



Electric-assist bicycle use on multi-use paths

**City Council
Public Hearing
November 18, 2014**



E-bike Pilot Project

- > E-bike pilot is Living Lab phase I project
- > In place since Feb 2014
- > Authorized by Ordinance 7491



Ordinance 7491

- > Excludes e-bikes from definition of a motor vehicle
- > Adds section 7-5-26
 - Enable City manager rulemaking authority
- > Establishes a sunset date of Dec. 31, 2014



E-Bike Pilot Study

> Evaluation

- Includes e-bikes and non-motorized bicyclists
- Evaluated speed, volume, and gender
- Interactions between multiuse path users
- Public input and feedback

> Observational study details

- 7 hours of field observation
 - Weekday and weekend observations
- 4 locations
 - Two locations along Boulder Creek Path
 - Broadway Boogie
 - South Boulder Creek Trail
- Confidence level based on sample size: 95%



Observational study

Key Findings

- > Less than 1% of all cyclists were riding e-bikes
- > 16 mph is the 85th percentile speed
- > Minimal “conflicts” between trail users

By the numbers

- > 4 locations
- > 7 hours
- > Weekday and weekend
- > Over 1,000 bicycles
- > Over 500 pedestrians

Etiquette campaign

- > Over 330 pledges
- > Online blog
- > Weekly surveys
- > Ambassador appearances



THE
way
OF THE
path

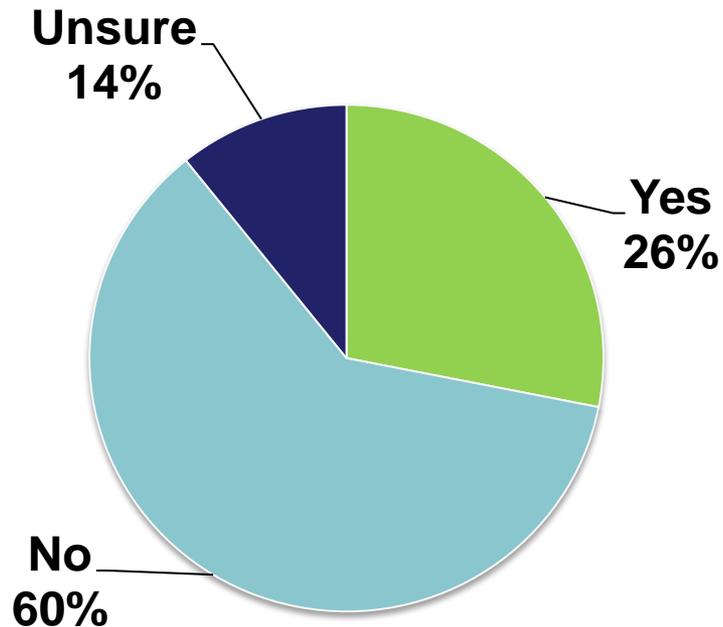


Know the rules. Accept your responsibilities. **Be part of The Boulder Way to GO.**

Intercept Survey responses

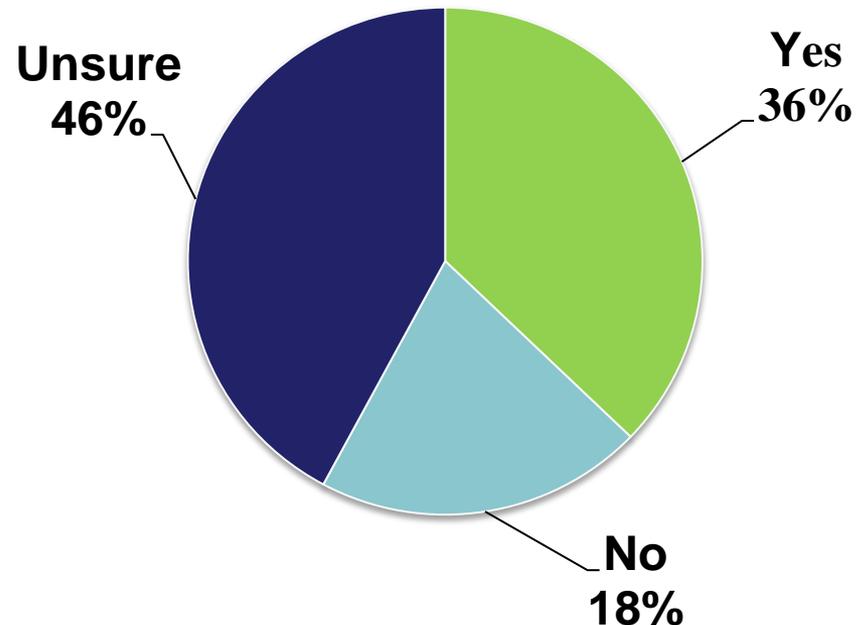
Have you encountered an e-bike on multi-use paths?

Yes: 34 • No: 74 • Unsure: 13



Do you support e-bike use on multi-use paths?

