you must obey when visiting them.



As of 2025, the Nova Scotian government permits the use of class 1 and class 2 e-bikes anywhere that allows the use of non-motorized bicycles. However, these rules do not apply to privately owned or municipal properties which may have their own rules and bylaws in place that restrict or limit the use of e-bikes or specific classes of e-bike while on their property. Be sure to read up on the rules and regulations when going somewhere new.

Always wear a helmet when operating an e-bike.

Never leave a charging e-bike battery unattended.

Always pay attention and limit distractions when riding an e-bike.

Start slow. E-bikes can go very fast making it easy to hurt yourself or others if you are not confident in your ability to handle a bicycle.

Always ensure whoever is operating the e-bike is fully aware of how it works. This is especially important if you are offering e-bikes to a community, staff members, or clients on behalf of a company, organization, or government body.

REBATES

Electrify Nova Scotia:

E-bike purchases made by Nova Scotian residents, from a bike shop with a local store front may qualify for a \$500 rebate under the “Electrify Nova Scotia” rebate program. There are some specific requirements for a bike to qualify which are listed [here](#). Which should help to make e-bikes a more accessible option for Nova Scotians.

Note:

This section will be updated if any further rebate opportunities become available.



FREQUENTLY ASKED QUESTIONS

Why do the e-bikes have bigger tires than their non-electric counterparts?

Due to the assistance that the motor provides, there is generally little downside to using a bigger tire on an e-bike. Bigger, lower-pressure tires provide a more comfortable ride, better traction, and better puncture protection than narrower, higher-pressure tires. On a regular bicycle, bigger tires may marginally impact your rolling resistance and may make you slightly less efficient (though this has been debunked in recent years to a degree as well), but this is not an issue on an e-bike as the rider can simply increase the assistance level to counteract any inefficiencies that a slightly wider tire may introduce. **There is little benefit to going with super thin tires on an e-bike.**

Will/ should my e-bike recharge as I ride?

The short answer to this is no, an e-bike should not be able to recharge the battery as you ride.

While the technology does exist for electric cars, the energy is generated from the substantial braking forces generated when slowing the car down. The energy from this braking force is captured by the EV and is then recycled into the battery. The car does not regenerate any battery when accelerating or maintaining a constant speed.

To fit this technology onto a bicycle would not be feasible when manufacturing at the scale that a bicycle operates, the parts needed are too big and heavy. If a brand is advertising some sort of regenerative technology, they are likely doing it by adding a resistance unit on the bike that is always active which means you are always losing energy into the bike either making you work harder as a rider or making you use the motor more resulting in a drain on the battery. If you see a regeneration system advertised, it is worth inquiring how they are achieving it.

When should I get my e-bike serviced?

Think of e-bike service intervals like a hybrid of a bicycle and that of a car. For someone who rides regularly through the summer, the bicycle components should ideally be serviced at a shop once per season, if you ride year-round then you might benefit from a second servicing, once in the fall and once in the spring.

On the other hand, the electronic components generally have service intervals similar to that of a car and tend to be based on mileage, many bikes (but not all) will have an indicator when you are due to have the electronics looked at. Generally, shops will do basic things like checking for software updates, etc. when you bring it in for a tune-up.



Where should I get my e-bike serviced?

Most e-bikes have a variety of proprietary parts and systems on them so you will likely need to take it back to the shop you bought it from to get service work done. Other shops may be able to work on the bicycle parts and do basic work like flat repairs, but they likely will not have the tools needed to work on the electronics/ software of bikes that they do not sell.

When buying an e-bike it is important to ask the shop whether or not they offer service and if not where they recommend you take it. **All bikes need service, if nobody can work on it, it WILL cause you problems down the line.**

How much should I spend on an e-bike?

This is a very subjective question as everyone has a different budget and set of expectations.

Generally speaking, the sweet-spot for a hybrid e-bikes for the vast majority of people would be in the ballpark of \$2500-\$5000. In this price range you should be able to find options that have electronics from a reputable manufacturer which is important from both a durability and safety standpoint. You will also be able to find e-bikes from bigger brands with dedicated shops in this price-range which makes finding a dealer to service it significantly easier.

It should be noted that there are absolutely some great options below this price range, however, you need to be cautious when purchasing in this price range as you may be getting some off-brand components which may lack some durability, and in worst cases may pose a safety and/or fire risk if they are not manufactured correctly. If you do your research, you can absolutely find some gems under the \$2500-\$5000 range, but you might have to do some digging to find something reliable.

CONTACT US

We would love to hear from you! If you have any further questions, or would like to suggest anything be added to this guide, please reach out to our Active Transportation Coordinator,

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