

Basic Acceleration Tests, Classification Issues, Definitions, and some other Considerations in Micromobility Vehicle Accident Reconstruction.

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Micromobility Vehicles such as Electronic Limited use Motorcycles/Mopeds, E-Bikes, and electronic scooters are becoming more and more popular and it follows that there are now many more accidents involving these types of vehicles, many occurring at speeds less than 20mph. Although many of the machines, especially the limited use motorcycles, are street legal and can be registered, many are not. Their range, ease of charging, lack of needing fuel, simple mechanical construction as compared to gasoline driven vehicles, ability to carry a passenger, ease of parking, ease of storage, ability to navigate in tight spaces, ability to register street legal, and relatively low price as compared to other legal forms of transportation are some of the reasons these vehicles are so popular. The National Library of Medicine([Electric Scooter-Related Injuries: A New Epidemic in Orthopedics - PMC \(nih.gov\)](https://pubmed.ncbi.nlm.nih.gov/32411111/)) has conducted research into electric scooter accidents. They have concluded that Injuries caused by electric scooters are an emerging phenomenon, despite existing regulations. There are many other studies that analyze the injuries sustained in these accidents. Most injuries in such accidents are severe and preventable. Although many of the injuries are not life threatening, when these vehicles collide with cars and trucks, the injuries are often life-threatening or fatal. Equipment(especially headlights) are often factors in these types of accidents. In many situations, riders tend to treat these vehicles as recreational toys and do not think about the dangers involved with riding them. Visibility, braking, riding location, and lack of safety in many urban areas are potential

problems with these vehicles since they are often driven in between stopped and slow moving traffic, sometimes by children. A common accident is when one of these vehicles is approaching a red traffic signal passing in between rows of other vehicles stopped for the traffic signal. Generally speaking, many of these vehicles are not street legal, do not have headlights, and are not something motorists are expecting to see in many situations. Much of the Harry Hurt conspicuity issues come into play with regard to visual cross section and contrast. It is also noted that there are many start-up companies manufacturing these Limited Electric Motorcycles and micromobility vehicles that are not certified and have no VIN#, therefore being illegal to drive on the road. Some of these vehicles are homemade and do not even come with an owners manual.

Purpose of this Paper

The main purpose of this paper is to share some Vericom and micromobility vehicle information we have accumulated in testing a Fly-7 Electronic Limited Use Motorcycle and researching a little into the world of these small vehicles. Although so many of these accidents are at low speed, there is still the need to utilize effective drag factors as well as acceleration factors in working the kinematics of a case. We were not able to find much information on these parameters with regard to these vehicles, as most references just indicate they are treated like motorcycles. However, they are different and it is a good idea to have a frame of reference derived from actual skid and acceleration tests of these vehicles to avoid confusion. It is also worthy to note that the wheels are much smaller than that of a real motorcycle which makes braking with the front brake more sensitive. The tables listed below are raw data and I have not done any statistical analysis of the results.

There is a plethora of other information regarding these vehicles that will only be touched upon here. In dealing with some of these accidents, we have found the definitions and classifications are very confusing. Even simply researching between the Laws of the State of New York and the Laws of the City of New York, there is a lack of organization relative to classifications, definitions, and laws. As you spread out the conversation about these vehicles across the country, abroad, across various governmental agencies and user groups, the confusion in terminology increases appreciably. This article is not going to address all of that but will highlight the New York parameters. By way of this paper, I am just going to get briefly into the confusing legal and classification issues in New York to expose the fact that a reconstructionist has to define what he is dealing with in the jurisdiction he is working in. We are all well aware of the fire issues with batteries and fact that there are many types and brands of these machines. This paper will not be addressing the fire concerns and will just post some basic and simple information that we have found helpful in our work in terms of accident reconstruction.

The Limited Use Motorcycles tested were the Fly-7, 2021 Jetson LX-10 E-Scooter, and the 2019 CanAm 70cc ATV. For comparative purposes we also tested a 2023 GMC Sierra, 2018 Jeep Wrangler, and a 2016 EZ-GO S4 Golf cart. All the tests were done on the same described surfaces as the micromobility tests.