Yes: 45 • No: 25 • Unsure: 51



Transportation Advisory Board

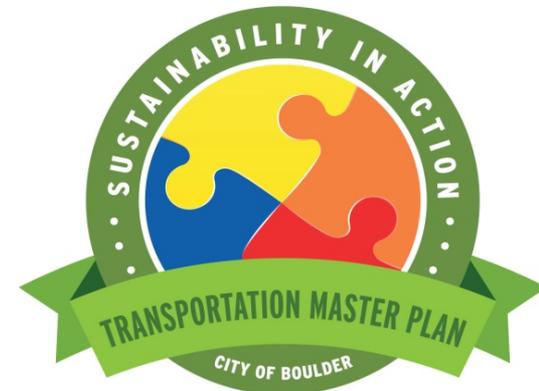
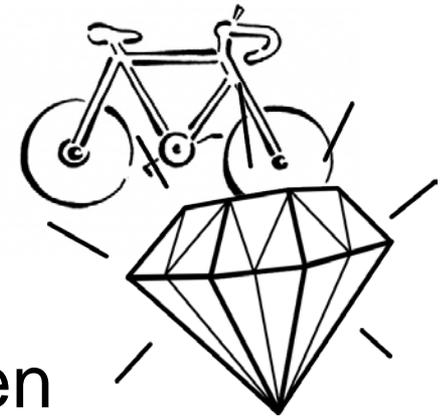
- > Unanimous recommendation to City Council to remove sunset date to Ordinance 7491
 - > Expressed desire to continue monitoring
-

First Reading Questions

- 1. How is electric-assisted bicycle use on open space lands being addressed?*
- 2. What control mechanisms are permissible?*
- 3. Should we do additional outreach and education on the operation of electric-assisted bicycles?*

TMP objectives for biking

- Bicycle Mode Share of more than 15%
- Bicycle Friendly Community in support of our modal goals
- Attract interested but concerned cyclists
- Increase trips by older adults, women and families with children



Next Steps

- > **Dec. 18:** New e-bikes ordinance enacted
- > Continue Way of the Path Campaign
- > Outreach on e-bikes benefits and use
- > On-going monitoring

Council Consideration

Adopt ordinance to remove sunset date to Ordinance 7491

- > E-bike use would be allowed on hard surface multi-use paths
- > Continue to be prohibited:
 - OSMP trails and sidewalks, except those designated as multi-use paths



**Additional Slides
for Q & A, if needed**

E-Bike Pilot Study - Locations



Boulder Creek (near BHS)

Boulder Creek (near SCP)

Broadway Boogie (near NOAA)

S. Boulder Creek (near Bobolink Trailhead)

Intercept Survey Locations



**Elmers Two Mile
at Goose Creek**

**Boulder Creek Path at
Boulder HS Underpass**

Arapahoe Rd.

**Arapahoe Path
East of 48th St.**

Baseline Rd.

**S Boulder Creek
South of Baseline Rd.**

Foothills Rd.



E-Bike Pilot Study - Locations

- > Boulder Creek Trail (near Boulder High School)
 - Thursday 7:39-9AM
 - Saturday 11AM-12PM
- > Boulder Creek Trail (near Scott Carpenter Park)
 - Thursday 4:30-5:30PM
 - Sunday 8:20-9:50AM
- > South Boulder Creek Trail (near Bobolink Trailhead)
 - Saturday 9-10AM
- > Broadway Boogie (near NOAA)
 - Monday 7:30-9AM

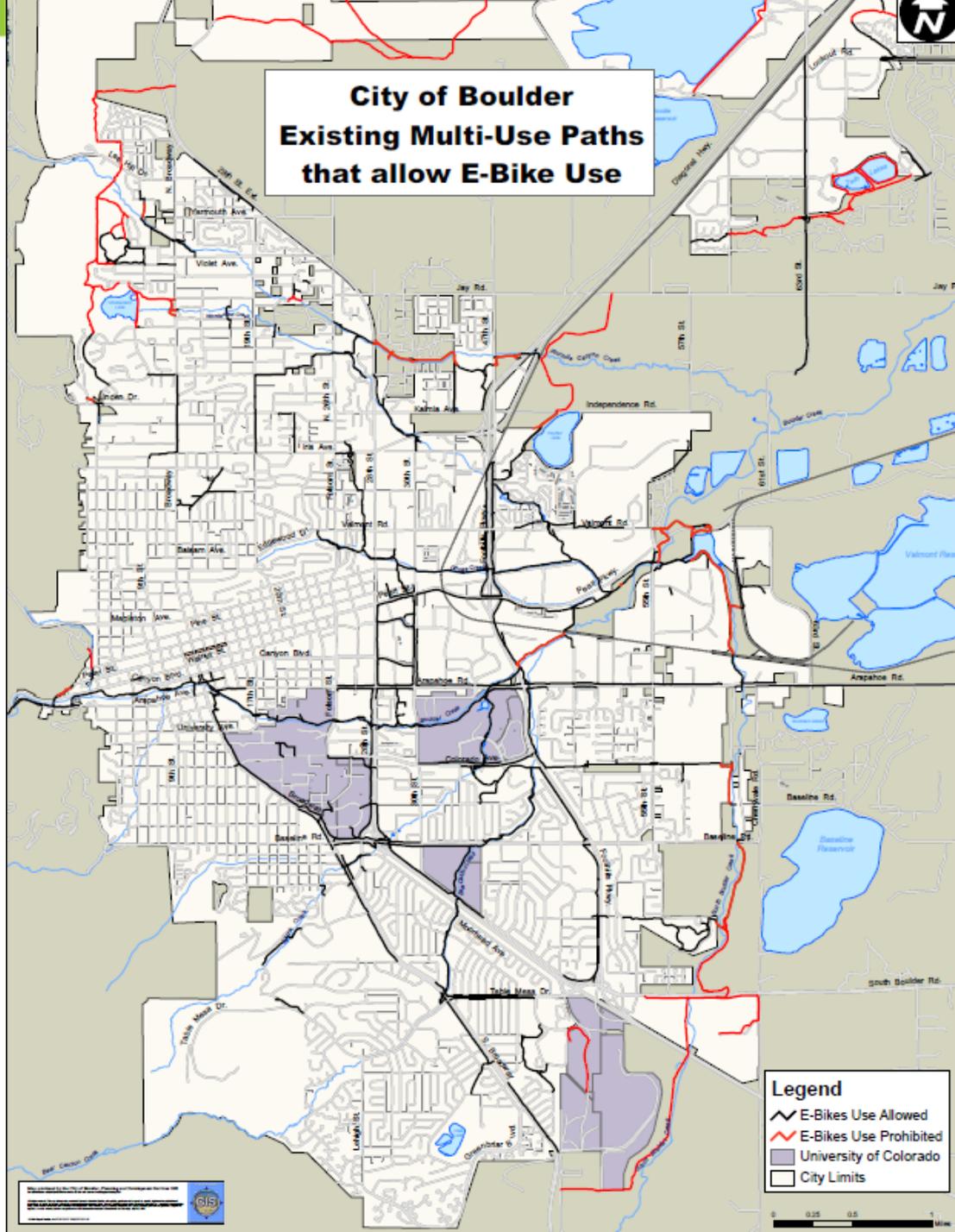
Colorado State Law definition of an e-bike

