

E-Bikes at a Crossroads: What California Cities Can Do Now

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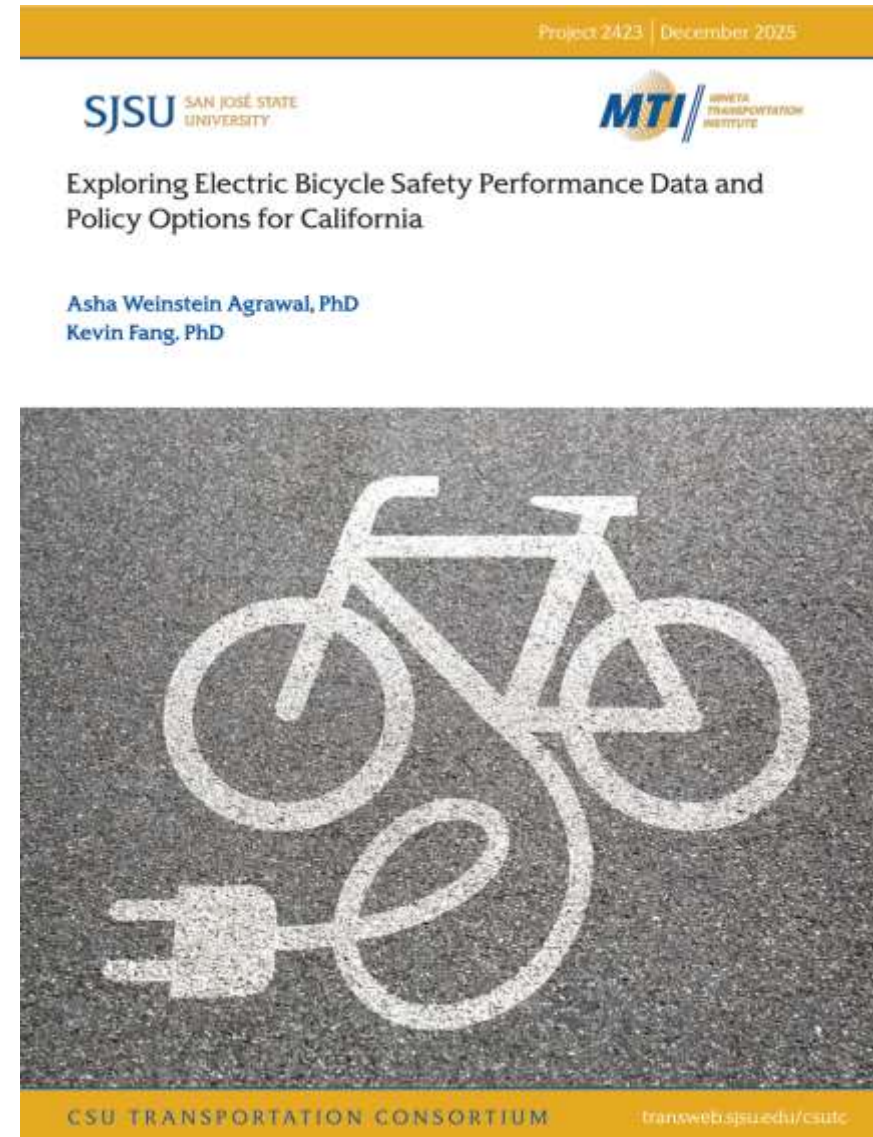
Exploring Electric Bicycle Definitions and Incident Trends

Dr. Kevin Fang – Sonoma State University



Outline

- 1) What's an e-bike?...
Definition challenges
- 2) Safety incident data
and major trends



Bill commissioned by SB 381 (2023)
Funded by Mineta Transportation Institute

So, you're interested in e-bike safety...
What even is an e-bike?

Which of these is an electric bicycle?

1



2



3



4



5



6



7



8



9



Which of these is an electric bicycle?



Differing definitions...

- What is **legally an “electric bicycle”**
- What **a consumer/user considers to be an e-bike**
- What **industry advertises as e-bike**
 - Devices clearly legal “electric bicycles”
 - Devices individual manufacturers consider to be legal “electric bicycles” but whether they are is questionable
 - Devices marketed as e-bikes where the fine print acknowledges they’re not street legal

Legal “electric bicycles”

Laws in most US states...

- A device with operable pedals
- Maximum motor power of 750 watts

	Class 1	Class 2	Class 3
Electric power is applied:	Only when rider is pedaling	When rider is pedaling or by hand throttle	Only when rider is pedaling
Speed above which power will no longer be applied	20 mph	20 mph	28 mph

Class 1-3 electric bicycles have the same rights and responsibilities as human-powered bicycles

Clearly not street-legal...

- Devices far exceed power and speed maximums
- Manufacturers state* for off-road use only

Sometimes referred
to as...
E-motos
Out of class
E-mopeds
E-motorcycles



Segway Xyber Electric Bike

~~\$2,899.99~~ ~~\$3,299.99~~ MSRP ⓘ

📦 In Stock

Notes:

*Product recommended for riders 18 years and older, for off-road use only. Riders must follow all local, state and federal regulations.