The main vehicle utilized in our testing was a Fly-7 Electric Limited Use Motorcycle with no modifications. This particular type of vehicle has a 1500 watt brushless electric motor and is more historically described more as a Moped. This, along with stand-up e-scooters are

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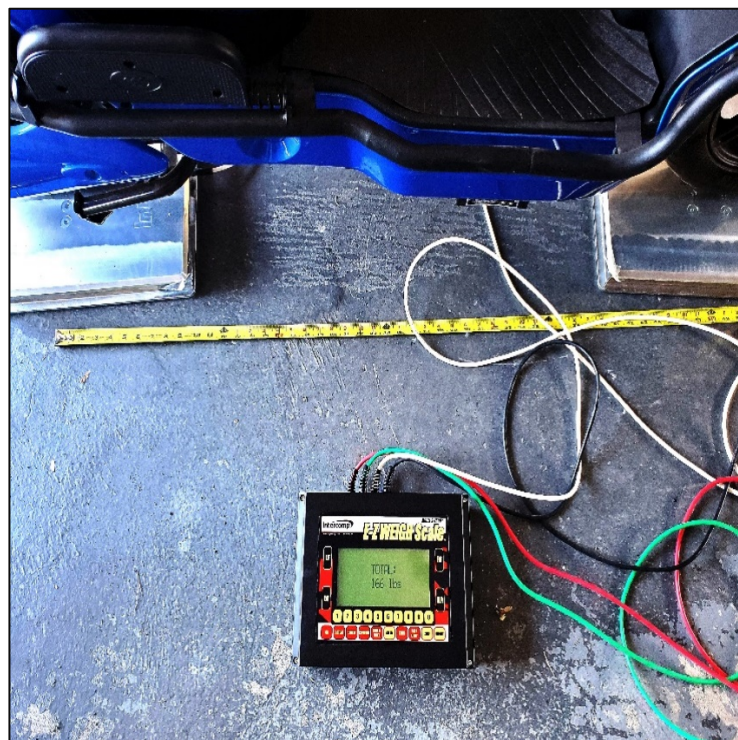
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two of the most popular types of micromobility vehicles readily seen on urban streets. The stand-up E-Scooters are commonly operated by children.

This Fly-7 vehicle has disc brakes front and rear (brakes are hand operated, one on each handlebar), rear foot pegs for a rear passenger, a maximum payload capacity of 350lbs, a maximum speed of 30mph, 10X3" new tires, and can be purchased with lead-acid or lithium ion batteries. We weighed the vehicle with a EZ Weigh Scale and found it to be 166lbs. The unit has 3 gears to choose from when riding.



This vehicle also is street legal and had brakes lights, directionals, rear view mirrors, and crash bars all around. Its range is approx. 20-25 miles with a 60V/20Ah Lead-acid battery,

55-65 miles with a 60V/50Ah Lithium-ion battery, and approx. 60-70 miles with a 60V/55AH Lithium-ion battery.

By the New York City chart illustrated later on in this paper, this test bike is a Class B Limited use Motorcycle/Moped since its top speed is 30mph and does require a driver's license but no motorcycle endorsement. The same type of bike with a top speed of 40mph would be a Class A Limited use Motorcycle and requires a drivers license as well as a motorcycle endorsement. This type of vehicle is more often operated by adults since it is street legal and, as such, is more expensive than lower level models.

Testing and Results

We used a Vericom VC3000 accelerometer to analyze the acceleration and braking capabilities of the vehicles tested: The minute details and parameters that go with the Vericom VC3000 will not be addressed here since we pretty much all are familiar with these units.

We used a Bushnell Radar Gun Model # 101911 to give reference to the numbers generated by the Vericom unit.

The tests were conducted on a dry, straight, and level semi-polished blacktop driveway, a dry and level straight gravel road, and a dry level straight grass field located at Collision Research Ltd. in Tillson, NY.

Just to get a relative feel for the numbers, we also did some skid tests at these locations with a 2018 Jeep Wrangler, a 2020CanAm 70cc ATV, and EZ-GO S4 Golf Cart with All Terrain

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Tires(Similar to ATV Mud Tires) and a 2023 GMC Sierra. All of the vehicles tested had excellent tires and brakes.

We used 4 test drivers. Test Driver #1 was 4'4" tall weighing 110lbs. Test Driver #2 was 5'3" tall weighing 170lbs. Test Driver #3 was 5'8" tall weighing 160lbs, and Test Driver #4 was 5'9" weighing 350lbs.

