

**ACTIVE TRANSPORTATION  
&  
THE EMERGING POPULARITY OF  
POWER ASSISTED BICYCLES (PAB'S),  
COMMONLY KNOWN AS E-BIKES**

**Author:** Tim Webb, Brockville Cycling Advisory Committee

**Date:** January 27, 2014

**Ref:** This .pdf file was created from a Powerpoint Presentation and personal notes that Tim Webb gave at the [Brockville Public Library](#), hosted by [Transition Brockville](#) on January 26, 2014.

**Topics**

- 1. Benefits of Active Transportation**
- 2. What is a Power Assisted Bicycle?**
- 3. E-Bike Styles, Advantages & Disadvantages**
- 4. Emerging E-Bike Styles**
- 5. E-Bikes and the Law**
- 6. Brockville's Cycling By-Laws**
- 7. Information Sources & "Shoutout's"**
- 8. General Discussion**



**1. Benefits of Active Transportation**

Municipal Governments are challenged mostly in their city cores with increased traffic, noise pollution and a shortage of parking, while trying to ensure full accessibility to services and facilities.

[Active Transportation](#) is a great way to alleviate some of these challenges, and as an added benefit to keep the community healthy. Active Transportation can include walking, cycling, e-biking, skating, skateboarding and to some degree public transport. In some areas people walk or cycle to and from the public transport stops. If it is whole or in part human powered, it is Active Transportation.

The benefits of encouraging your local community to adopt Active Transportation are plentiful, and here are several key benefits:

- ☀ **Improved Environment** – fewer vehicle trips means fewer greenhouse gas emissions, less air pollution and less noise pollution.
- ☀ **Improved Community Health** – physical activity reduces numerous chronic health problems and can contribute positively socially and mentally.
- ☀ **Increased Community Safety** – more people walking & cycling in neighborhoods improves awareness of all road users. Less vehicle congestion will decrease the risk of accidents.
- ☀ **Benefits To Store Owners** – people using active transportation are more likely to shop locally, generally within a 5km area.

- ☀ **Access For All** – Active Transportation is available to the entire community.
- ☀ **Reduced Pressure on Road Budgets** – Active Transportation requires less infrastructure and maintenance than that of a motor vehicle.



## 2. What is a Power Assisted Bicycle?



[Wikipedia](#) defines a Power Assisted Bicycle, Electric Bicycle or E-bike as a bicycle with an integrated electric motor which can be used for propulsion.

[The Ministry of Transportation Ontario](#) defines an E-bike as:

A bicycle that:

- Has a maximum weight of 120 kg (includes the weight of bike and battery);
- Has wheels with a diameter of at least 350 mm and width of at least 35 mm;
- Meets the federal definition of a power-assisted bicycle.



The Federal definition of a power assisted bicycle can be found at the [mto.gov.on.ca](http://mto.gov.on.ca) website intertwined with the MTO's definition of a power assisted bicycle. For the complete federal definition you will have to refer to the Motor Vehicle Safety Regulations under the Motor Vehicle Act, subsection 2, para 1.

### **History**

Electric Bicycles or Power Assisted Bicycles have been around since the 19th century. In fact the first electric bicycle model was patented in the United States in 1895 by [Ogden Bolton Jr.](#) This first electric bicycle used a direct current hub mounted in the rear wheel similar to today's hubs, powered by a 10 volt battery.

There is no dispute that internal combustion engines outperformed the electric motors of the time. Battery technology was in its infancy and gasoline was inexpensive.

Investment in research and development for electric bicycles was all but forgotten until the 1980's when China started producing up to 20,000 e-bikes annually. Again battery technology was not adequate and fuel prices were inexpensive, so this roll-out of e-bikes was short lived.

In the early 1990's interest in e-bikes appeared again and this time more people were paying attention because of vast improvements in battery, hub and controller technology, not to mention rising fuel prices. Between 1993 and 2004 production for e-bikes grew by an estimated 35%.