Colorado State Law* CRS 42-1-102 (28.5)

- > "Electrical assisted bicycle" means a vehicle having two tandem wheels or two parallel wheels and one forward wheel, fully operable pedals, an electric motor not exceeding seven hundred fifty watts of power, and a top motor-powered speed of twenty miles per hour.

* Denver and Fort Collins use this definition

City of Boulder Existing Multi-Use Paths that allow E-Bike Use



- Legend**
- E-Bikes Use Allowed
 - E-Bikes Use Prohibited
 - University of Colorado
 - City Limits

How Much Faster Are E-bikes?

> Speeds of bikes

Facility	Mean (mph)	Max (mph)	Min (mph)
Bike path	12.6	24.4	2.7
Bicycle lane	15.5	25.4	2.5
Sidewalk	11.5	18.7	2.1
No facility	11.8	22.9	5.0

Opiela et al ., 1980

	Mean (mph)	85 th Pert.
E-bikes	8.3	12.4
Conventional bikes	6.5	10.6

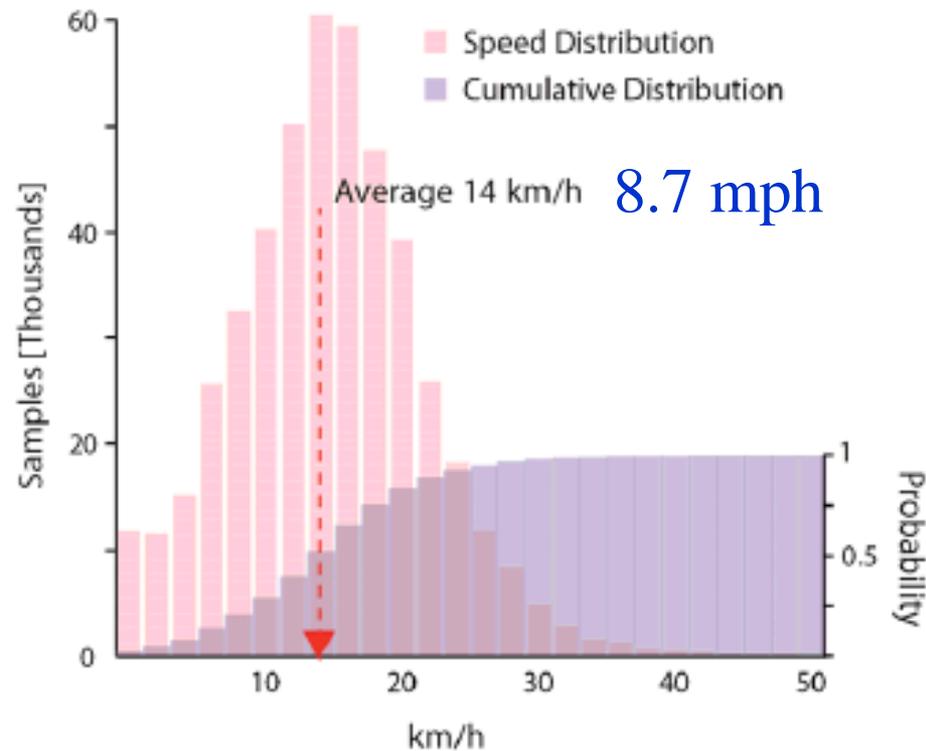
Langford & Cherry 2013

