

E-Bikes e-xplained

Andreas Kemkes - July 22th, 2026

The Headlines



What is an E-Bike?

The bikes everyone is mad at are not e-bikes, they are e-motorcycles.



A Class System (*)

- Class 1: no throttle - up to 20mph
- Class 2: Class 1 plus throttle only mode
- Class 3: Class 2 plus pedaling only mode up to 28mph

(*) Software can change a Class 1 bike into a Class 2 or 3 bike or even an off-road only bike.

Class 1

Provides assistance **only when the rider is pedaling** and ceases to provide assistance when the bicycle reaches a **speed of 20 mph.**



Class 2

Operates via **pedal-assist or throttle** and ceases to provide assistance when the bicycle reaches a **speed of 20 mph.**



Class 3

Provides assistance **only when the rider is pedaling** and ceases to provide assistance when the bicycle reaches a **speed of 28 mph.**



E-Motos

Electric devices built on a bicycle-style frame equipped with one or more operating modes and a throttle. Often lacks operable pedals. **Exceeds 20 mph on motor power alone** when the throttle is engaged. **Motor exceeds 750 watts.**



Lock, Stock and Two Smoking Barrels (*)

- Street Legal Mode (Stock): limited to 20 mph via throttle or pedal assist with a 750W nominal motor capability, generally permitted on public streets, bike lanes, and multi-use paths where traditional e-bikes are allowed.
- Off-Road Mode (Unlocked): speeds exceeding 28 mph (up to ~37 mph) and higher peak power draw (up to 1000W+), strictly restricted to private property or off-road courses. Usually violates local e-bike classifications and requires proper motor vehicle registration, a license, and insurance.

(*) reference to 1998 Comedy/Crime Movie

Random User Quotes

- “I have never ridden it in any other mode than Off-road + Boost.”
- “You’re completely fine if you leave it at class 2, but as far as I know nobody does (I don’t) and it doesn’t seem to present a major issue.”
- “I’m respectful in bike lanes but I do punch it when I’m riding in the street.”
- “Main problem will be less on the law enforcement side and more on the HOA/Karen side.”
- “As long as you are obeying traffic laws they won't even waste their time.”

California E-Bike Bills

- Two highly restrictive California e-bike bills, AB 1557 and AB 1942, died in the Assembly Appropriations Committee. AB 2284 didn't make the summer cut-off.
- ... and more e-bike bills: SB 1271, AB 1614 and AB 1774.
- ... also some local ones, targeting specific counties: SB 956, AB 1778, AB 2234 and AB 2595.
- ... with 2 major companion bills still going through the legislative process: SB 1167 and AB 2346.

Failed in the process

- AB 1557 proposed to cap Class 1 and 2 e-bike speeds at 16 mph, limiting continuous power to 250 watts, and restricting usage for riders under 16.
- AB 1942 would have required all owners of Class 2 and Class 3 e-bikes to mount a physical, visible license plate on the rear frame, introduced an annual registration system and fee structure, given law enforcement the right to ticket riders for failing to display their registration plates on public streets.
- AB 2284 required the California Attorney General to publish an official public list identifying electric two-wheelers that are falsely advertised or sold as street-legal e-bikes.

Enacted as law

- SB 1271: Mandatory Fire-Safety Certification and Class 3 Throttle Ban above 20mph. (took full effect in January 2026)
- AB 1614: Made it illegal to carry a passenger on an e-bike. Added Class 1 bikeways, and child safety seat rules. (officially signed into law on June 30, 2026)
- AB 1774: Ban on Speed-Mod Kits and Automatic Vehicle Reclassification, i.e., reclassified as an unregistered motor vehicle, granting police the authority to cite the rider and impound the bike on public streets. (signed into law by Governor Newsom on July 2, 2024, and became legally enforceable on January 1, 2025)

Coming soon to your neighborhood (1)

- SB 1167 (waiting on full Assembly floor for its final vote before August 31, 2026)
 - Makes it a crime to label or market any vehicle as an "e-bike" if it exceeds 750 Watts of power or is easily modified to bypass 28 mph speed caps.
 - Any electric two-wheeler that exceeds standard consumer e-bike limits is legally stripped of the bicycle title.
 - Mandatory Point-of-Sale Disclosures: clear messaging for illegal vehicles at point of sale
 - Authorized Vehicle Impoundment: impacts unauthorized vehicles traveling faster than 20mph on a throttle
 - Crash Report Mandates: requires police to record certain specifics about the vehicles to determine if it is an e-bike or an illegal e-motorcycle.

Coming soon to your neighborhood (2)

- AB 2346 (cleared legislature on August 19, 2026, sent to Governor to be signed or vetoed)
 - Mandatory Speedometers and Built-in Safety Lighting by 2029
 - 10mph Sidewalk Speed Limits
 - Grants local cities and counties the authority to lower speed limits on paved bike paths and multi-use trails based on pedestrian density.
 - Youth Safety Recommendation, i.e., recommending speed limit of 15mph for younger riders through point-of-sales advisories.

What's happening in other states?

- New Jersey: Requires a **valid driver's license** (or a specialized motorized bicycle license for 15-to-16-year-olds), **register** the e-bike with the Motor Vehicle Commission (MVC), and carry **liability insurance**. It also completely bans online internet sales of e-bikes within the state. - Bill S4834 / A6235 (Enacted January 2026, Full Enforcement July 19, 2026)
- Washington: Mandates that if an e-vehicle can exceed 20 mph on throttle alone, it is a motorcycle. Crucially, it dictates that any e-bike designed to be **easily reconfigured** using a software setting, menu passcode, button, or app is **legally no longer an e-bike**. - Senate Bill 6110 (Effective June 11, 2026)
- The law implements a mandatory \$30 e-bike registration fee, raises the mandatory helmet age to under 18, and forces anyone **under 16 years old to ride under the "direct supervision"** of a parent or guardian when operating a Class 2 or Class 3 e-bike. It also **bans "non-standard riding positions"** on public paths. - House Bill 2021 / Act 259 (Signed into Law July 15, 2026)



Backup Slides

Everything you always wanted to know about E-Bikes ...

- Cadence Sensor vs. Torque Sensor
- PAS (Pedal Assist) Levels
- Hub Motors vs. Mid-Drive Motors
- Peak Output vs. Continuous Output
- Capacity and Range

Weighing In

Destructive crash force is calculated using the kinetic energy formula ($KE = \frac{1}{2}mv^2$).

Vehicle Type	Estimated Total Weight	Speed
Class 3 E-Bike	~235 lbs	28 mph
Passenger Car	~4,000 lbs	~7 mph
Cybertruck	~7,000 lbs	~5 mph

7 mph is about the speed of a rolling car in a parking lot