## E-Bike Classes

Electric Bicycles or Power Assisted Bicycles are classed according to when and how the power from the motor is applied.

- **Pedal-Assist** - The pedal-assist e-bike, or Pedelec (Pedel-electric) augment the efforts of the rider when they are pedaling. The maximum speed attainable depends on the hub motor power output.
- **Power On Demand** - The power on demand e-bike is activated by a throttle, usually handlebar mounted, and is the same type used on motorcycles and mopeds. The maximum speed attainable depends on the hub motor power output.
- **Power On Demand & Pedal-Assist** - There are e-bike models available like the 'Ezee Torq' e-bike that give you the option of pedal-assist or power on demand in one bike.

## Common E-Bike Components

Electric Bicycles or Power Assisted Bicycles require specific components to be able to propel the bike. These components are common to all e-bikes, but are not always interchangeable.

As I stated earlier, in the 1990's, battery, hub and controller technology had advanced to the point where e-bikes were becoming increasingly viable. Jump ahead to 2013 and you can imagine how these technologies have advanced over a further 20 years, and the increased manufacturing of these components has decreased overall costs, making them affordable, and increasing the popularity of e-bikes.

### Batteries – The Most Utilized Types

**Lead Acid (PbA)** – This type of battery has been around the longest and is the cheapest to replace. It has been largely phased out due to the lead weight, except for a predominant use in e-scooters. Lifespan = approximately 300 charges

**Nickel-Metal Hydride (NiMH)** – This type of battery is much lighter, lasts longer, higher energy density, and a safer environmental disposal record. This type of battery has for the most part replaced Nickel Cadmium (NiCad) batteries. Lifespan = approximately 500 charges

**Lithium-Ion/Polymer (Li-ion/ Li-Polymer)** – These types of batteries are the newest technology used on e-bikes. They can store about three times as much energy compared to NiMH and PbA, but are substantially more expensive. Lifespan = approximately 800 charges

### Hub Motor and Mid-drive Motor

Most e-bikes on the market today take advantage of a hub motor, which replaces either the front or rear wheel of a bicycle. Hub motors come in a variety of sizes and output ratings. For



This E-Scooter battery pack consists of 4x12V, 10A/H batteries  
Weight = Approx 18kg

example 250W and 500W hub motors have been dominant over the past several years.

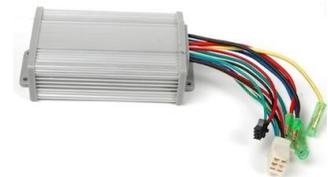
Mid-drive motors are capable of taking advantage of existing gearing on bicycles. Because the motor is centred on the bike, balance and traction is improved. With mid-drive motors changing a tire is less complicated than that of a bike with a hub motor.



E-Scooter Rear Hub Motor

## Controller

An e-bike controller is the brain of the bike, just like a controller is the brain on a solar panel setup. The controller in an e-bike is required for the battery, throttle and motor to work together. However, not just any controller will work with any e-bike setup. The controller has to be matched to the motor and batteries to prevent load and heat issues, and ultimately the failure of parts.



## Statistics Around The World

Electric Bicycles or Power Assisted Bicycles have experienced rapid growth since 1998 in Asia and European Union. In contrast North America is still lagging behind.

- **One Million E-Cyclists** – A 2012 survey completed by Fietsberaad in the Netherlands stated that there are one million e-cyclists in the Netherlands. 10% of all cycling kilometres (1.3 billion km/year) are being ridden on pedelec bikes. This survey also stated that 10% of seniors aged 60 and above now own a pedelec bike and make up 25% of the total cycled kilometres in that country.
- **China and SARS** – After the 2003 SARS outbreak, many Chinese residents switched from public transport to e-bikes creating an explosion in sales. In 2005 annual domestic sales of e-bikes reached 10 million, and grew to 30 million in 2010. Most e-bikes in North America are built in China.
- **North America & Lifestyle** – In North America cycling in any form is an inherent lifestyle choice, therefore e-bike sales have lagged behind Asia and the E.U. One statistic shows around 170,000 units sold in the United States in 2012.