> AASHTO 2012 design criteria – bike facilities

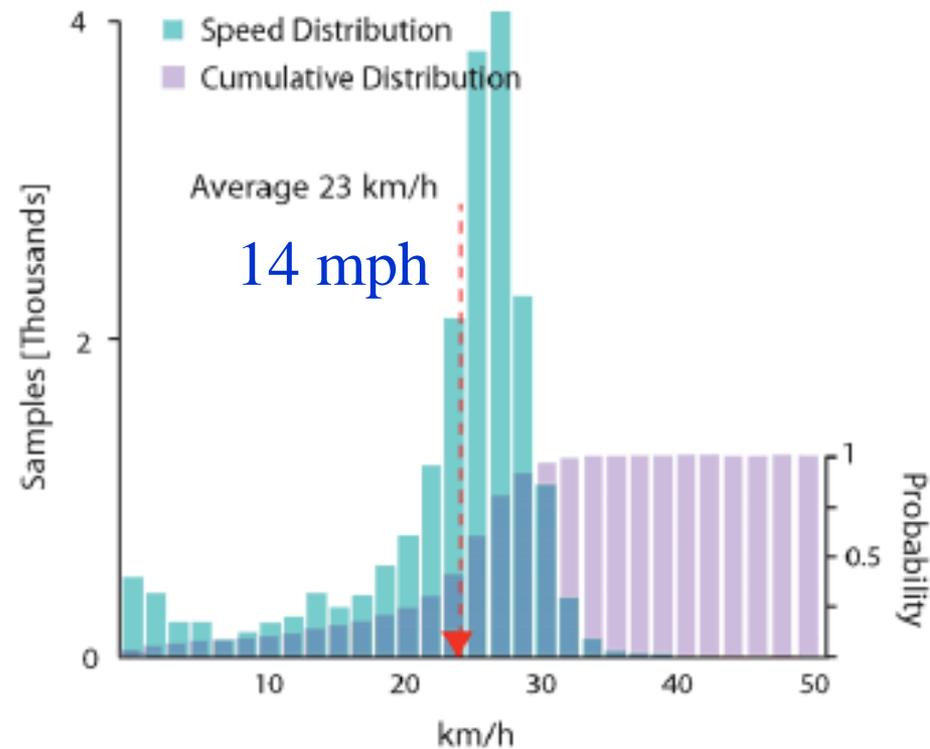
- 8-15 mph pave level terrain; 20-30 mph downhill; 5-12 uphill; 15 mph avg. operational speed

A Naturalistic Cycling Study in Sweden

Traditional Bicycles

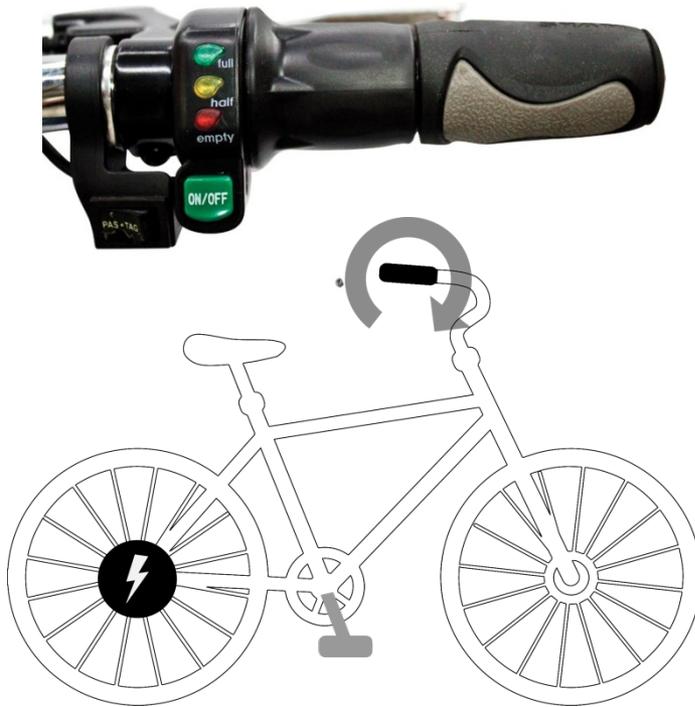


Electrical Bicycles



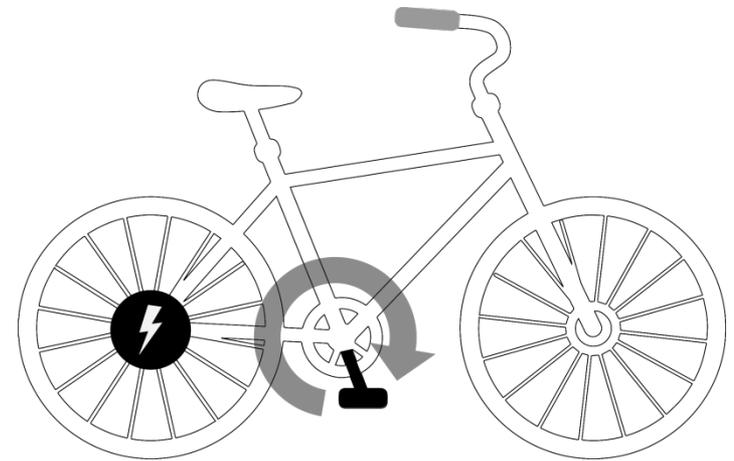
Different types of the e-bikes

Throttle



Powered bicycle (PB)

Pedelec



Powered-assisted bicycle (PAB)

E-Bike Pilot Study - Findings

- > Less than 1% of all cyclists were riding e-bikes
 - Only seen on Boulder Creek Path (weekend)
 - Wearing casual clothing and not riding in a group
 - Recorded speed was below 15MPH speed limit



Local Retailer information

- > Less than 100 e-bikes have sold in 2014
- > Typical buyer is
 - 40's ~ 50's
 - Back into exercise
- > Not increase in sales when pilot project began
- > E-bike sales increasing each year



