

Bruce Freeman Rail Trail Advisory Committee

e-bike White Paper

December 1, 2021

Submitted by Deborah L Adleman

Outline

Executive Summary: Purpose of this document

What is an e-Bike?

History of e-Bike

Regulatory/classification tiers/legislation

- Classification tiers
- New England e-bike legislation
- e-bike and Rail Trail
- Draft Massachusetts legislation

e-bike challenges

e-bike fears

Questions for the BFRTAC to Consider Discussing

Rough straw model list of steps in the e-bike BFRTAC conversation

Appendix

Frequently Asked Questions

Resources

Executive Summary: Purpose of this document

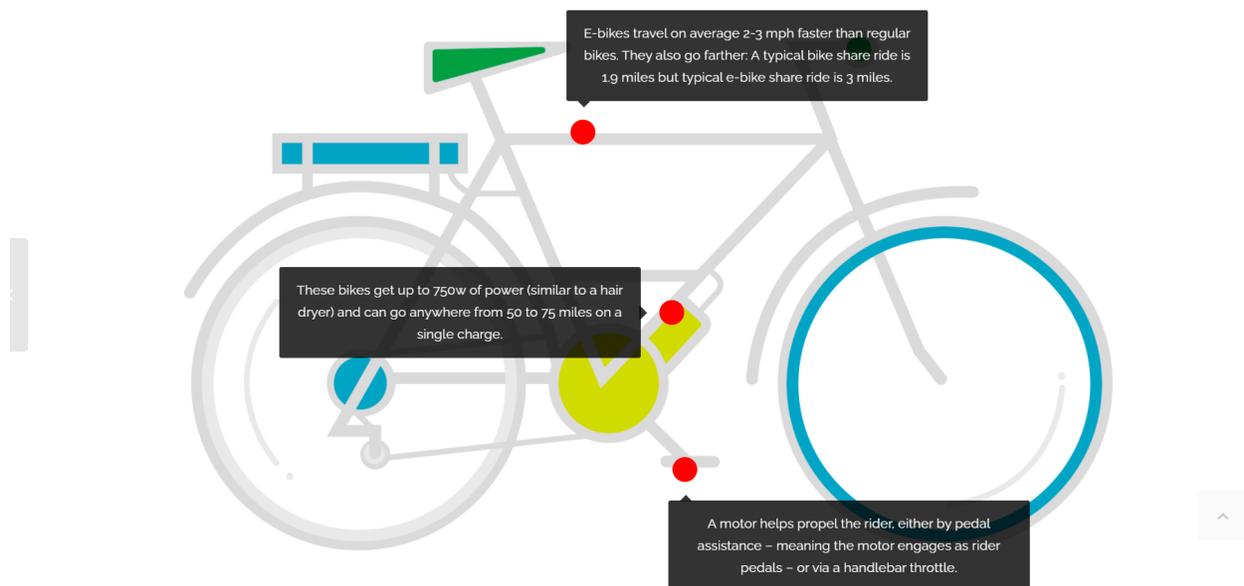
Given the growth in use of e-bikes throughout the United States and in particular, the likelihood that e-bikes will increasingly be used on rail trails, the Bruce Freeman Rail Trail Advisory Committee (BFRTAC) chairpersons have decided to discuss e-bike, its potential impacts on the Bruce Freeman Rail Trail (BFRT) and what if any further discussions or actions could be taken. The purpose of this document is to provide the background to facilitate this initial discussion of the BFRTAC.

What is an e-bike?

An e-bike is power assisted and uses pedals propelling the rider. An e-bike gets its power (the electric in e) from an increasingly smaller battery. Today you can, if you look at the e-bike, see the battery pack.

E-bikes are most frequently “pedal-assist” or “muscle-assist,” meaning the rider must be pedaling for the electric motor to engage. E-bikes may also come equipped with a throttle that allows the bike to be propelled without pedaling.

The bicycle’s low-speed electric motor provides a boost of power to climb hills, extend the range of trips where a bicycle can be used, allow current bicycle users to bike more often and farther, provide a new recreation option for people who want to bike and in general, extend the range of any ride.