Statistics for e-bikes sold are difficult to find for Canada, but you can get a very rough estimate if you account for the difference in population between the United States and Canada as our lifestyles are fairly similar. Canada is approximately 10-12% the size of the U.S., so I estimated that 17,000-18,000 e-bikes were sold in Canada in 2012.



## 3. E-Bike Styles, Advantages & Disadvantages

Each E-bike style has its own unique advantages and disadvantages, but most e-bikes as a whole suffer from the same disadvantages in regards to the battery and seasonal constraints. [Emmo Kingston E-bike Sales & Service](#), and [Kinda Electronics](#) on King St. West in Brockville are full

service dealers that can explain further in detail the distinct advantages and disadvantages for each style so you can make an informed decision on your purchase.

I was looking at some of the newer e-scooter options available and was surprised to see such options as a stereo, a cigarette lighter port, mp3 player port, remote alarm system, steering and motor locks. In contrast my e-scooter came with a motor lock option that nearly stranded me twice because it wouldn't unlock with the key. Now I use a bicycle lock.

E-Bike Style	Advantages	Disadvantages	Est. Cost
<p>Pedelec Classic/ Open Frame</p> 	<ul style="list-style-type: none"> <li>- Classic bicycle design. You can never go wrong with this style.</li> <li>- Low cost of charging, approx. 10-20 cents per charge.</li> <li>- Multi-terrain.</li> <li>- Most parts are readily available and affordable.</li> </ul>	<ul style="list-style-type: none"> <li>- Battery is susceptible to cold weather issues. You could lose up to 80% of the rated performance on very cold days.</li> <li>- Charging locations limited and charging times too long.</li> </ul>	<p>Starting at \$895</p>
<p>Pedelec Foldable</p> 	<ul style="list-style-type: none"> <li>- Designed to fit in a trunk or other confined spaces. Perfect for campsites, parks and short leisure rides.</li> </ul>	<ul style="list-style-type: none"> <li>- Limited range from battery. As the battery drains your speed will fade.</li> <li>- Bike out of balance due to rear motor hub unless counter-balanced. On front motor hub designs, the battery will normally be located on the rear storage rack for counter balance.</li> </ul>	<p>Starting at \$995</p>
<p>Pedelec Three Wheeler (E-Trike)</p> 	<ul style="list-style-type: none"> <li>- The design helps those with balance issues.</li> <li>- Ideal for those who require a larger storage area.</li> </ul>	<ul style="list-style-type: none"> <li>- Not advisable to ride in the winter because road contaminants can damage the electronics.</li> </ul>	<p>Starting at \$1,395</p>
<p>Power On Demand E-Scooter</p> 	<ul style="list-style-type: none"> <li>- Most models are designed to carry two riders.</li> <li>- Designed to carry bigger battery packs,</li> <li>- Over the past few years e-scooters have significantly improved in design and safety, and include more options.</li> </ul>		<p>Starting at \$895</p>



#### **4. Emerging E-Bike Styles**

##### **E-Bike, Motorcycle, or YikeBike?**

Canadian cities are getting their first look at this technology on its streets and paths.



Mayor Darrell Mussatto  
City of North Vancouver

*"I am having a great time riding my YikeBike as it works well in our City of North Vancouver urban environment. Being so portable, the YikeBike is easily used with our public transit system of buses, SeaBus and SkyTrain to get me around our Metro Vancouver region. It is certainly turning a lot of heads and I feel like a celebrity whenever I stop. Riding the YikeBike fits into my philosophy of being more sustainable and reducing my carbon footprint."*

In the fall of 2013 on [CBC Ottawa](#) they featured the [YikeBike](#). I'm not necessarily a fan of it, but I am intrigued by emerging personal transportation technologies, and how they continue to push the limits of existing laws.