Power Performance	Rated Power	1 Battery = 3000 Watts, 2 Batteries= 6000 Watts
	Max. Torque	1 Battery = 120 Nm, 2 Batteries= 175 Nm
	Max. Speed	Off-road use only; 35 mph max with speed limiter available in App
	Max. Range	1 Battery = up to 56 miles, 2 Batteries=up to 112 miles

Marketed as very powerful... but also legal

- **Some manufacturers market devices as being street-legal, but also faster/more powerful than legal limits**
- Such devices marketed and/or shipped as Class 2 Electric Bicycles
- But, can be **“unlocked” to higher power/speed**



Is the AIPAS M2 Pro the FASTEST Electric

Watch later Share

MORE VIDEOS

0:00 / 28:26 • Intro

YouTube

Urban Commuting

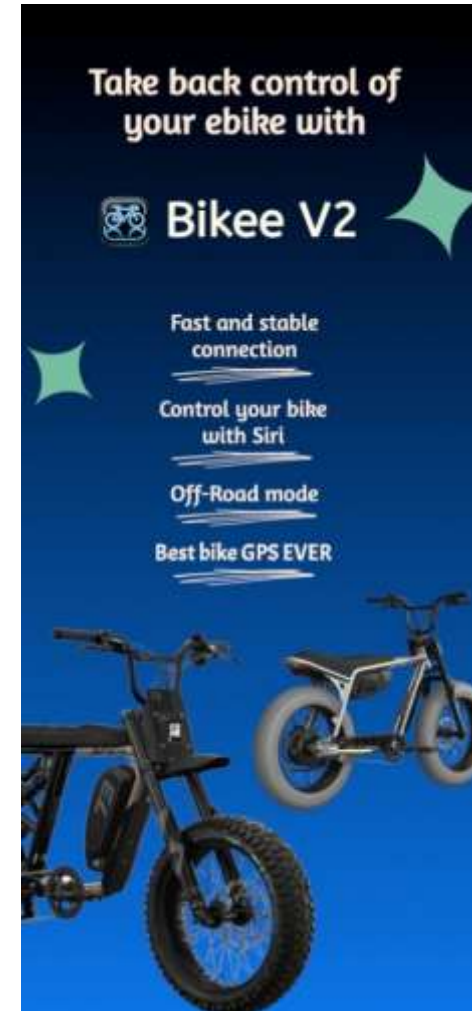
⚡ Aipas M2 Pro can be unlocked from class 2 (20 mph) to class 3 speeds (up to 36 mph).

- 🚲 Equipped with a 1,800W motor and 110 Nm torque, enabling strong hill climbing and off-road capability.
- 📱 Full-color, sunlight-readable display with intuitive controls and detailed ride info (speed, battery, trip).
- 🔋 Equipped 48V 17.5Ah battery with 840Wh power.
- ☔ IP65 water resistance, puncture-resistant tires, and robust suspension enhance durability and comfort.

California SB 1271 (2024)

Banned officially-sanctioned unlocking...

- Devices where manufacturers *intend* for operators to be able to unlock higher power and higher speed settings do not qualify as “electric bicycles”
 - Cannot be sold, marketed, or labeled as such
- While SB 1271 banned manufacturer sanctioned unlocking, **third-party unlocking apps are easy to find**

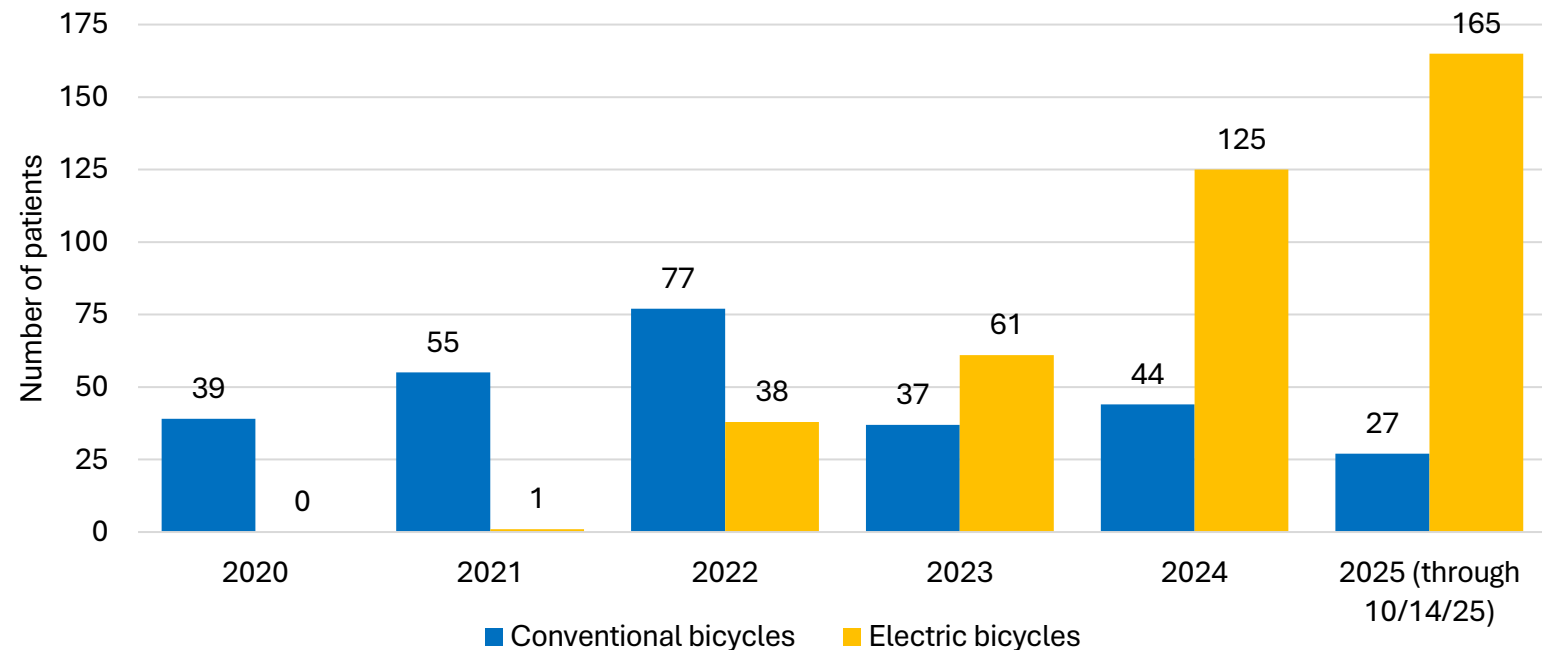


E-bike incident stats

*Keeping in mind some proportion of these incidents involve legal electric bicycles while others involve more powerful/non-street-legal devices

