

PRESENTATION

INTEGRATING **NEW/e-** **MOBILITY** ON YOUR TRAILS

Equity, Access, Safety, Policy and Design



Outline

- New/E- Mobility & Trails
- E-Bikes
- E-Bikes & Trails
- LSEVs/NEVs & Trails
- Discussion





What is New Mobility?

A blue wireframe profile of a human head, facing right, set against a background of circuitry and binary code. The wireframe is composed of a grid of lines that define the shape of the head, including the ear, nose, and jawline. The background is a dark blue with lighter blue circuit patterns and binary digits (0s and 1s) scattered throughout. In the top right corner, there is a large, stylized white letter 'D' with a blue outline.

PERSONAL MOBILITY OPTIONS



PERSON WALKING









WHEELCHAIR



BICYCLE

SPEED	3-4 ft/s (2-3 mph)	1-5 mph	10-12 mph
TRIP DISTANCE			
MAY ALSO INCLUDE	Joggers and runners	Power Chair or Motorized Wheelchair or Rollator	Tricycles, Cargo Bikes, Tag-alongs, Trailers, etc.
PARKING CONSIDERATIONS	None	None	Access to on-street corrals, racks in the furnishing zones
SHARED MOBILITY CONSIDERATIONS	None	None	Access to shared mobility docking stations (ex. Chicago Divvy or NYC CitiBike) or designated hubs and standard bicycle racks (ex. Portland BikeTown and Santa Monica Breeze)

PERSONAL MOBILITY OPTIONS

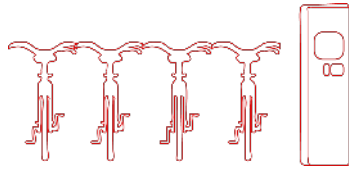
						
	PERSON WALKING	WHEELCHAIR	BICYCLE	E-BICYCLE	E-SCOOTER	SEATED SCOOTER
SPEED	3-4 ft/s (2-3 mph)	1-5 mph	10-12 mph	up to 20 mph	15 mph	
TRIP DISTANCE						
MAY ALSO INCLUDE	Joggers and runners	Power Chair or Motorized Wheelchair or Rollator	Tricycles, Cargo Bikes, Tag-alongs, Trailers, etc.	Class I, II, III; Electric Tricycles; Electric Cargo Bikes; and Pedalless E-bikes	Stand-up e-scooters, e-skateboards, hoverboards, balance boards	
PARKING CONSIDERATIONS	None	None	Access to on-street corrals, racks in the furnishing zones	Access to on-street corrals, racks in the furnishing zones	Access to on-street corrals, racks in the furnishing zones	
SHARED MOBILITY CONSIDERATIONS	None	None	Access to shared mobility docking stations (ex. Chicago Divvy or NYC CitiBike) or designated hubs and standard bicycle racks (ex. Portland BikeTown and Santa Monica Breeze)	Access to shared mobility docking stations (ex. Summit Bike Share in Park City, UT) or designated lock-to racks (ex. JUMP) or designated micromobility parking zones (ex. Wheels)	Undesignated parking (in furnishing zone or similar area), scooter docking stations, or designated parking zones	Undesignated parking (in furnishing zone or similar area) or designated micromobility parking zones