Source: <https://bikesmakelifebetter.com/infographic-the-rise-of-e-bikes/>

History of e-bikes

e-bike have been around, in one form or another for over 50 years. What has changed is the size of the battery, length of the battery life, small weight of the battery and increasing inability to distinguish an e-bike from a conventional bike unless one looks closely for the battery pack.

In the same way that cloud storage and artificial intelligence were made possible because it was cheaper to store data and computer speeds increased dramatically, so too, e-bikes of today have been made possible because the modern battery is cheaper, can be so small and last longer. Similar to the Citi-bike, ride share services may begin cropping up for e-bike.

Increasing popularity of e-bikes

Between 2020 and 2023, as many as 130 million e-bikes are expected to be sold¹

e-bike sales, as of 2018, were at least 10 percent of total bike sales²

the typical e-bike battery can last between 50 and 100 km (or 30-60 miles)³

Non- US markets are even stronger than US e-bike markets

While the cost of an e-bike, similar to a traditional bike can have a very wide range (between \$600 and \$8000), mainstream e-bikes cost is between \$1500 and \$4000 with the majority below \$4000.⁴

e-bike share systems are increasing⁵ but there have been issues with battery reliability⁶

¹ www.ebicycles.com

² IBID

³ Easyebiking.com

⁴ E-bikeshq.com

⁵ NY Times, 'Farther, Faster and No Sweat: Bike-Sharing and the E-Bike Boom', October 12, 2021

⁶ Nabsa.net

Regulatory/Legislation/classification tiers

US Federal

Consumer Product Safety Commission (HB727).

At the federal level, an e-bike is defined under the Consumer Product Safety Commission (HB727). This definition does not apply to 'how' the e-bike is used but rather 'what' the e-bike includes⁷.

HB727 defines a low-speed electric bicycle as

- 2 or 3 wheeled vehicle
- Fully operable pedals
- Electric motor less than 750 watts (1horse power)
- Maximum speed on a paved, level surface is less than 20mph.
- Can be powered by the motor alone or motor and human power (a "pedal-assist" e-bike).⁸

If you see someone on what looks like a bike, but there are no pedals, that is not an e-bike.

But if you see someone on an e-bike but they are just not pedaling, this can be an e-bike.

Significantly, federal law only specifies the maximum speed that the e-bike can travel under motor power alone. It does not provide a maximum speed when the bicycle is being propelled by a combination of human and motor power, which is how e-bikes are predominantly ridden. The Consumer Product Safety Commission has clarified that the federal law does allow e-bikes to travel faster than 20 mph when using a combination of human and motor power.

The National Park Service (NPS) issued Secretary of the Interior Order 3376

The National Park Service (NPS) issued Secretary of the Interior Order 3376 'Increasing Recreational Opportunities through the use of Electric Bikes'⁹ on August 29, 2019 and then on August 30, 2019 issued Policy Memorandum 19-01, Electric bicycles (as required by the Order). The highlights of the Memorandum include:

- Distinguishes e-bikes from motorized vehicles (e.g. cars) found in 36CFR 1.4
- Definition to include 2 or 3 wheeled cycle with pedals and motor not to exceed 750 watts which propels the rider
- Differs from the CPSA by not limiting the definition by weight or by solely being powered by the battery at 20MPH

⁷ <https://www.congress.gov/bill/107th-congress/house-bill/727/text>

⁸ <https://www.railstotrails.org/build-trails/trail-building-toolbox/management-and-maintenance/e-bikes/>

⁹ The NPS' regulations governing bicycles and ebicycles broadly can be found in the federal register at 36 CFR including 4.30 and 1.4.

- Permits e-bike limitation (including types of e-bike(see below classification) or closure of some roads, trails, or portion for safety or health reasons
- Permits e-bike on some roads, trails, or portions that are already open to traditional bicycles
- Adopted 3 classification tiers increasingly adopted by US states

Classification Tiers (increasingly used by US States)

Various organizations and now many US states have begun to use this same classification that the NPS used. This 3 tier system makes it easier to distinguish them from other motorized vehicles which are also increasing in use such as scooters or motorized longboards. Additionally, these '3 tiers' of e-bikes are focused on the power source and maximum assisted speed of the bicycle.