In some e-bike hotspots, e-bike injuries have exceeded conventional bicycle injuries

EB & bicycle trauma activation patients treated at Rady's Children's Hospital, Orange County



Source: Personal correspondence with Dr. Laura F. Goodman, Trauma Medical Director, Rady Children's Health of Orange County, November 11, 2025.

Notes: "Trauma activation" patents are the most seriously injured patients.

Data for 2025 was available only through October 14, 2025.

Devices involved in incidents attributed to EBs are not necessarily legal EBs.

Some data shows somewhat similar injury severity for e-bikes vs. conventional bicycles...

Injuries in all locations			Injuries on streets		
	Electric bicycles	Conventional bicycles		Electric bicycles	Conventional bicycles
Hospitalization rate	16%	13%	Hospitalization rate	17%	18%
Head injuries	23%	19%	Head injuries	23%	23%
Multiple injuries sustained	57%	41%	Multiple injuries sustained	63%	54%

Source: Data from the National Electronic Injury Surveillance System (NEISS), produced by the US Consumer Product Safety Commission
Note: Devices involved in incidents attributed to EBs are not necessarily legal EBs.

...but, some data shows notably more severe outcomes for e-bikes vs. conventional bicycles

Injuries and fatalities, New York City (2023-25*)

	Injuries	Fatalities	Ratio of injuries per fatality
Motorcycle	4,065	112	36
Electric bicycle	2,172	44	49
Pedestrian	24,415	306	80
Moped	6,215	34	184
Stand-up scooter	3,427	17	202
Conventional bicycle	12,666	24	528
Car	52,835	95	556
SUV	34,742	43	808

Source: Authors' analysis of data from the NYPD TrafficStat Dashboard.

Notes: Data covers incidents from 1/1/23-12/22/23, 1/1/24-1/22/24, and 1/1/25-11/2/25.

Devices involved in incidents attributed to EBs are not necessarily legal EBs.

Most injuries from solo crashes, most fatalities involve motor vehicle collisions

Share of incidents involving motor vehicle collisions

	Date	Electric bicycles	Conventional bicycles
Injuries at ERs, national ¹	2024	31%	24%
Injuries at ERs, California ²	2023	20%	18%
Fatalities, national ³	2019 - 2025	70%	–

Sources: (1) Data from the National Electronic Injury Surveillance System (NEISS), produced by the US Consumer Product Safety Commission; (2) Authors' analysis of California Health & Human Services data; (3) Authors' search for news articles, 2019 to July 2025

Note: Devices involved in incidents attributed to EBs are not necessarily legal EBs.

Age distribution (fatalities)

Age	Share of cases (age-reported only)
0 – 17	17%
18 – 29	13%
30 – 39	20%
40 – 49	14%
50 – 64	20%
65+	16%

Source: Authors' search of 90 of 101 news media articles covering e-bike rider fatalities from 2019 to July 2025 that reported age of decedent.

Thank you

- Full report at:
<https://transweb.sjsu.edu/research/2423-Electric-Bicycle-Safety-Data-Policy>