Braking Tests

| Test # | Vehicle | Vehicle/Rider Weight | Braking | Speed mph | Ave. g | Peak -g | Device | Travel Medium |
|--------|---------|----------------------|-------------|-----------|--------|---------|--------|---------------|
| | | | | | | | | Paved |
| 1 | Fly-7 | 166/170 | Both @ 100% | 9.59 | .45 | .68 | VC3000 | Paved |
| 2 | Fly-7 | 166/170 | Both @ 100% | 10.8 | .49 | .99 | VC3000 | Paved |
| 3 | Fly-7 | 166/170 | Both @ 100% | 11.7 | .41 | .68 | VC3000 | Paved |
| 4 | Fly-7 | 166/170 | Both @ 100% | 10.3 | .38 | .55 | VC3000 | Paved |
| 5 | Fly-7 | 166/170 | Both @ 100% | 13 | .48 | .89 | VC3000 | Paved |
| 6 | Fly-7 | 166/170 | Rear @ 100% | 11.3 | .23 | .42 | VC3000 | Gravel |
| 7 | Fly-7 | 166/170 | Rear @ 100% | 12.4 | .33 | .65 | VC3000 | Gravel |
| 8 | Fly-7 | 166/170 | Rear @ 100% | 9.0 | .23 | .51 | VC3000 | Grass |
| 9 | Fly-7 | 166/170 | Rear @ 100% | 10.6 | .22 | .52 | VC3000 | Grass |
| 10 | Fly-7 | 166/170 | Rear @ 100% | 10.9 | .37 | .57 | VC3000 | Paved |
| 11 | Fly-7 | 166/170 | Rear @ 100% | 9.0 | .21 | .51 | VC3000 | Grass |
| | | | | | | | | |
| Test # | Vehicle | Vehicle/Rider Weight | Braking | Speed MPH | Ave. g | Peak -g | Device | Travel Medium |
| | | | | | | | | |
| 12 | Fly-7 | 166/170 | Rear @ 100% | 10.6 | .22 | .52 | VC3000 | Grass |
| 13 | Fly-7 | 166/170 | Rear @ 100% | 11.3 | .23 | .42 | VC3000 | Gravel |
| 14 | Fly-7 | 166/170 | Rear @ 100% | 12.4 | .33 | .65 | VC3000 | Gravel |
| 15 | Fly-7 | 166/170 | Rear @ 100% | 12.5 | .38 | .70 | VC3000 | Gravel |
| 16 | Fly-7 | 166/170 | Rear @ 100% | 11.7 | .37 | .54 | VC3000 | Paved |

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| | | | | | | | | |
|-------|-------|----------------------|-------------|-----------|---------|---------|--------|---------------|
| 17 | Fly-7 | 166/170 | Rear @ 100% | 12.8 | .38 | .53 | VC3000 | Paved |
| 18 | Fly-7 | 166/170 | Rear @ 100% | 14.7 | .36 | .61 | VC3000 | Paved |
| 19 | Fly-7 | 166/170 | Both @ 100% | 9.9 | .44 | .66 | VC3000 | Paved |
| 20 | Fly-7 | 166/170 | Both @ 100% | 9.59 | .45 | .68 | VC3000 | Paved |
| 21 | Fly-7 | 166/170 | Both @ 100% | 12.6 | .46 | .65 | VC3000 | Paved |
| 22 | Fly-7 | 166/170 | Both @ 100% | 15.45 | .45 | .85 | VC3000 | Paved |
| 23 | Fly-7 | 166/170 | Both @ 100% | 12.7 | .54 | .86 | VC3000 | Paved |
| 24 | Fly-7 | 166/110 | Rear @ 100% | 8.36 | .28 | .63 | VC3000 | Grass |
| 25 | Fly-7 | 166/110 | Rear @ 100% | 9.1 | .26 | .60 | VC3000 | Grass |
| Test# | Fly-7 | Vehicle/Rider Weight | Braking | Speed mph | Ave. -g | Peak -g | Device | Travel Medium |
| 26 | Fly-7 | 166/110 | Rear @ 100% | 11.7 | .23 | .45 | VC3000 | Gravel |
| 27 | Fly-7 | 166/110 | Rear @ 100% | 10.0 | .32 | .57 | VC3000 | Paved |
| 28 | Fly-7 | 166/110 | Rear @ 100% | 11.9 | .32 | .54 | VC3000 | Paved |