Class I e-bikes are those in which the motor provides a boost only when a rider is pedaling. The boost cuts out at 20 miles per hour (mph), and the rider must rely on their own muscle power to go any faster than that.

Class II e-bikes are those in which the throttle can be switched to provide a boost up to a maximum assisted speed of 20 mph, without any pedaling required. The boost cuts out at 20 mph, and the rider must rely on their own muscle power to go any faster than that.

Class III e-bikes are pedal-assist like Class I's, except they have a maximum assisted speed of 28 mph. They are also equipped with a speedometer.

State Legislative Scan

While the sale of an e-bike is regulated as noted earlier by the CPSC, the operation of the e-bike on streets or bikeways or trails (other than as noted regarding the NPS) are controlled by the US States and their legislatures. Some states follow the exact 3 tier system noted above and some do not. Some states regulate 'how' e-bikes should be used and some do not. Notably, some states still do not distinguish an e-bike from a 'motorized vehicle' like an automobile that requires licensure and registration. The key issues the states have been grappling with include:

- Re-classification of e-bike distinct from other motorized vehicles
- Creating the 3 tier system focusing on speed and motorized capabilities

At least 44 states have a separate definition now for e-bike. States in New England include Maine, Connecticut, New Hampshire, Rhode Island, New York, New Jersey. Massachusetts does not currently have this e-bike definition.

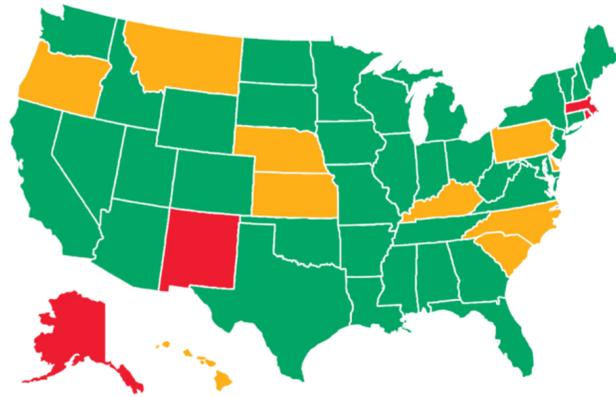
New England States e-Bike Legislation

- Connecticut – e-bikeclass1 or 2 on rail trail and full law
- New Hampshire- same as Connecticut

- Vermont- same as Connecticut and New Hampshire except Vermont allows all 3 classes on the rail trail
- Rhode Island- unclear- no specific law; e-bike treated as motorized vehicle

ELECTRIC BICYCLE RULES FOR THE ROAD

MODEL LEGISLATION	<ul style="list-style-type: none"> States that have enacted PeopleForBikes' model law, which defines and regulates three classes of electric bicycles within states' motor vehicle codes, gives riders similar rights and duties to that of traditional bicycle riders.
ACCEPTABLE	<ul style="list-style-type: none"> Regulated as a bicycle Passengers allowed No age minimum No licensing or registration required Can use existing bike infrastructure
PROBLEMATIC	<ul style="list-style-type: none"> Regulated as a moped or motor vehicle Confusing equipment + use requirements Confusing licensing + registration requirements Confusing access to bike infrastructure



Source: <https://www.peopleforbikes.org/topics/electric-bikes>

e-bike and rail trail

Of the 43 states and D.C. that define e-bikes, some state laws, such as in Arizona, Minnesota, Utah and Washington, specifically allow e-bike operation on facilities such as bicycle paths or greenways, with the caveat that many carve out exceptions for localities to enact stricter operation regulations on such bike and pedestrian facilities. In Delaware, Iowa and Nebraska, electric bicycles are defined within the existing definition of a bicycle, therefore there is not a distinction when it comes to operation on trails. Vermont specifies that motor-assisted bicycles are governed as bicycles and have the same rights and duties applicable to bicyclists. Hawaii's law does not include restrictions on where e-bikes may operate.