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LAW ENFORCEMENT SUMMARY



Defining the problem



Policy design



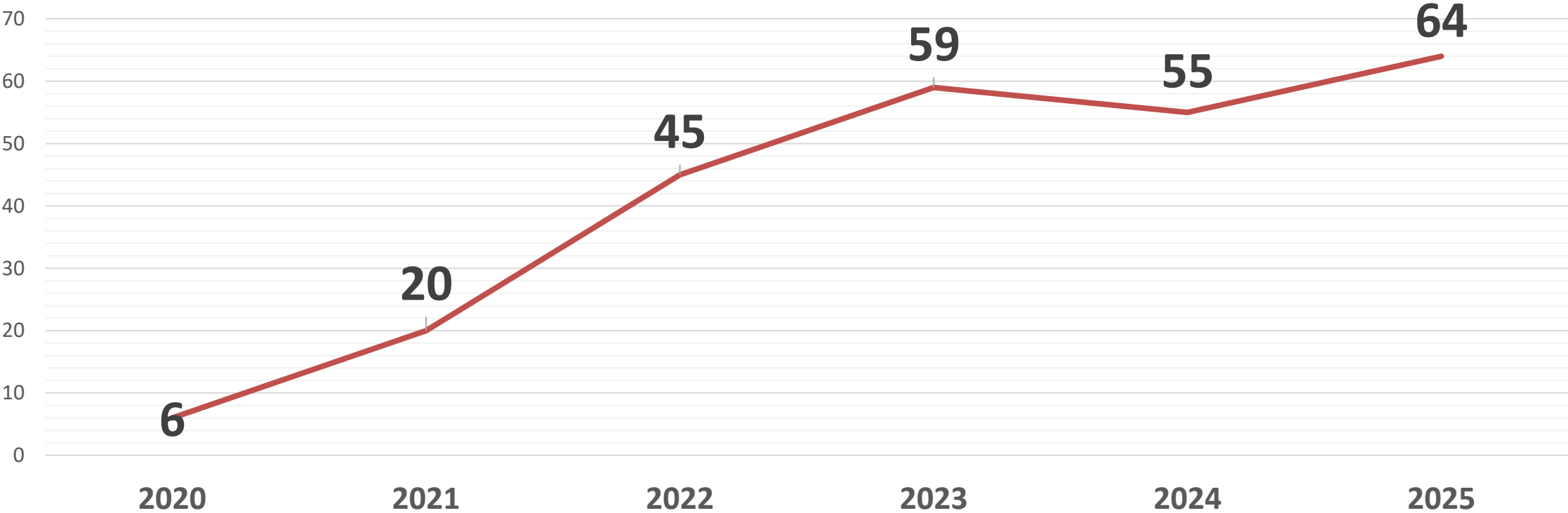
Implementation



Ongoing efforts

E-BIKE COLLISION DATA

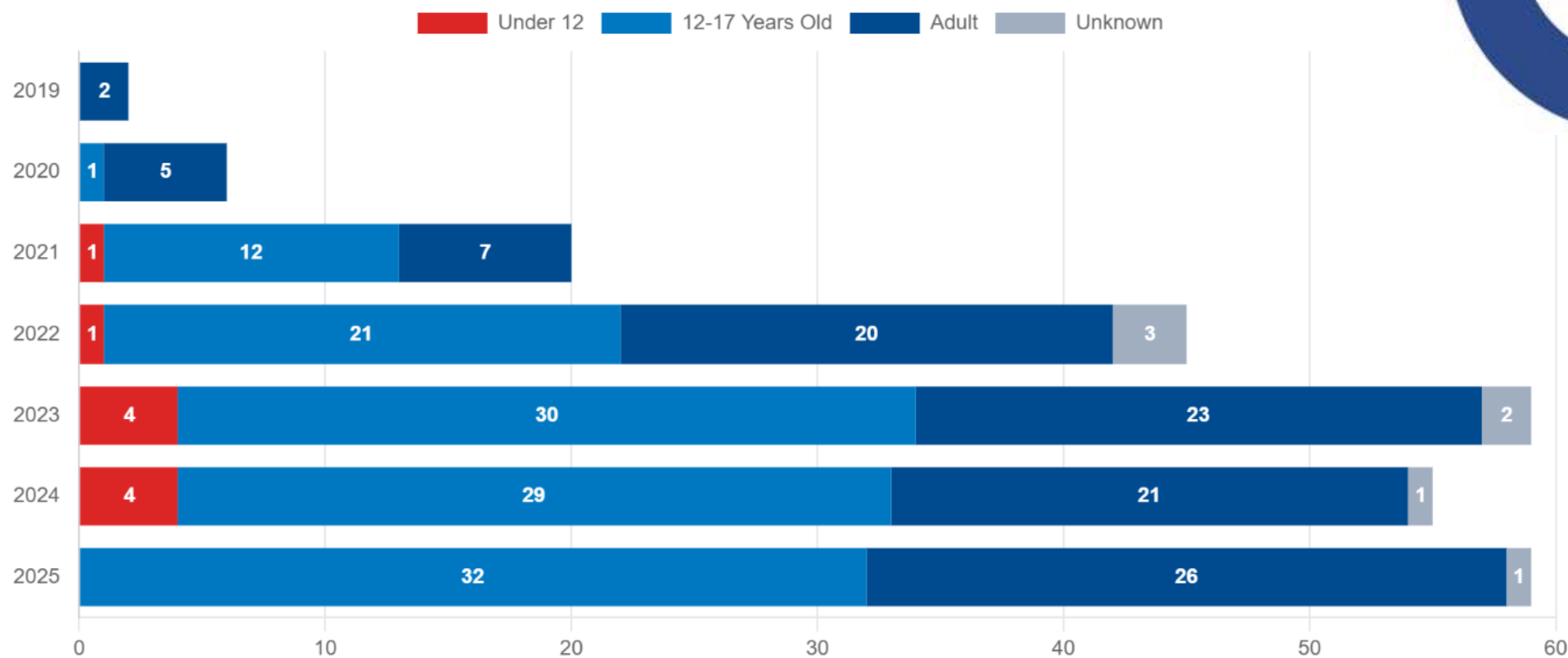
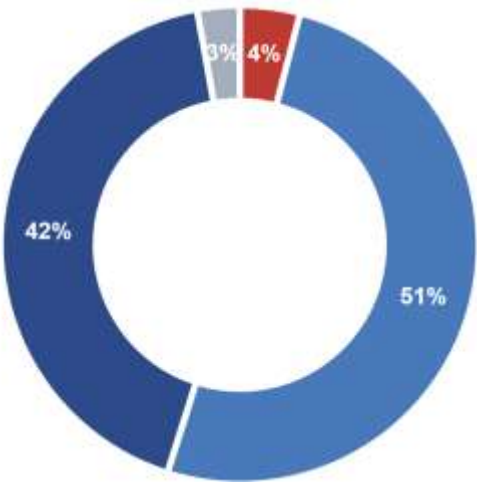
Yearly E-Bike Injury Collision Totals



E-BIKE COLLISION DATA

Detailed Yearly E-Bike Injury Breakdown by Age

This chart breaks down 246 collisions by age group for each year through Oct. 31, 2025.