| Test # | Vehicle | Vehicle/Rider Weight | Braking | Speed mph | Ave. -g | Peak -g | Device | Travel Medium |
|--------|--------------------|----------------------|-------------|-----------|---------|---------|--------|---------------|
| | | | | | | | | |
| 29 | Fly-7 | 166/110 | Front @ 80% | 12.86 | .35 | .51 | VC3000 | Paved |
| 30 | Fly-7 | 166/110 | Front @ 80% | 16.21 | .63 | .98 | VC3000 | Gravel |
| 31 | Fly-7 | 166/110 | Front @ 80% | 6.8 | .61 | .99 | VC3000 | Gravel |
| 32 | Fly-7 | 166/350 | Front @ 80% | 10.7 | .27 | .51 | VC3000 | Gravel |
| 33 | Fly-7 | 166/350 | Both @ 100% | 10.2 | .35 | .61 | VC3000 | Gravel |
| 34 | Fly-7 | 166/350 | Both @ 100% | 10.8 | .49 | 1.0 | VC3000 | Gravel |
| 35 | Fly-7 | 166/350 | Both @ 100% | 11.7 | .41 | .68 | VC3000 | Paved |
| 36 | Fly-7 | 166/350 | Both @ 100% | 13.0 | .48 | .89 | VC3000 | Paved |
| 37 | Fly-7 | 166/350 | Front @ 80% | 10.5 | .33 | .56 | VC3000 | Gravel |
| 38 | Fly-7 | 166/350 | Front @ 80% | 12.0 | .38 | .61 | VC3000 | Gravel |
| 39 | Fly-7 | 166/350 | Front @ 80% | 12.1 | .36 | .6 | VC3000 | Paved |
| | | | | | | | | |
| 40 | EZ-GO S4 Golf Cart | 1101/390 | All @ 100% | 13.37 | .21 | .34 | VC3000 | Paved |
| 41 | EZ-GO S4 Golf Cart | 1101/390 | All @ 100% | 16.3 | .22 | .35 | VC3000 | Paved |
| 42 | EZ-GO S4 Golf Cart | 1101/390 | All @ 100% | 19.3 | .25 | .34 | VC3000 | Paved |
| 43 | EZ-GO S4 Golf Cart | 1101/390 | All @ 100% | 21.2 | .2 | .31 | VC3000 | Paved |

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| 44 | Can Am 70cc ATV | 290/110 | All @ 100% | 15.5 | .34 | .49 | VC3000 | Paved |
|--------|------------------|----------------------|-------------|-----------|---------|---------|--------|---------------|
| 45 | Can Am 70cc ATV | 290/110 | Rear | 10.27 | .18 | .50 | VC3000 | Paved |
| 46 | Can Am 70cc ATV | 290/110 | Front | 14.3 | .25 | .48 | VC3000 | Paved |
| 47 | Can Am 70cc ATV | 290/170 | All @ 100% | 15.0 | .2 | .52 | VC3000 | Paved |
| 48 | Can Am 70cc ATV | 290/170 | Rear | 17 | .25 | .51 | VC3000 | Paved |
| 49 | Can Am 70cc ATV | 290/170 | Front | 13 | .22 | .40 | VC3000 | Paved |
| 50 | Jetson E-Scooter | 290/110 | Rear @ 100% | 6.8 | .15 | .19 | VC3000 | Paved |
| Test # | Vehicle | Vehicle/Rider Weight | Braking | Speed mph | Ave. -g | Peak -g | Device | Travel Medium |
| 51 | Jetson E-Scooter | 290/110 | Rear @ 100% | 10.87 | .1 | .7 | VC3000 | Paved |
| 52 | Jetson E-Scooter | 290/110 | Rear @ 100% | 12.50 | .22 | .61 | VC3000 | Paved |
| 53 | Jetson E-Scooter | 290/110 | Rear @ 100% | 8.25 | .28 | .62 | VC3000 | Paved |
| 54 | Jetson E-Scooter | 290/110 | Rear @ 100% | 9.20 | .17 | .3 | VC3000 | Paved |