Cape Cod Rail Trail

Although Massachusetts does not define e-bike, e-bike use is specifically permitted on the Cape Cod Rail Trail as long as they are pedal assisted¹⁰.

Pilot programs¹¹

[Park City, Utah](#), performed their pilot in 2015, limiting Class I and II e-bikes to paved trails wider than eight feet within city limits. The City added signage at trailheads to indicate where e-bikes were allowed or prohibited. The

¹⁰ <https://www.capecod.com/newscenter/e-bikes-now-allowed-along-cape-cod-national-seashore/>

¹¹ <https://www.railstotrails.org/build-trails/trail-building-toolbox/management-and-maintenance/e-bikes/>

pilot included a data-collection component, with the City performing trail counts, field observations, intercept surveys and speed counts, as well as reviewing police reports; and an outreach-and-education component using traditional media, a dedicated website and an online survey. Today, the City allows e-bikes on all paved multiuse trails, as well as on soft-surface trails wider than five feet with a 15-mph speed limit for all users. A [map](#) of trails where e-bikes are permitted is available on the city website. [Source: Rails to Trails](#)

Other communities enact ordinances

Some cities have allowed e-bikes on their multiuse trails without first running a pilot program. **Boise, Idaho**, revised its [bicycle laws](#) in 2017 to allow Class I and II e-bikes to be operated on streets, bike lanes, sidewalks and on the [Boise River Greenbelt](#). For the mountain biking trails in the Boise Foothills, only persons with mobility impairments are allowed to use e-bikes.

Earlier that same year, the City of **Tempe, Arizona**, adopted an [ordinance](#) which, among other things, permitted use of e-bikes on multiuse trails at a top speed of 20 mph. E-bikes must yield to pedestrians and equestrians and slow to 5 mph when passing. Riders must also be 16 or older, and riders between 16-18 have to wear helmets.

Source: [Rails to Trails Conservancy](#)

Draft Massachusetts Legislation

There is draft legislation in Massachusetts¹². Highlights include:

- Define e-bike (definitions of motorized bicycle or motor vehicle would exclude that of an electric bicycle)
- Utilize the 3 tier classification of other including nearby states.
- Permit localities to further restrict e-Bike class 1 or class 2 on a bike path or shared use path
- Prohibits class 3 from being used on a rail trail or bike path, shared use path unless permitted by the locality
- Class 3 e-bikes must have a speedometer
- Requires use of a label which includes the classification number, top speed and wattage
- Prohibits use of class 3 by persons under 16 unless they are riding as a passenger on an e-bike designated to accommodate passengers
- Class 3 riders must wear an approved helmet

Typically, where e-bikes *have* been allowed off-road on multiuse trails, they have been Class I's and Class II's, and are subject to the same rules and regulations that govern other cyclists.

Source: [Rails to Trails Conservancy](#)

¹² Proposed MA legislation, H.3457 Representative Dylan Fernandes Representative Steven Owens, S.2309 Senator Sal DiDomenico

Who rides e-bikes and why?

- Today 40 years and older, but the younger demographic is increasing
- Today middle class individuals but as the price of e-bikes decline and accessibility increases, this demographic will shift
- e-bikes make trips easier, quicker and less expensive (like citi-bikes)
- e-bikes are better for the environment
- e-bikes allow individuals with unique abilities to ride a bike where without power assist they could not
- e-bikes help families with ordinary daily activities when they otherwise would need a car such as taking children to school or running errands

E-bike challenges

- Lack of consistent federal or state legislation
- Some states continue to lump e-bike with motorized vehicles like cars creating confusion
- Lack of clarity on rules of the road
- Lack of awareness by the public leading to unfounded fears
- New technology creating potential risks for riders and pedestrians
- The use of e-bike is only expanding¹³.

e-Bike fears

- How can someone identify an e-bike?
- The e-bike is so quiet and this can startle people on the railtrail or worse
- Will e-bike add too much traffic to the railtrail?
- How will we know that the e-bike has not been altered to go too fast?
- How can we enforce proper speeds?
- Won't e-bike users go much faster than all other users of the rail trail?
- How do we address the growing popularity of e-bike without discriminating?
- What about overcrowding?