E-BIKE TRAUMA INTAKE SUMMARY (2025–2026)

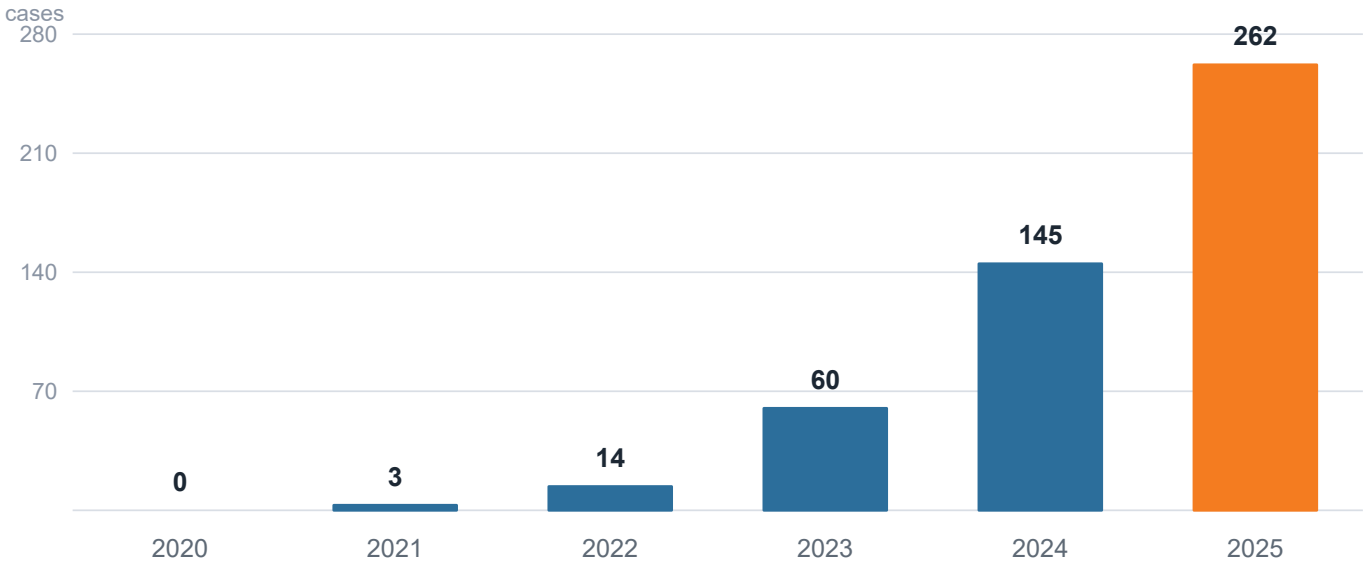
San Diego County hospital data show a sharp rise in severe e-bike injuries.

262 Rady pediatric trauma activations in 2025

≈90 Rady e-bike trauma cases in Q1 2026

Rady Children’s Hospital: severe e-bike trauma activations

Cases requiring trauma-system activation



2026 trend: nearly 90 cases in Q1; Rady says e-bikes are on pace to become its most common pediatric trauma cause this year.

Scripps 2025 e-bike case locations

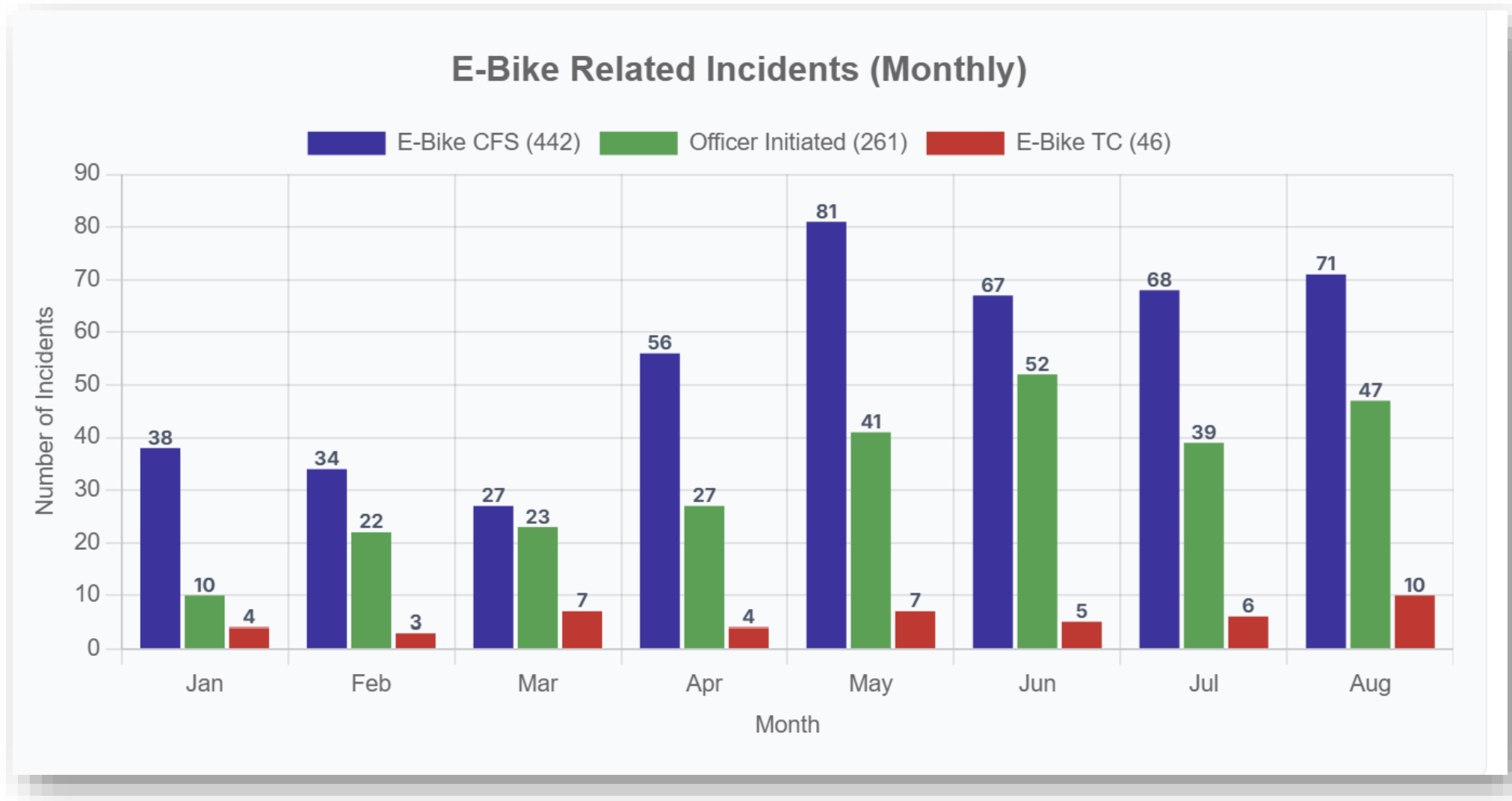
Oceanside	22%	Del Mar	4%
Carlsbad	18%	San Diego	4%
Encinitas	16%	Camp Pendleton	3%
Mira Mesa	7%	Rancho Penasquitos	3%
La Jolla	6%	University Town Center (UTC)	3%
Pacific Beach	5%	Carmel Valley	3%
Unknown	5%	Solana Beach	1%