The YikeBike according to the by-law officer in Ottawa that was interviewed stated that under the current laws the YikeBike would be considered a motorcycle. How's that possible? There are no pedals therefore it cannot be pedaled. That excludes it from being a bicycle or a moped, and the description of a Limited-Speed Motorcycle doesn't fit.

There are some that believe the e-scooter should be categorized as a Limited-Speed Motorcycle. Here's the rub; it is impossible for an e-scooter to pass the road test. It cannot maintain 50km/h. An e-scooter or any e-bike for that matter that relies on battery power cannot maintain any speed for very long due to battery fade, hills, cold climate and even wind resistance.

My personal opinion on the subject is that the [MTO](#) should create a new category, or new categories that encompass renewable energy transportation. I do not see the value in "shoehorning" the [YikeBike](#) or the e-scooter in with a motorcycle.

## Copenhagen Wheel

A Game Changer? E-Bike manufacturers should take note that the E-Wheel is here.

*Smart, responsive and elegant, the Copenhagen Wheel is a new emblem for urban mobility. It transforms ordinary bicycles quickly into hybrid e-bikes that also function as mobile sensing units. The Copenhagen Wheel allows you to capture the energy dissipated while cycling and braking and save it for when you need a bit of a boost. It also maps pollution levels, traffic congestion, and road conditions in real-time.*

*David Alyea, QBike Editor*

*Inside the Copenhagen Wheel's prominent red disc is a 350-watt electric motor and a 48 volt lithium-ion battery, which work together to generate an energy output that amounts to more than four times what the average person can put out by simply pedaling.*

*Dave, Outdoor Ottawa*



In 2009 MIT's [SENSEable City Lab](#) began working on the [Copenhagen Wheel](#) concept after the mayor of Copenhagen tasked the lab with coming up with a way to make biking more accessible to people in Urban areas.

The Copenhagen Wheel incorporates everything in the wheel so there are no cables and wires to fiddle with. The wheel can be controlled by a smartphone app that can give you a myriad of information, but if you don't have a smartphone the wheel will still work in a default mode.

The cost is around \$700 and the company is now taking pre-orders through their [Superpedestrian.com](#) website.



## **5. E-Bikes and the Law**

In Ontario activities on our roadways are governed by the [Highway Traffic Act](#) (HTA). This includes not only motor vehicles, but pedestrian and cyclist usage as well. Within the HTA legalese "highway" refers to any road and not only the 400 Series, Secondary, and King's highways.

E-bikes must follow the same rules of the road that apply to cyclists within the HTA, and are not classified as a motor vehicle under that act. Furthermore E-bikes are restricted to 32 km/h and bicycles are not restricted by speed under the [HTA](#).

In contrast, under the [Criminal Code of Canada](#) E-bikes are defined as a motor vehicle.

If you are caught over the legal limit .08 alcohol on an e-bike you are subject to the same penalties under the Criminal Code of Canada as you would be in a motor vehicle. However, under the [HTA](#) penalties for impaired driving would not apply.

In Ontario the [MTO](#) ran a pilot project from October 2006 until October 2009 evaluating the safe integration of e-bikes in with other vehicles and pedestrians. The idea of the project was to treat e-bikes exactly like bicycles with two exceptions. Riders must be at least 16 years of age, and all riders must wear an approved helmet.

This pilot project and safety review concluded that e-bikes could continue to operate on Ontario's roads. However, there were some concerns primarily related to some of the larger and heavier e-bikes, which resulted in additional mandatory safety requirements.

- The maximum weight of an e-bike is 120 kilograms;
- The maximum braking distance is nine (9) metres;
- No modifications are allowed to the motor that allows power-assist beyond 32 km/h;
- The minimum wheel width is 35mm and a minimum wheel diameter of 350mm;
- Proper insulation is required for electrical systems and batteries;
- Riders must wear an approved bicycle or motorcycle helmets, regardless of age.