[User conflicts](#) are an unfortunate but expected reality of multiuse trails, where a variety of user types share a fairly constrained space. As with other types of user conflicts, maintaining safety on a trail is often better accomplished by enforcing proper behavior rather than strictly regulating the equipment used. If e-bikes are allowed on a trail, they should conform to the existing rules of the trail and [norms of trail etiquette](#) including: 1. Maintain safe speeds. 2. Heed all posted speed limits. 3. Keep right, pass left and call out as you do. 4. Yield to pedestrians, equestrian users and other slower trail users. Source: [Rail to Trail Conservancy](#)

Questions for the BFRTAC to Consider Discussing

- How will this impact our existing signage?
- Who is supposed to pay for all this?

¹³ <https://bikesmakelifebetter.com/infographic-the-rise-of-e-bikes>

- What should the role of the friends of the BFRT be¹⁴?
- What should the role of the BFRTAC be?
 - What educational or communication efforts look like?
 - What would impact be on existing signage?
 - What other public campaigns would be appropriate?
- Who would be responsible for enforcing proper e-bike use on a rail trail? What would our role be in suggesting areas for enforcement?
- How can the BFRTAC and Friends of BFRT learn from what other rail trail systems in the United States done to address e-Bike?
- What groups could we engage with to get guidance and learn more?
 - What role could the central transportation planning staff play if any to perform a feasibility study?
 - How could the Metropolitan Area Planning Council help us;they advocate for Nashoba regional greenway (David Loutzenheiser point)
 - How can the Massachusetts Bicycle Coalition provide assistance?
 - What role could the Department of conservation and recreation play

Rough straw model list of steps in the e-bike BFRTAC conversation

First BFRTAC agenda meeting

- Discuss white paper
- Marcia share her perspective
- Discuss anecdotes, data
- Possible guest speaker (or hold to 2nd meeting when members are sufficiently educated)

Second BFRTAC agenda meeting

- Add in local groups like police and other groups mentioned earlier

Third BFRTAC agenda meeting

- Strong community focus (Spring/Summer, 2022)

¹⁴ <https://brucefreemanrailtrail.org/rail-trail-resources/rail-trail-studies/>

Appendix

Various Frequently Asked Questions (FAQ) regarding the proposed Massachusetts draft e-bike legislation¹⁵

Why is this legislation needed?

In Massachusetts, electric bicycles lack a specific vehicle classification, causing them to fall within terms primarily aimed at combustion engine vehicles such as mopeds or scooters. These classifications that were never intended to apply e-bikes. This legal scheme creates significant confusion for consumers and retailers, and hinders the electric bicycle market. In order to clarify state law and properly regulate electric bicycles like traditional bicycles, it is critical to understand the existing legal rules that govern electric bicycles.

What other states use the classification system in this bill?

Michigan, Illinois, Connecticut, Arizona, Washington, Tennessee, Arkansas, Colorado, Utah, and California.

Why is the top speed for Class 3 e-bikes 28 MPH?

These rules would provide uniform product standards between the US and European markets, where bikes with a top speed of 45 kph (approximately 28mph) are classified as a “speed pedelec.”

I have read the federal definition of an e-bike and it says that the top speed is 20MPH. How are class 3 e-bikes legal given the federal definition?

The 20 MPH threshold applies when the e-bike is being operated “solely” under motor power. However, e-bikes are most commonly ridden under a combination of human and motor power. The federal definition does not provide a top speed for when an e-bike is being operated under combined human and motor power. The class 3 definition clarifies this ambiguity by specifying the maximum assisted speed for e-bikes at 28MPH.

Can e-bikes be safely operated on bike paths?