Note: Scripps “Other / unknown” consolidates the nine remaining locations shown in the source slide. Rady data reflect trauma activations, not all e-bike emergency visits.

Sources: Rady Children’s Hospital San Diego data reported by Axios San Diego (May 21, 2026): <https://www.axios.com/local/san-diego/2026/05/21/e-bike-injuries-top-pediatric-trauma-cases>

Scripps Health, “Trauma Intake Summary (2025)” slide provided by user; Scripps e-bike safety context: https://www.scripps.org/news_items/8035-scripps-mds-discuss-dangers-of-e-bikes-during-police-press-conference

ENFORCEMENT – COLLISION SUMMARY (2025)



BUILDING THE TEAM



City Attorney's Office
Police Department
Intergovernmental Affairs
Transportation
Communication &
Engagement



City Council
City & Schools Committee
Legislative Subcommittee
Transportation Commission



School districts
Mobility groups
Interested community
members

ORDINANCE SUMMARY

Modernized Regulations

- Updated definitions aligned with state law
- Clearly identified unsafe riding behaviors

Minimum Age Framework (AB 2234 Pilot)

- Under-12 prohibition for Class 1 & 2 e-bikes
- Education-based enforcement with parental accountability

Targeted Enforcement Tools

- Authority to impound e-bikes when there is an immediate safety risk to a minor
- Requirement for CHP e-bike training (AB 1946) with a parent present for release
- Administrative cost recovery for state-authorized impounds

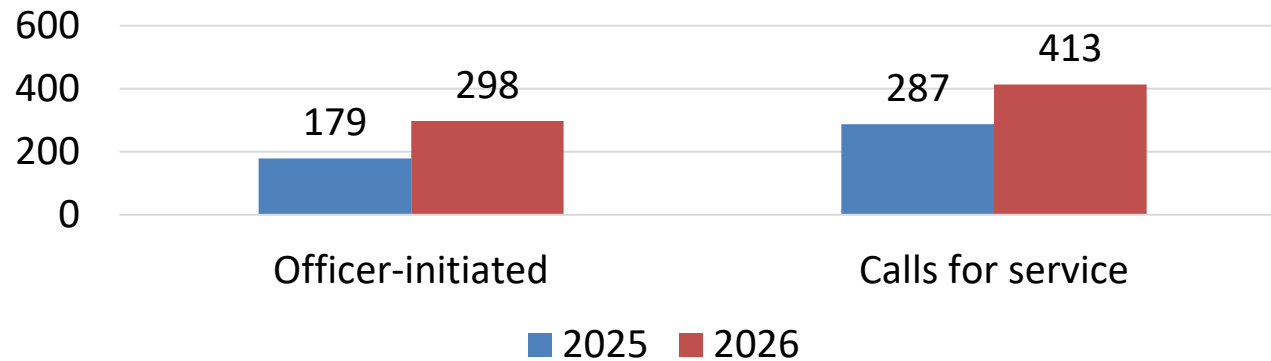
Park Safety Measures

- E-bike prohibition in Pine and Poinsettia Community Parks

SUMMER PRE/POST ORDINANCE

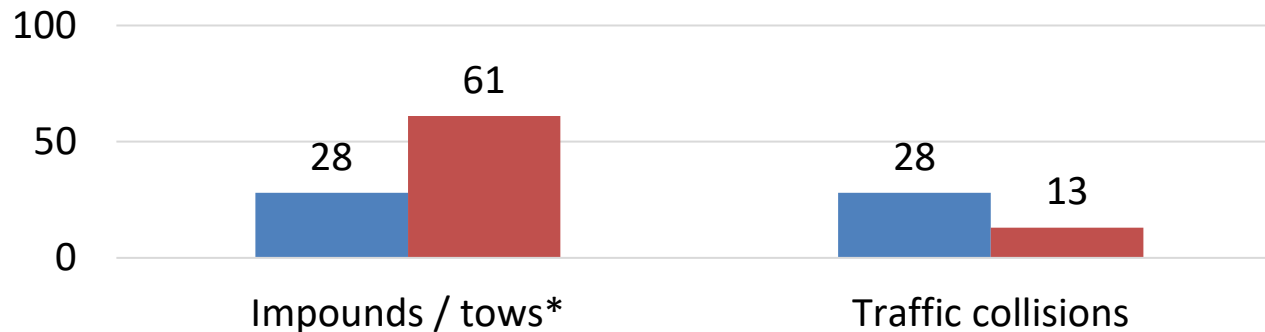
May to August 2025 vs. 2026

ACTIVITY



- **+44% calls for service**
- **+66% officer-initiated activity**
- **-54% traffic collisions**
- **+118% e-bike/e-mc impounds**