| Test # | Vehicle | Driver | Braking | Speed mph | Ave. g | Peak -g | Device | Travel Medium |
|--------|----------|--------|------------|-----------|--------|---------|--------|---------------|
| 55 | Wrangler | RH | All @ 100% | 7.3 | .37 | .52 | VC3000 | Grass |
| 56 | Wrangler | RH | All @ 100% | 11.2 | .46 | .60 | VC3000 | Grass |
| 57 | Wrangler | RH | All @ 100% | 17.3 | .45 | .59 | VC3000 | Gravel |
| 58 | Wrangler | RH | All @ 100% | 20.7 | .49 | .61 | VC3000 | Paved |
| 59 | Wrangler | RH | All @ 100% | 22.1 | .46 | .55 | VC3000 | Gravel |
| 60 | Wrangler | RH | All @ 100% | 23.8 | .39 | .56 | VC3000 | Grass |
| 61 | Wrangler | RH | All @ 100% | 24.9 | .40 | .69 | VC3000 | Gravel |
| 62 | Wrangler | RH | All @ 100% | 26.1 | .51 | .79 | VC3000 | Paved |
| 63 | Wrangler | RH | All @ 100% | 28.4 | .41 | .90 | VC3000 | Grass |
| 64 | Wrangler | RH | All @ 100% | 34.7 | .41 | .73 | VC3000 | Grass |
| 65 | Wrangler | RH | All @ 100% | 15.4 | .49 | .49 | VC3000 | Paved |
| 66 | SIERRA | RH | All @ 100% | 21.8 | .59 | .75 | VC3000 | Paved |
| 67 | SIERRA | RH | All @ 100% | 27.8 | .69 | .82 | VC3000 | Paved |
| 68 | SIERRA | RH | All @ 100% | 28.2 | .69 | .81 | VC3000 | Paved |

Acceleration Tests

| Test # | Vehicle | Driver Weight | Acceleration Level | Speed mph | Distance(ft) / Time(Sec) | Ave. g | Device | Travel Medium |
|--------|---------|---------------|--------------------|-----------|--------------------------|--------|--------|---------------|
| 69 | Fly-7 | 170 | 100% | 29.3 | 100 / 4.8 | .24 | VC3000 | Paved |
| 70 | Fly-7 | 350 | 100% | 28.1 | 100/5.3 | .22 | VC3000 | Paved |
| 71 | Fly-7 | 110 | 100% | 30.3 | 200/6.1 | .33 | VC3000 | Paved |
| 72 | Fly-7 | 110 | 100% | 29.4 | 100/4.5 | .31 | VC3000 | Paved |
| 73 | Fly-7 | 170 | 100% | 29.3 | 100/4.7 | .28 | VC3000 | Paved |
| 74 | Fly-7 | 170 | 100% | 29.5 | 100/4.7 | .28 | VC3000 | Paved |

Classifications, Definitions, Laws

The classifications and descriptions of these vehicles cover a wide spectrum and I am sure there are different definitions, laws and classifications throughout the various government entities here and abroad. Overall, these products are commonly referred to as micromobility products. Although the term micromobility does seem to concentrate more on stand-up scooters, E-Bikes and Limited Use Motorcycles/Mopeds do show up in the literature as well. For this article, we are going to delve slightly into what we have in New York State and New York City just to illustrate some of what is written in the Vehicle and Traffic Laws and illustrate how confusing it can be. These vehicles in many cases create issues for Law Enforcement as it is often difficult out on the road to get the weight and top speed of such vehicles to properly apply the classification and determine what legal requirements have to be met. As an example, a Class A Limited use Motorcycle can look pretty much the same as a Class B. The difference according to the New York law is that a Class A has a top speed over 30mph, therefore requiring a motorcycle endorsement to the

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license, whereas the Class B with a top speed less than 30mph does not require the motorcycle endorsement.