E-Bike Pilot Study - Locations

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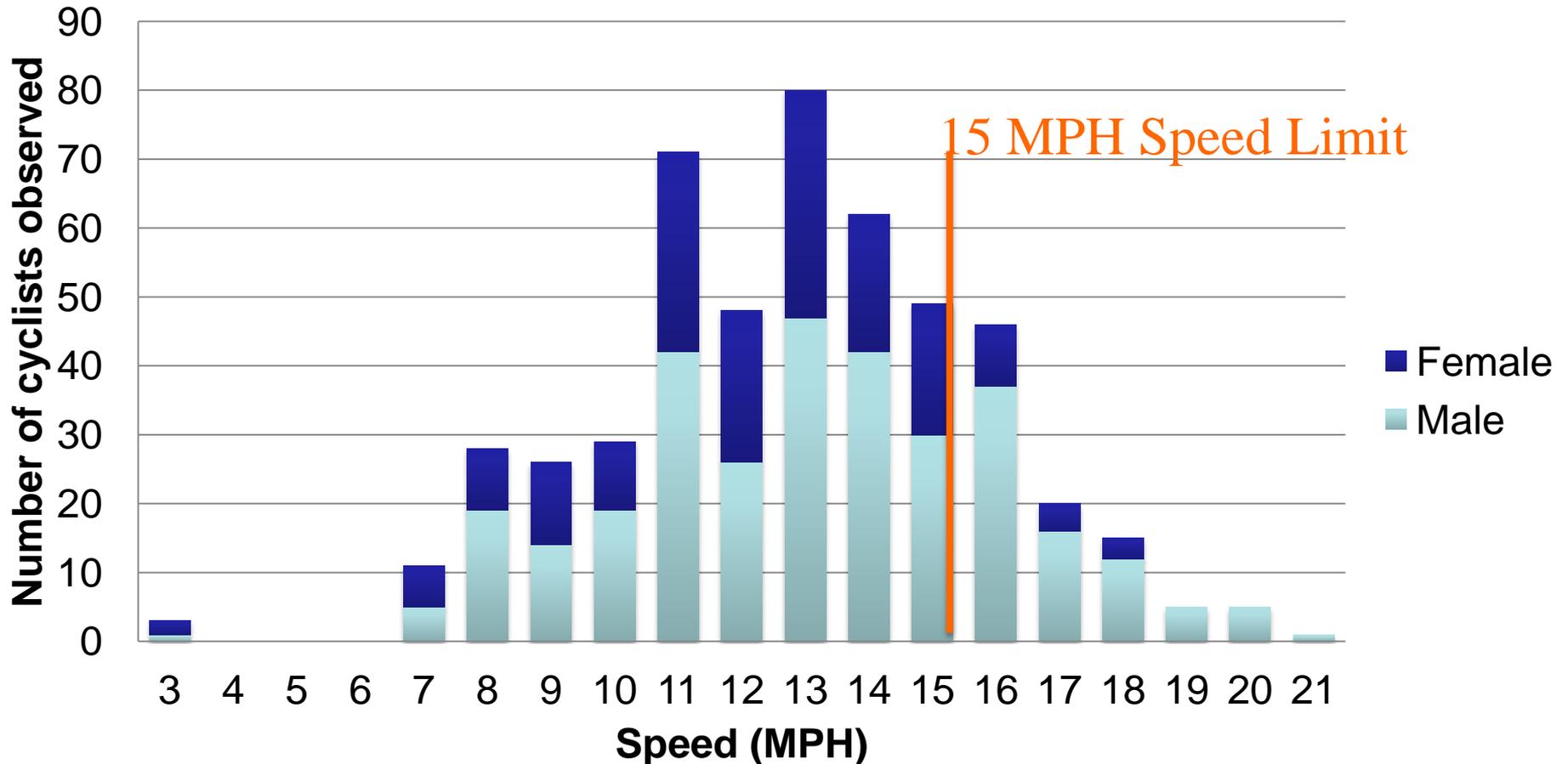
Observations: Boulder creek Path (at Boulder High School)

- > 500 cyclists observed
 - 64% male cyclists
 - 36% female cyclists
- > 16 MPH 85th Percentile Speed
- > 82% of cyclists were traveling at or below the 15 MPH speed limit



Observations: Boulder creek Path (at Boulder High School)