Yes. Researchers who have compared riders of e-bikes and regular bikes at the University of Tennessee observed that e-bikes riders exhibit similar safety behavior as riders of traditional bicycles. Perhaps most importantly, e-bike riders traveled at similar speeds to riders of human powered bicycles. They rode slightly faster when riding on the road (+1.8 mph), but actually slower than regular bikes riders when on bicycle paths (-1 mph).

Why not regulate e-bikes at the federal level?

E-bikes have been regulated federally since 2002. However, as with other consumer products, the federal regulations are limited to product safety. They do not specify where e-bikes may be ridden or what rules of the road govern their use. While the federal government can intervene in these matters in very rare situations, the rules of the road are generally a matter of state law. Other emerging

¹⁵ <https://www.massbike.org/e-bikesfaq>

technologies have followed the same path of creating new state traffic laws to address the use of these devices on our streets. This includes segways, autocycles, and commercial quadricycles.

How can anyone tell what an e-bike is?

E-bikes are becoming more and more difficult to distinguish from regular bicycles. The labeling requirement in the model bill is a proactive measure on behalf of the industry to ensure that law enforcement or land managers can easily tell that a bicycle is in fact an e-bike, and quickly assess which type of e-bike it is.

Can people tamper with e-bikes?

Like other mechanized or motorized devices, it is possible that a user could tamper with an e-bike. We have inserted a tampering provision in the model bill that will place the onus on the owner to have a properly labeled bike if that were to occur. If someone was to tamper with an e-bike and create a machine that can travel faster than any of the specified classifications of e-bikes, they would presumably be operating an unlicensed and unregistered vehicle, and would be subject to any applicable penalties.

Does the bill regulate e-bikes off-road?

No, it only amends the traffic laws located in the revised vehicle code. The bill will provide rules for the regulation of e-bikes on our streets and on bicycle paths. The bill does not address the use of e-bike on trails.

Who is the typical purchaser of an e-bike?

All types of people purchase and use e-bikes, especially older, baby-boomer purchasers, parents who want to carry children as passengers and cargo, and people who prefer the purchase of an e-bike over a car.

How many e-bikes are sold each year in the U.S.?

Approximately 260,000 e-bikes are sold annually in the U.S. However, they are the fastest growing segment of the bicycle sales, with approximately 75% year-over-year growth.

How much do e-bikes cost?

Entry-level e-bikes are about \$1,500.

Why distinguish between class 1 and class 2 e-bikes in the bill if the rules are the same?

The distinction between these two types of e-bikes provides for greater local flexibility. Some municipalities have demonstrated an interest in prohibiting throttle-powered e-bikes from certain types of infrastructure, and this bill provides the flexibility to take those measures if they are desired on a local level.

Does the rider have to be pedaling for the e-bike's motor to be engaged?

It depends on the type of e-bike. For Class 1 and Class 3 e-bikes, the rider must be pedaling for the motor to be engaged. For Class 2 e-bikes, the motor can propel the e-bike without the rider pedaling.

How do e-bike classes in Massachusetts define what an

Are there any age restrictions to riding an electric bike in Massachusetts?

You need to be 16 or older to ride an e-bike in Massachusetts.

What are the laws around helmets in Massachusetts?

Any person operating and motorized devices, including electric bikes, must be wearing a helmet.

What are the rules for riding on the road in Massachusetts?

Electric bikes may ride on all public ways except express state highways where signs specifically prohibiting bicycles have been posted. Electric bikes may be operated in bike lanes but are excluded from off-street recreational bicycle paths.

Resources

[Draft Massachusetts e-bike legislation](#)

[MassBike and eBike details](#)

[EBikeMass FactSheet](#)

[Ebike FAQ](#)

[Peopleforbikes](#)

[State by State eBike legal status site](#)

[Connecticut has an eBike regulation](#)

[Links to national laws, model legislation and eBike overviews](#)

[National Park Service General provisions electric Bikes](#)

[National Conference of State Legislatures, an EBike Legislative Primer](#)

[Bikesmakelifebetter.com](#)

[eBike and Rails toTrails Conservancy](#)

[Bruce Freeman Rail Trail and studies](#)

[eBikes allowed in the National Seashore 2019](#)