**Note** – All the laws are listed on the MTO website, and I encourage you to review them.

Through the [MTO](#) pilot project recommendations, coupled with subsection 2(1) of the Motor Vehicle Safety Regulations under the [Motor Vehicle Safety Act](#), we now have the following laws governing e-bikes:

- Operators must be 16 years of age or older;
- All operators must wear an approved bicycle or motorcycle helmet at all times;
- No person who is the owner or is in possession or control of an e-bike shall permit a person who is under the age of 16 years to ride on, drive or operate the e-bike on a highway;
- An e-bike must not be ridden on, driven or operated unless it is good working order;
- Similar to bicycles and mopeds, power-assisted bicycles are prohibited from use on certain provincial controlled-access highways;
- Any municipal by-law prohibiting bicycles from highways under their jurisdiction also apply to e-bikes. Municipalities may also pass by-laws specific to e-bikes that prohibit them from municipal roads, sidewalks, bike paths, bike trails, and bike lanes under their jurisdiction;
- Have a maximum unladen weight of 120 kg (includes the weight of vehicle and battery);
- Must be equipped with at least two independent braking systems that applies force to each wheel and is capable of bringing the e-bike, while being operated at a speed of 30 km/h, to a full stop within 9 metres from the point at which the brakes were applied;
- Must have wheels with a minimum diameter and width of 350 mm and 35 mm respectively;
- Must have all electrical terminals completely insulated or covered and, along with the battery and motor, must be securely fastened to the bicycle to prevent them from moving while the bicycle is in motion.
- No modifications to the motor of an e-bike to permit it to exceed the federal requirements for motor output or speed for an e-bike (500W and a speed greater than 32 km/h) are allowed.

- **H**as steering handlebars and is equipped with pedals;
- **I**s designed to travel on not more than three wheels;
- **H**as an electric motor that has a power output rating of 500W or less.  
Note: the motor is electric, and is incapable of propelling the cycle at speed of 32 km/h or greater on level ground, without pedaling;
- **B**ears a permanently affixed label by the manufacturer stating in both official languages that the vehicle conforms to the federal definition of a power-assisted bicycle.

Because e-bike's are still relatively new to cities in North America in the numbers we are now seeing, there is somewhat a lack of education and a considerable amount of frustration from driver's and traditional cyclists who now have to adapt to these more than just occasional abominations' that travel too slow for driver's, but too fast for pedestrians and traditional cyclists, causing a number of issues in dedicated bike lanes, trails, and green spaces in mostly major cities.

The Share The Road Program ([sharetheroad.ca](http://sharetheroad.ca)) attempts to address these issues through education and awareness. This is where the old saying comes in handy – “Can't we all just get along?”

Let's explore city by-laws further.



## **6. Brockville's Cycling By-Laws**

Local municipal bylaws are allowed to place further restrictions on traffic, but they may not contradict the Ontario laws.

Brockville's Cycling By-laws are designed to help make our roads and highways safe for cyclists, pedestrians and motorists.

### [By-law Ammendment#083-2004](#)

*1. THAT the following be inserted into the traffic by-law 21-93:*

*8.3 - No person shall ride a skateboard, bicycle or roller blades on sidewalks located on:*

*a) King Street between Clarissa Street and Bethune Street*

*b) Blockhouse Island*

*c) Court House Avenue at the cenotaph*

Currently, Brockville has only one by-law related to bicycling. The Brockville Cycling Advisory Committee plans to work closely with the municipal government and local stakeholders in the near future to address this shortfall.