Saturday 11AM-12PM, Thursday 7:30-9AM



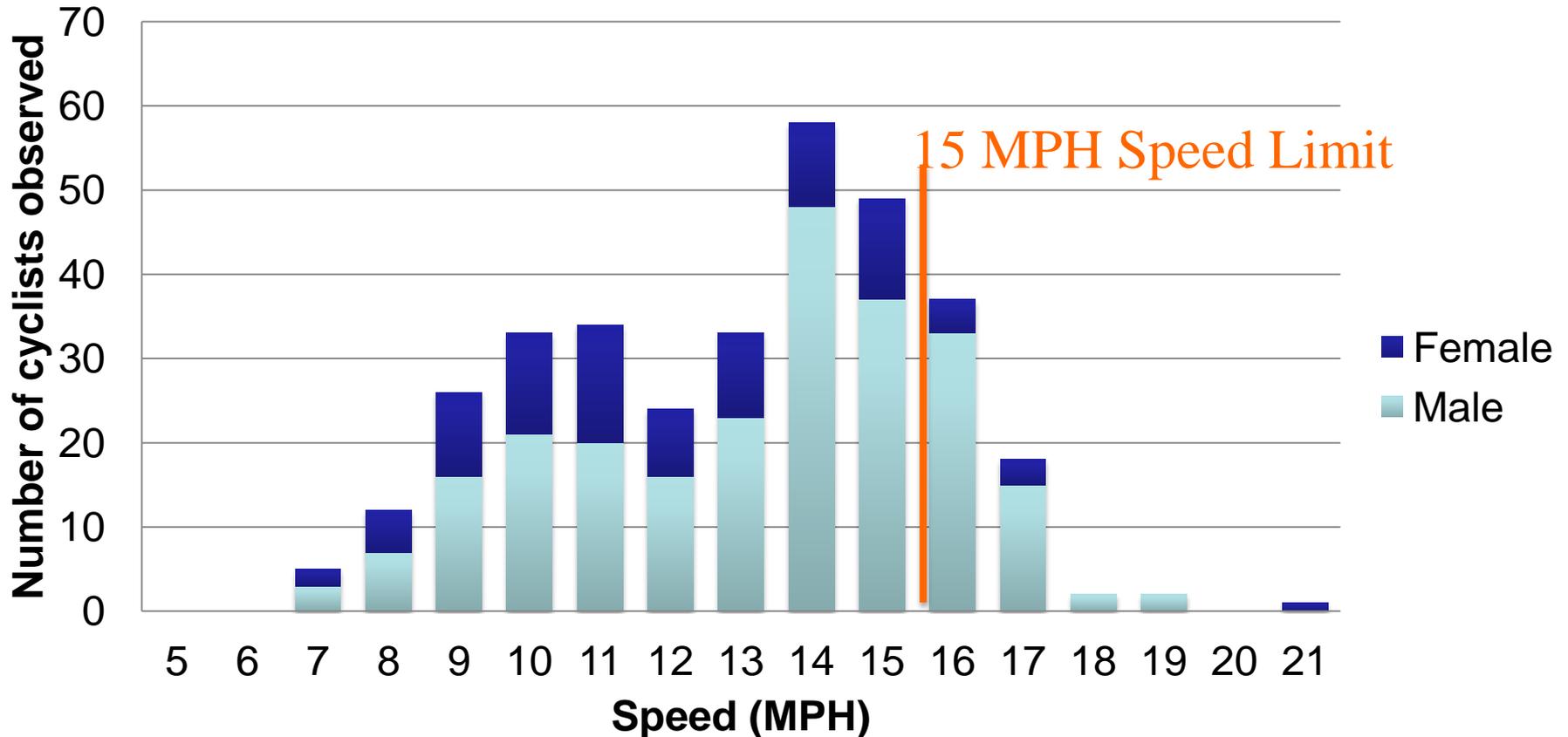
Observations: Boulder creek Path (at Scott Carpenter Park)

- > 335 cyclists observed
 - 73% male cyclists
 - 27% female cyclists
- > 16 MPH 85th Percentile Speed
- > 64% of cyclists were traveling at or below the 15 MPH speed limit



Observations: Boulder creek Path (at Scott Carpenter Park)

Thursday 4:30-5:30PM, Sunday 8:20-9:50AM



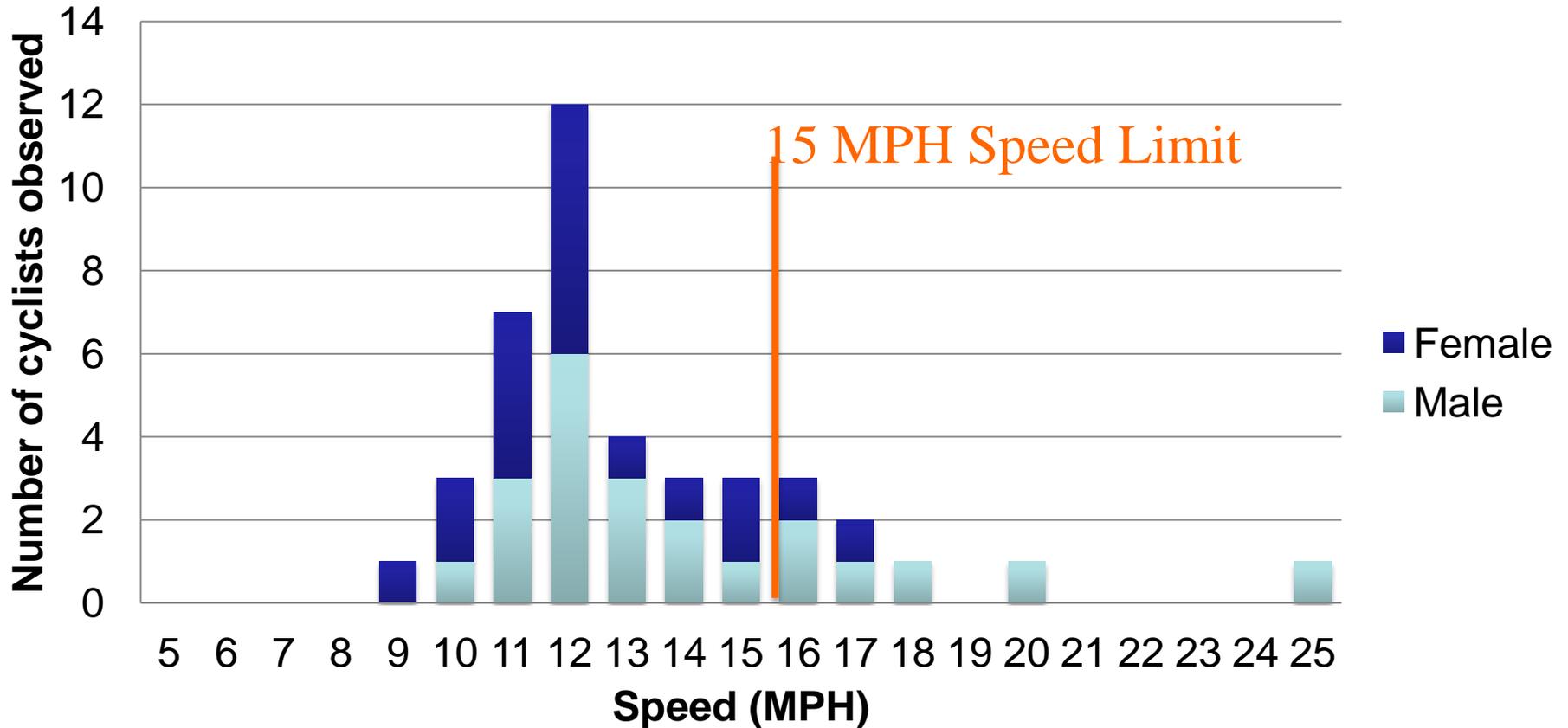
Observations: S. Boulder creek Path (near Bobo Link Trailhead)