The State of New York DMV says a Moped is the same as a Limited Use Motorcycle. The City of New York has a chart that pretty much shows the various types of small Electric Scooters, Bikes, and Motorcycles on the market with brief descriptions categorizing them. This chart pretty much follows the NYS V&T Law which defines Limited Use Motorcycles and similar type vehicles.

| E-BIKES & MORE | E-BIKE CLASS 1 | E-BIKE CLASS 2 | E-BIKE CLASS 3 | MOPED CLASS C | MOPED CLASS B | MOPED CLASS A | E-SCOOTER |
|---|----------------------------------|----------------------------------|-----------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------------------|
| Know the difference Not everything is an e-bike. Know the differences - and always ride legally and safely. | | | | | | | |
| | Pedal assist | Throttle with pedals | Throttle with pedals | Limited use motorcycle | Limited use motorcycle | Limited use motorcycle | Under 100 lbs |
| How fast can I go? | 20 MPH | 20 MPH | 25 MPH | 20 MPH | 30 MPH | 40 MPH | 15 MPH |
| Do I need a Driver's License? | NO (Must be 16) | NO (Must be 16) | NO (Must be 16) | YES | YES | YES (Plus M endorsement) | NO |
| Does my bike need a license plate? | NO | NO | NO | YES | YES | YES | NO |
| Does my bike need a Vehicle Identification Number (VIN)? | NO | NO | NO | YES | YES | YES | NO |
| Do I need to register my bike with the DMV? | NO | NO | NO | YES | YES | YES | NO |
| Can I ride in bike lanes? | YES | YES | YES | NO | NO | NO | YES |
| Can I ride in vehicle lanes? | YES* | YES* | YES* | YES** | YES** | YES** | YES* |
| Can I ride on bridges? | YES (Only in bike lanes) | YES (Only in bike lanes) | YES (Only in bike lanes) | YES† (Only in vehicle lanes) | YES† (Only in vehicle lanes) | YES† (Only in vehicle lanes) | YES (Only in bike lanes) |
| Can I ride in park drives and greenways? | YES | YES | YES | NO | NO | NO | YES |
| Do I need to wear a helmet? | RECOMMENDED (YES, if working) | RECOMMENDED (YES, if working) | YES | RECOMMENDED | YES | YES | RECOMMENDED |

* Vehicle lanes with speed limits no greater than 30 MPH ** Right lane and/or shoulder, except when making a left turn
 † Except the Brooklyn, Manhattan, Queensboro and Williamsburg Bridges

New York State Vehicle & Traffic Law Sections pertaining to Motorcycles, Scooters, Limited use Motorcycles, Electronic Assist Bicycles, Sidewalks, Roadways, Bicycle Paths, and Electronic Personal Assist Mobility Devices.

§ 121-b. Limited use motorcycle. A limited use vehicle having only two or three wheels, with a seat or saddle for the operator. A limited use motorcycle having a maximum performance speed, of more than thirty miles per hour but not more than forty miles per hour shall be a class A limited use motorcycle. A limited use motorcycle having a maximum performance speed of more than twenty miles per hour but not more than thirty miles per hour, shall be a class B limited use motorcycle. A limited use motorcycle having a maximum performance speed of not more than twenty miles per hour shall be a class C limited use motorcycle.

§ 114-e. Electric scooter. Every device weighing less than one hundred pounds that (a) has handlebars, a floorboard or a seat that can be stood or sat upon by the operator, and an electric motor, (b) can be powered by the electric motor and/or human power, and (c) has a maximum speed of no more than twenty miles per hour on a paved level surface when powered solely by the electric motor.

123. Motorcycle. Every motor vehicle having a seat or saddle for the use of the rider and designed to travel on not more than three wheels in contact with the ground, but excluding a tractor.

125-a. Off-highway motorcycle. Off-highway motorcycle is a motorcycle which is not equipped in conformity with the provisions of section three hundred eighty-one of this chapter, would not, if properly equipped, qualify as a limited use motorcycle, and which is manufactured and sold for operation primarily on off-highway trails or in off-highway competitions and only incidentally operated on public highways.

102-c. Bicycle with electric assist. A bicycle which is no more than thirty-six inches wide and has an electric motor of less than seven hundred fifty watts, equipped with operable pedals, meeting the equipment and manufacturing requirements for bicycles adopted by the Consumer Product Safety Commission under 16 C.F.R. Part 1512.1 et seq. and meeting the requirements of one of the following three classes: (a) "Class one bicycle with electric assist." A bicycle with electric assist having an electric motor that provides assistance only when the person operating such bicycle is pedaling, and that ceases to provide assistance when such bicycle reaches a speed of twenty miles per hour. (b) "Class two bicycle with electric assist." A bicycle with electric assist having an electric motor that may be used exclusively to propel such bicycle, and that is not capable of providing assistance when such bicycle reaches a speed of twenty miles per hour. (c) "Class three bicycle with electric assist." Solely within a city having a population of one million or more, a bicycle with electric assist having

an electric motor that may be used exclusively to propel such bicycle, and that is not capable of providing assistance when such bicycle reaches a speed of twenty-five miles per hour.