ENFORCEMENT & OUTCOMES



**Not directly comparable. The 2025 figure covers illegal e-motorcycles only; the 2026 figure also includes e-bike impounds.*

ONGOING EFFORTS



Community outreach
& education



Engineering



Enforcement



Data
analysis



Legislative
advocacy



E-BIKE

SAFETY

Know Before You Ride

City of Chula Vista Electric Micromobility Vehicle Ordinance



ELECTRIC MICROMOBILITY VEHICLE TOOLKIT

Let's Ride Safe, Chula Vista

www.chulavistaca.gov/ebike

*Refer to Chula Vista Municipal Code 10.73

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Overview

California Regulations

Under state law, helmets are required for anyone under 18 riding a Class 1 or Class 2 e-bike, and for all riders of Class 3 e-bikes. Riders are permitted to operate Class 1 and 2 e-bikes on sidewalks, and Class 3 e-bikes are also allowed unless restricted by local regulations. There are no statewide minimum age requirements for operating Class 1 or Class 2 e-bikes, and passengers are allowed without restrictions. Motorized scooters are permitted to operate outside of Class II or Class IV bikeways on roadways with speed limits of up to 35 miles per hour. Additionally, the maximum speed limit for motorized scooters is 15 miles per hour. This speed limit applies on all roadways and bikeways, regardless of whether the posted speed limit for other vehicles is higher.

Chula Vista's New Ordinance

Chula Vista's ordinance which takes effect on September 4, 2025, adds safer local requirements. Riders must now be at least 12 years old to operate Class 1 or Class 2 e-bikes. Passengers are not permitted unless the rider is 18 or older. Class 1 and 2 e-bikes are prohibited on sidewalks in business districts and anywhere signs are posted. Class 3 e-bikes are prohibited on all sidewalks within the city. Helmets remain mandatory for all Class 3 riders and for anyone under 18 on Class 1 or Class 2 e-bikes, consistent with state law. No motorized scooters on roads with speed limits 40 MPH + except when riding within a striped bike lane or separated bikeway.

What has changed?

Chula Vista has introduced minimum age requirements and specific sidewalk restrictions that go beyond state law. The City has also added clear rules about carrying passengers, limiting this to riders age 18 and older. Education will be the first priority, with workshops, school programs, and community outreach offered to help families learn the rules. Enforcement will begin on December 3, 2025, with a \$25 fine for infraction of ordinance. Certain cases will allow for a [safety course](#) to avoid a fine. Persistent violations may result in impoundment of the e-bike or restrictions on using City-owned facilities.

These updates align local rules with community needs, especially around schools, parks, and business areas, where safety is a top concern. By combining education and enforcement, the City's goal is to build safer habits and ensure that students and families can enjoy the benefits of e-bikes while reducing risks on Chula Vista's roads and sidewalks.





EMAIL TO PARENTS/GUARDIANS

- Schools will be able to send an email to parents/guardians to inform them of the New E-Bike Safety Rules

Subject:

Important: New Safety Rules in Chula Vista

Dear Parents and/or Guardians,

Beginning September 4, 2025, new electric micromobility vehicle rules will take effect in Chula Vista to help keep our students and community safe. While California already has e-bike and bike laws, the City has added local updates that affect students directly.

What's New:

- Riders must be at least 12 years old to operate Class 1 or Class 2 e-bikes.
- Riders must be at least 18 years old to carry passengers.
- Class 1 and Class 2 e-bikes are not allowed on sidewalks in business districts or where posted.
- Class 3 e-bikes are not allowed on any sidewalks.
- Helmets are still required for all riders under 18 on Class 1 and Class 2 e-bikes, and for all ages on Class 3 e-bikes.

The City will focus on education first, with workshops, free safety classes, and school programs before issuing citations. Enforcement will begin Dec. 3, 2025. A violation of 10.73.040(a) shall be an infraction with a fine of \$25 or in certain cases, fines can be avoided by attending a [safety course](#). All other violations shall be punishable as an infraction with a fine of \$50 for the first conviction and \$100 for the second conviction. A maximum fine of up to \$250 may be imposed for each conviction thereafter. Individuals with three or more infractions may be permanently banned from using City-owned facilities. Option to complete a [safety course](#) to avoid fines will be available on a case-by-case basis. The City may also seize and store any electric micromobility vehicle found in violation, with the owner responsible for storage fees. Minors' vehicles may be impounded and the parent or guardian notified.

We encourage you to talk with your child about these rules and help them practice safe riding habits. For more information visit: chulavistaca.gov/ebikes

Thank you for helping keep our students safe on the road.

Sincerely,

[Name]

[Title/School or District Name]

[Contact Information]



STUDENT PLEDGE FOR CHULA VISTA ELEMENTARY SCHOOL DISTRICT

- ♦ [Children will be able to complete the pledge by signing a virtual form.](#)

**I pledge to wear my helmet tight,
to keep me safe day and night.**

**I ride where bikes are meant to go,
and follow signs that tell me so.**

**I stop at lights, I never race,
I keep a steady lawful pace.**

**I watch for people, cars,
and more for my own safety and all of yours.**

**I won't ride e-bikes until I am twelve,
that's a rule I'll keep myself.**

**No passengers until I am eighteen,
because Chula Vista is the safest city I have seen.**



FAQ

1. When do the new rules take effect?

The new e-bike rules in Chula Vista begin on September 4, 2025.