- > 50 cyclists observed
 - 54% male cyclists
 - 46% female cyclists
- > 17 MPH 85th Percentile Speed
- > 80% of cyclists were traveling at or below the 15 MPH speed limit



Observations: S. Boulder creek Path (near Bobo Link Trailhead)

Saturday 9-10AM



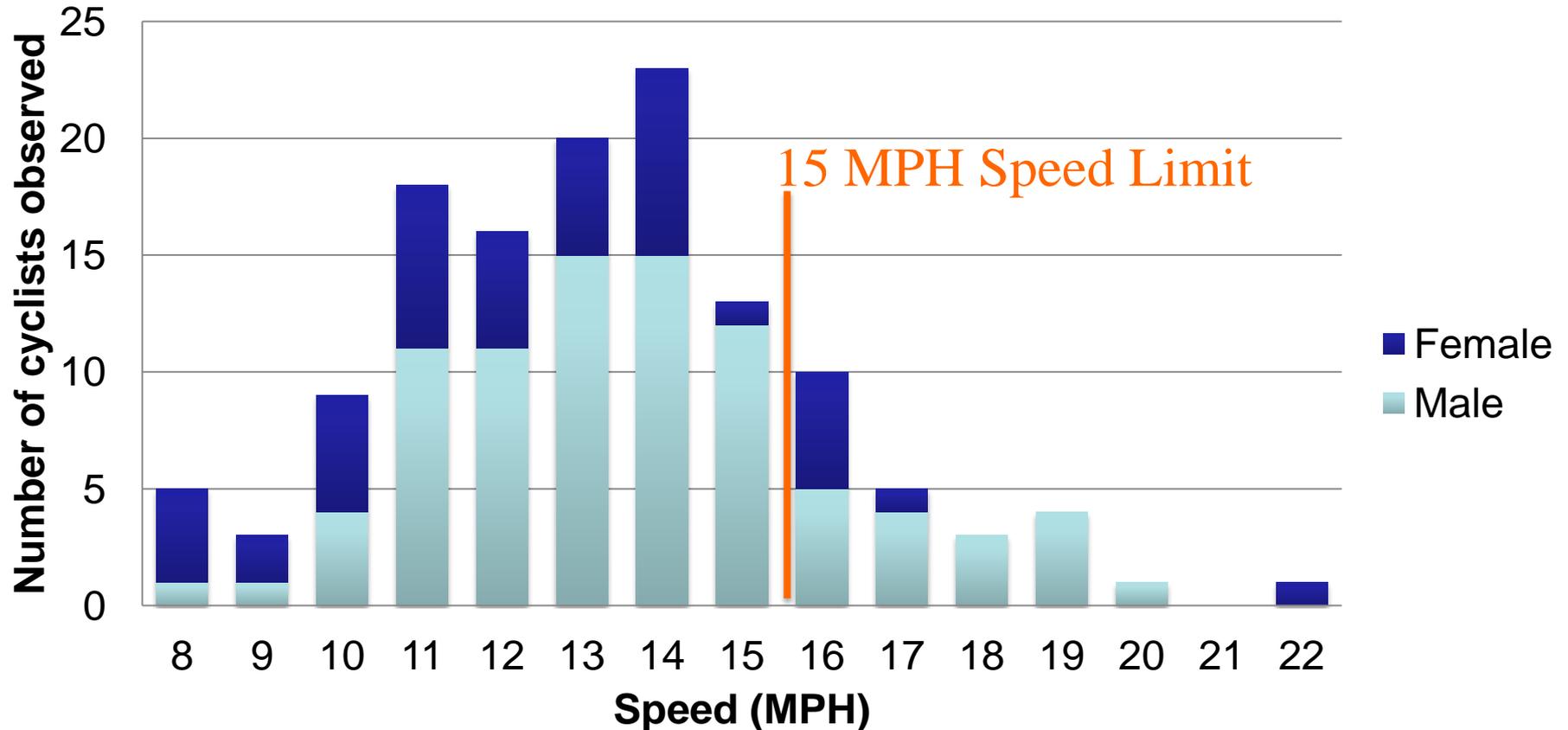
Observations: Broadway Path (near Rayleigh Road/NOAA entrance)