144. Sidewalk. That portion of a street between the curb lines, or the lateral lines of a roadway, and the adjacent property lines, intended for the use of pedestrians.

102-b. Bicycle path. A path physically separated from motorized vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way and which is intended for the use of bicycles.

A roadway is defined in the NYS V&T Law Section 140:

140. Roadway. That portion of a highway improved, designed, marked, or ordinarily used for vehicular travel, exclusive of the shoulder and slope. In the event a highway includes two or more separate roadways the term "roadway" as used herein shall refer to any such roadway separately but not to all such roadways collectively.

114-d. Electric personal assistive mobility device. Every self-balancing, two non-tandem wheeled device designed to transport one person by means of an electric propulsion system with an average output of not more than seven hundred fifty watts (one horsepower), and the maximum speed of which on a paved level surface, when propelled solely by its electric propulsion system while ridden by an operator weighing one hundred seventy pounds, is less than twelve and one-half miles per hour.

159. Vehicle. Every device in, upon, or by which any person or property is or may be transported or drawn upon a highway, except devices moved by human power or used exclusively upon stationary rails or tracks.

Some Rules, Definitions, and Laws in the City of New York

NYC gives the following definitions for E-bikes and E-scooters for their micromobility pilot program:

An e-bike is a bicycle that has a motor powered by a battery. E-bikes can take many forms, but generally look like a traditional bicycle with pedals and handlebars. During the pilot, E-bikes are allowed to be operated on New York City park drives and greenways.

NYC describes an E-scooter as a mobility device with a motor powered by a battery. E-scooters weigh less than 100 lbs and have handlebars and a floorboard that you stand on, or they can have a seat. During the pilot, E-scooters are allowed to be operated on New York City park drives and greenways.

NYC defines a "greenway" a designated path that is used for walking, jogging, rolling, stroller pushing, cycling, skating, etc. Greenway paths exist in parks and on streets that connect to parks and other open spaces. Greenways are often designated by specific signage and striped lanes.

NYC defines a 'park drive' as a road inside a park that is used by authorized vehicles (such as maintenance vehicles) to safely navigate the park. Though park drives are not open to general car traffic, they are busy with recreational users, walking, jogging, stroller pushing, cycling, skating, etc. Park drives are like large greenways, but sometimes they form a loop in a park rather than connect different parks to each other.

NYC defines a Pedal-Assist bicycle as a bicycle equipped with fully operable pedals and an electric motor of less than seven hundred fifty watts (one horsepower) whereby such electric motor engages only when the operator is pedaling and the rate of speed of the bicycle is less than 20 miles per hour, and disengages or ceases to function when (i) the

operator applies the brakes, (ii) the operator stops pedaling, or (iii) the bicycle achieves a speed of twenty miles per hour. A pedal-assist bicycle shall not be equipped with any throttle capacity or have any additional motorized equipment affixed to it.

I will leave getting more detail on any idiosyncrasies on this for the lawyers to deal with. I guess the important thing here is that if you are doing a case with a similar type of small electronic vehicle, make sure you research the applicable laws, rules, regulations, and classifications in the appropriate jurisdiction.

One thing to remember is that in New York, and most likely similar in other venues, there are several consolidations of laws they may tie into to each other in unexpected ways. We have found this to be true in our Snowmobile and ATV work in many places throughout the USA and Canada. You can rest assured that the attorneys will investigate all of these, and if there are confusing issues, they may very well be brought to light. In New York, at the very least, we have the Vehicle and Traffic Law, Dept of Environmental Conservation Law, the New York Code of Rules and Regulations, the Highway Law, Transportation Law, and local County, Town, Village, and City Laws.

Conclusion

The two main take aways from this paper are:

1. The test results providing a frame of reference for these types of vehicles based on actual skid and acceleration tests.



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2. The fact that the reconstructionist should make sure he understands all of the classifications, rules, laws, and definitions for the vehicle he is dealing with in the venue he is working in.