2. Why are these rules changing?

The changes are designed to improve safety for riders, pedestrians, and drivers – especially near schools, parks, and high-traffic community areas.

3. What is California AB 2234?

A new pilot program under California's AB 2234 gives local governments in San Diego County the power to restrict Class 1 and 2 e-bike use by children under 12. The pilot program will end on January 1, 2029.

4. What are “unusual conditions” that affect speed limits?

Certain locations may have special speed limit rules due to safety concerns, such as:

- Intersections near schools, fire stations, playgrounds, senior centers, or amusement parks.
- Areas with visibility obstructions or steep downhill grades greater than 6%.
- Streets where approach speeds exceed the posted speed limit.

5. Why can't speed limits be posted lower than 25 mph everywhere?

Under California law, the unposted speed limit for residential streets is 25 mph and can be enforced as is. Lower speed limits (15–20 mph) can only be posted along narrow streets and near schools, parks, and senior centers.

6. How will the new e-bike rules be enforced?

The City is prioritizing education and warnings through December 2, 2025. Enforcement begins December 3, 2025, with the following penalties:

- A violation of Section 10.73.040(a) is considered an infraction and carries a \$25 fine. In some cases, this fine may be waived if the individual completes a [safety course](#).
- For all other violations:
 - First conviction: \$50 fine
 - Second conviction: \$100 fine
 - Subsequent convictions: Up to \$250 fines
- Three or more violations may result in a permanent ban from City-owned facilities.
- E-bikes and other electric micromobility vehicles may be seized and stored at the owner's expense.
- If the rider is a minor, parents/guardians will be notified, and the vehicle may be impounded.

7. How do I report unsafe e-bike use?

Report incidents involving e-bikes, e-motorcycles, or other electric micromobility vehicles to the Chula Vista Police Department using this form: [Report an Incident](#)

8. How can parents help?

Talk with your child about these rules, ensure they have a properly fitted helmet, and encourage them to attend a safety class before riding.



E-BIKE SAFETY

City of Chula Vista Electric Micromobility Vehicle Ordinance

What is an Electric Micromobility Vehicle?

- >>> Electric micromobility vehicles, such as electric bicycles (e-bikes) and motorized scooters have a battery-powered motor.
- }}}- There are three classifications or types of e-bikes.
- >>>- An e-bike is equipped with fully operable pedals and a battery-powered motor that does not exceed 750 watts of power.

Know Before You Ride

				
No person under 12 years old may operate a Class 1 or 2 e-bike.	No riding Class 1 or 2 e-bikes on sidewalks in business districts and as signed.	Helmets ntqlured for operatorsMclers under 18 JWI'S old on motorized scooters, Class 1 and 2 e-bikes & all ages for Class 3 e-bikes.	No motorized scooters on roads with speed limits 40 MPH + except when riding within a striped bike lane or separated bikeway.	Operators under 18 years old may not transport or carry passengers .

Each electric micromobility vehicle has different rules.
Check the chart below to ride legally and safely in Chula Vista.

Know Your Ride				
	Class 1 E-Bike	Class 2 E-Bike	Class 3 E-Bike	Motorized Scooters
Pedal assist	Pedal-assist only Electric motor only engages while operator/rider is pedaling	Motor assists when pedaling or by throttle Bectric motor can be engaged at anytime w/ or w/out operator/rider pedaling	Pedal-assist only Electric motor only engages while operator/rider is pedaling	A self-propelled vehicle, typically with two wheels, that is powered by an electric motor
Allowed on sidewalks	Prohibited from operating on sidewalks in business districts and as signed	Prohibited from operating on sidewalks in business districts and as signed	Prohibited from operating on sidewalks	Prohibited from operating on sidewalks
Max Motor Assisted Speed (MPH)	20MPH	20MPH	28MPH	15MPH
Helmet Required	Required for operators/riders under 18 years old	Required for operators/riders under 18 years old	Required for all ages	Under 18 years old must wear a helmet
Minimum Age to Operate	12years old	12years old	16 years old	Driver's License/Learner's Permit required

Let's Ride Safe, Chula Vista

www.chulavistaca.gov/ebikes

➡ Refer to Chula Vista Municipal Code 10.73



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While California State Law provides regulations for micromobility vehicles, the City of Chula Vista is introducing local updates to improve safety for riders and pedestrians, while continuing to encourage recreation and active transportation.

WHAT HAS CHANGED ?

Regulations	California State Law	Chula Vista New Ordinance
Minimum age to operate/ride Class 1 & 2 e-bikes	No restrictions	Must be at least 12 years old
Transporting passengers	No restrictions	Must be at least 18 years old
Sidewalk operations for Class 1 & 2 e-bikes	Allowed	Prohibited in business districts & as signed
Sidewalk operations for Class 3 e-bike	Allowed	Prohibited

WHAT IS NOT CHANGING ?

Existing California State Law Regulations – Remaining in Effect in Chula Vista

ADA exemptions continue to apply.

Motorized scooters may not be used to transport passengers or operated on sidewalks.

Helmets are required for riders under 18 on Class 1 and Class 2 e-bikes.

Helmets are required for all riders on Class 3 e-bikes.

IMPORTANT DATES

July - December 2, 2025	Education campaign
September 4, 2025	Chula Vista Electric Micromobility Vehicle Ordinance takes effect
December 3, 2025	Enforcement begins

Let's Ride Safe, Chula Vista

www.chulavistaca.gov/ebikes

➡➡➡ Refer to Chula Vista Municipal Code 10.73



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QUESTIONS?



Strengthening California Cities
through Advocacy and Education

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