- > 130 cyclists observed
 - 66% male cyclists
 - 34% female cyclists
- > 16 MPH 85th Percentile Speed
- > 82% of cyclists were traveling at or below 15MPH speed limit



Observations: Broadway Path (near Rayleigh Road/NOAA entrance)

Monday 7:30-9AM

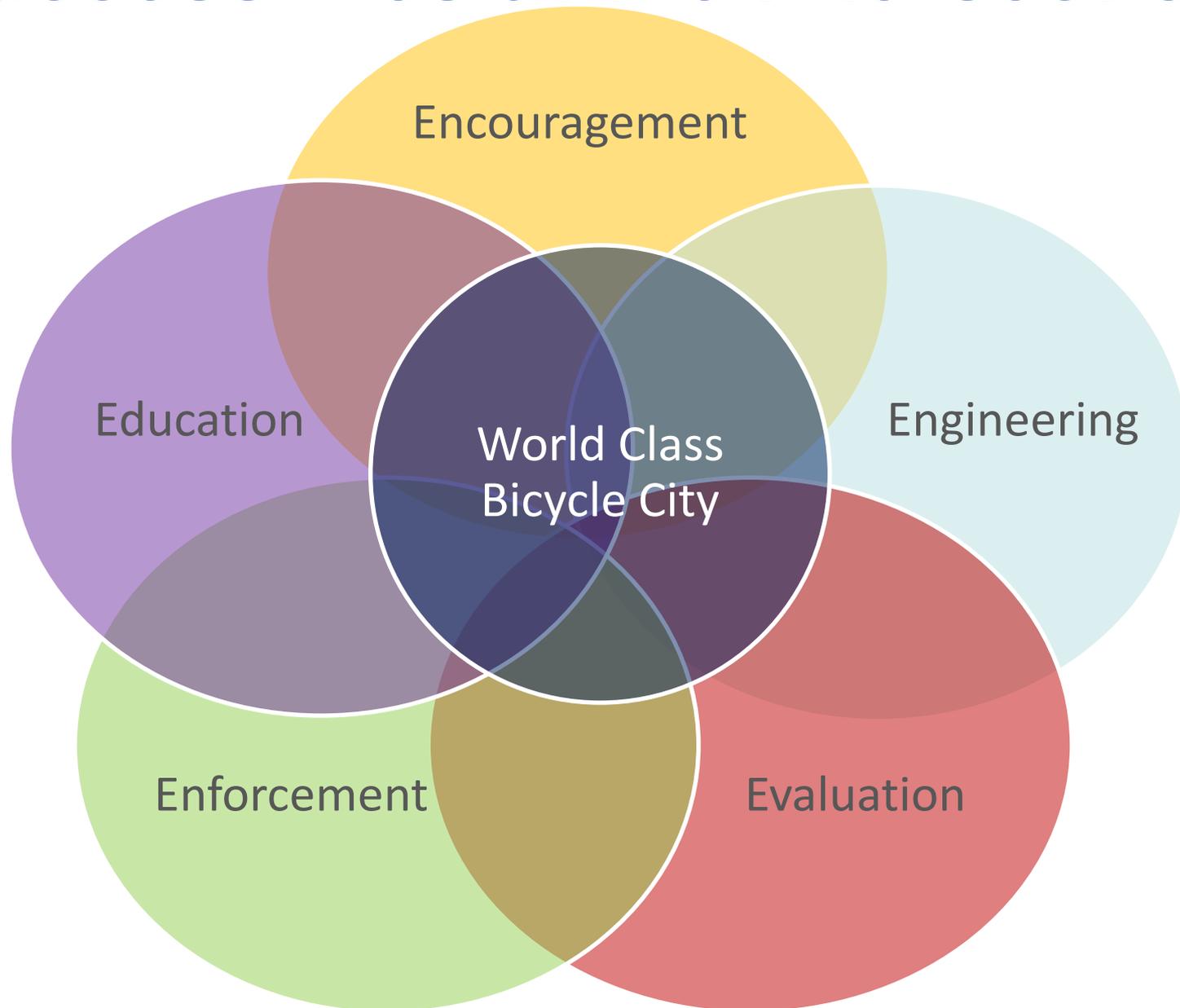


What is an e-bike?

- > A **bicycle** with an integrated motor.
- > Helps propel a rider up to a 20 mph limit.
- > 250 ~ 1,000 Watt motor capacity



Success Lies at the Intersection



Key Findings from Public Input

Against testing E-Bike

- Paths are too congested
- Speed and safety
- Behavior and Enforcement

Support testing E-Bike

- Helps aging generations stay active and healthy
- Makes longer distance commutes viable by bike
- Economic & Less Polluting alternative to automobiles

-
- Separation between Pedestrians and Bicyclists
 - Support amending definition of e-bike

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- > A **bicycle** with an integrated motor.
- > Helps propel a rider up to a 20 mph limit.
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E-bikes regulations if current ordinance sunsets

Allowed

- > In on-street bicycle lanes
- > On roadways

Prohibited

- > On any multi-use paths
 - Hard-surface
 - Soft-surface (crusher fine)
- > On any single track trails
- > On any sidewalk

The Five Es

Engineering. Evaluation. Enforcement. Encouragement. Education

Living Laboratory

Evaluation methods for e-bike pilot

- Modal traffic volume, vehicle speeds, and collision experience
- Field observations
- Intercept surveys
- Bike and Walk Audits / Focus Groups
- Community Feedback Panel / Inspire Boulder