Across the country cycling by-laws can be found enacted more so in larger metropolitan areas like Toronto or Vancouver, than that of smaller cities and towns. The reason for this is fairly obvious. More people utilize active transportation in larger metropolitan areas; therefore roads, bike lanes, trails and open spaces need municipal regulation and control to make these areas safe and orderly for all users alike. For example a simple by-law could be “only muscular power in bike lanes”. After a few exhaustive searches I found very little information online related to municipal by-laws across Ontario and Canada in regards to e-bikes. Most, but not all municipalities instead have chosen to adopt the standard provincial laws and have done a very

nice job at “copy & paste”. When it comes to Municipal by-laws, a “copy & paste” approach may work for some municipalities, but if you were to take [Ottawa’s](#) or [Toronto’s bicycle by-laws](#) and use a “copy & paste” approach to apply them to Brockville, you may find these by-laws overreaching and somewhat restrictive considering we only have a small city of 20 odd thousand residents compared to Toronto with almost 3 million, or Ottawa with almost one million residents.

It is important to note that the [National Capital Commission](#) in Ottawa developed a new set of rules for electric bikes on the NCC’s 236 kilometres of multi-use recreational pathways within the Capital Pathway Network. These new rules were developed following consultations with the public, the City of Ottawa and Ville de Gatineau, local interest groups, public sector employees from other Canadian cities (Toronto, Vancouver and Montreal) as well as specialized cycling agencies.

Dan Chenier, General Manager of Parks, Recreation and Cultural Services Ottawa was quoted as saying: “The city has harmonized its approach with the National Capital Commission and allows the use of power-assisted bicycles that are physically similar to conventional bicycles. Scooters are considered motorized vehicles and therefore are not permitted on City of Ottawa’s pathways.”

### **City of Toronto E-bike Bylaws**

#### **Bike Lanes**

According to City of [Toronto bike lane bylaws](#), bicycles must be propelled by muscular power. If a bicycle is being propelled by the power of a motor, then it is not considered a bicycle, it is considered a motor vehicle, and bicycle lanes are designated for the use of bicycles only. A electric bicycle user may have their motor turned on while they are in a regular traffic lane, but if they wish to merge into a bicycle lane, then they must turn their motor off, and propel themselves by pedaling while in the bicycle lane.

#### **Post and Ring Bicycle stands**

E-bikes, which are lighter than motorcycles and could be stolen if left on the street may use post and ring bike parking stands. Post and ring stands are intended for short term parking.

#### **Toronto Ferries**

Only electric bicycles with a wheel diameter of 26" or larger are allowed on the ferries to the Toronto Islands.

#### **Park Paths**

In City of Toronto Parks electric bicycles may be ridden on parks roads, but motors should not be used on parks paths and trails. This means that on paths such as the Waterfront - Martin Goodman Trail, Don Valley Trail, or Humber Trail, a Police Officer or bylaw officer may ticket an electric bicycle rider \$305.00 for engaging their motor. An electric bicycle user may use their motor while traveling on roadways to arrive to a City Park, but once they enter the park, they must turn off their motor, and propel themselves by pedaling while in the City Park.

### **By-Law Enforcement**

As smaller towns and cities adopt or add restrictions to their existing cycling by-laws, those cities and towns may have to hire an additional by-law officer or an additional police officer, which would of course be at the taxpayer’s expense.



## **7. Information Sources & “Shoutout’s”**

- <http://www.emmokingston.ca/>
- <http://www.kindaelectronics.com/>
- <http://www.evelo.com/evelo-difference/advantages-mid-drive-motor-vs-hub-motor/>
- [http://www.scooterunderground.ca/knowledge/Electric\\_Bike\\_Electric\\_Scooter\\_Batteries.htm](http://www.scooterunderground.ca/knowledge/Electric_Bike_Electric_Scooter_Batteries.htm)
- <http://endless-sphere.com/forums/index.php>
- <http://www.ebikes.ca>
- <http://www.mto.gov.on.ca/english/dandv/vehicle/emerging/index.shtml#power>
- <http://www.mto.gov.on.ca/english/pubs/cycling-guide/pdfs/cycling-guide.pdf>
- <http://www.fietsberaad.nl/index.cfm?lang=en&section=nieuws&mode=newsArticle&repository=One+million+e-cyclists>
- <http://elmo03057.hubpages.com/hub/The-History-of-the-Electric-Bicycle>
- Advantages of Electric Motorcycles and Scooters  
<http://www.brighthub.com/environment/renewable-energy/articles/20621.aspx>
- [http://en.wikipedia.org/wiki/Electric\\_bicycle](http://en.wikipedia.org/wiki/Electric_bicycle)
- <http://www.navigantresearch.com/blog>
- Electrification of Road Transport – An Analysis of the Economic Performance of Electric Two Wheelers – 2013 Thesis, P.W.K. Dekker, Utrecht University  
<http://igitur-archive.library.uu.nl/student-theses/2013-0522-200624/Thesis%20P.W.K.%20Dekker%2012%20May%202013.pdf>
- Public Health Agency of Canada – What is Active Transportation  
<http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/at-ta-eng.php>
- <http://activetransportation-canada.blogspot.com/>
- <http://www.beactive.wa.gov.au/assets/files/Fact%20sheets/What%20is%20Active%20Transport.pdf>
- <http://energyblog.wordpress.com/thread-motor-assisted-bicycle-legal/>
- [http://www.ccmta.ca/images/publications/pdf//power\\_assisted\\_cycles.pdf](http://www.ccmta.ca/images/publications/pdf//power_assisted_cycles.pdf)
- <http://ktownebiker.freeforums.org/>
- <http://www.recorder.ca/2013/08/02/power-or-pedal>
- <http://www.thewhig.com/2012/07/29/e-bikes-gaining-popularity--and-attention-of-police>
- <http://ottawa.ca/en/residents/transportation-and-parking/cycling/cycling-and-law>

### **Special Thanks To:**

- [Emmo Kingston E-Bikes & E-Scooter Sales & Service](#) – provided images & literature
- [Transition Brockville](#) – Sponsored the Presentation
- [Brockville Public Library](#) – provided facility and technology to view presentation
- Alan Medcalf – Brockville Cycling Advisory Committee Chairman – provided guidance & support for which this presentation would not be possible.

### **About the Author:**

Tim Webb is a new member of the Brockville Cycling Advisory Committee. Tim's background in cycling is mostly limited to E-Bikes, more specifically E-Scooters, and has been riding an E-Scooter in Brockville for the past three years as his primary mode of transportation. You can see Tim "Scootin" (as his fake license plate reads) about Brockville in all four seasons with or without his tow-along utility trailer.

*"I may be slow, but I can pass a gas station."*

One day I was travelling west on Parkedale Avenue and pulled up to a red light at Windsor Drive. A rumbling Harley Davidson motorcycle pulled up beside me at the stoplight, started revving his engine and when the light turned green he took off like a "bat out of hell". Less than thirty seconds later I passed the Esso station where that same Harley was filling his gas tank. I laughed, beeped my horn and rode on. I thought to myself that would have made for a pretty good green technology commercial.



### **8. General Discussion**

**Q -** How do you feel that Brockville can improve on incorporating Active Transportation into it's infrastructure? For example creating a dedicated connected network of trails, paths and bike lanes with proper signage comes to mind.

**Q -** Do you feel that any Brockville by-law regulating bike lanes, paths and trails would be beneficial to all riders, or a waste of time and money?

**Q -** Do you feel a "copy & paste" solution from other municipalities in regards to bicycle and e-bike by-laws is appropriate? Would this approach work in Brockville?

**Q -** Now that you now have a better understanding of what e-bikes are, how they work, along with their advantages and disadvantages, would you in the future consider purchasing an e-bike to supplement or replace other modes of transportation?

**Q -** Share your personal e-bike story or incident.

Thank you for your participation