OFTEN AVAILABLE AS SHARED MOBILITY

New Mobility Forms



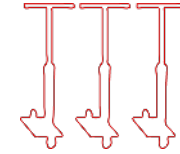
e-bikes



bikesharing



e-scooters



scooter sharing



golf carts



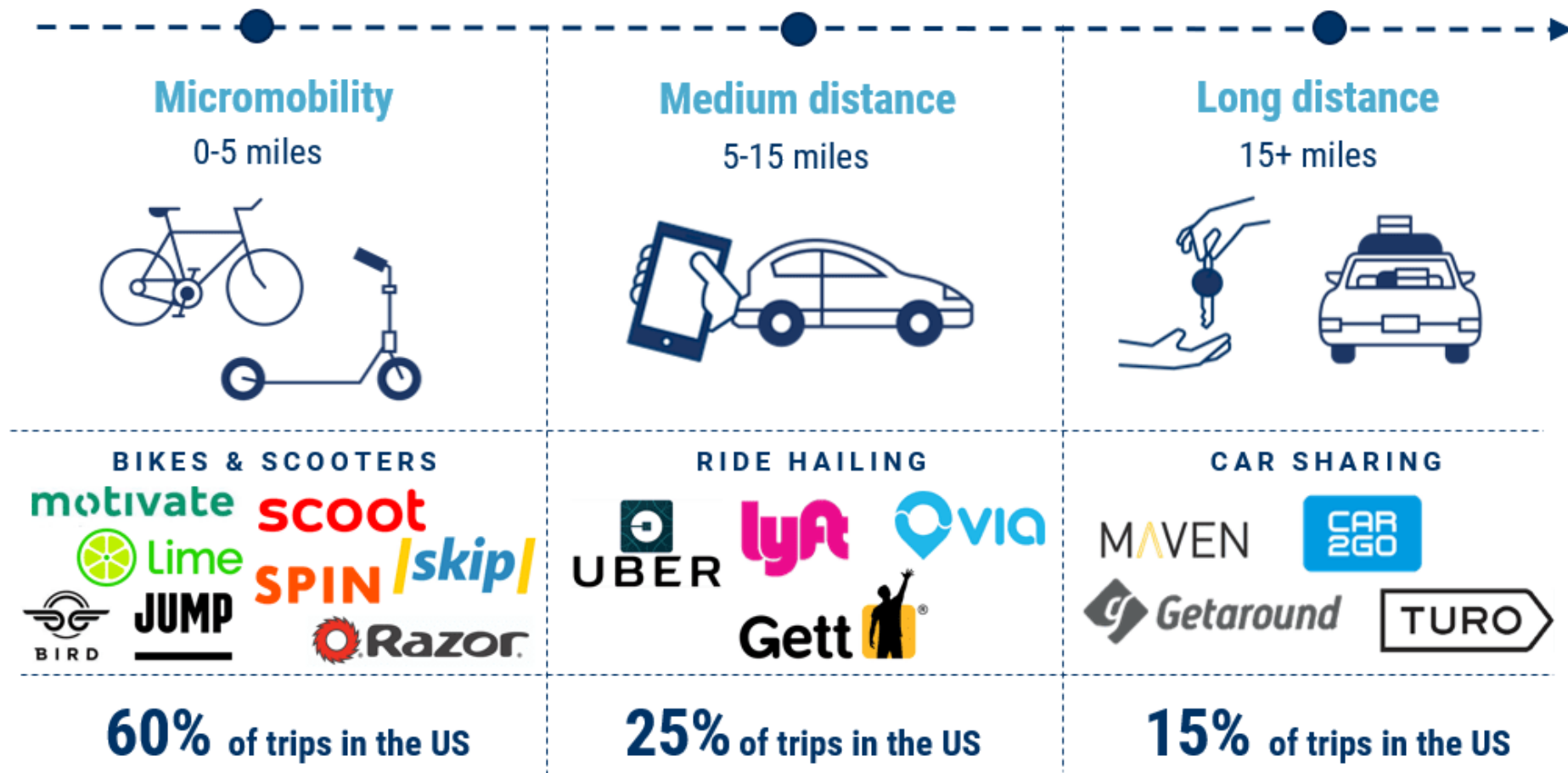
**neighborhood
electric vehicles
(NEVs)**



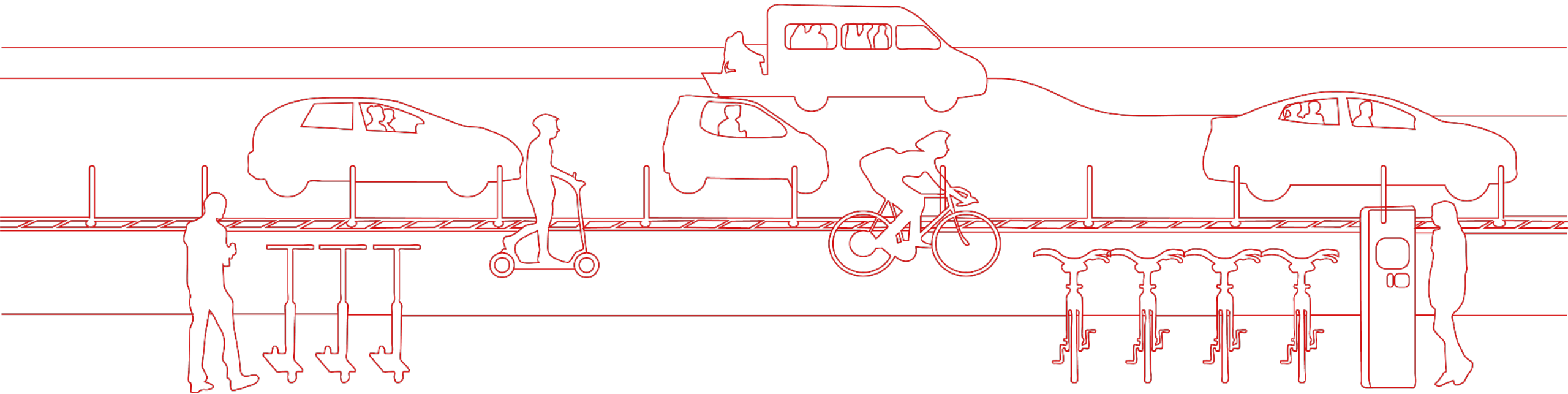
**low speed
autonomous
shuttles**

DISRUPTING THE CAR

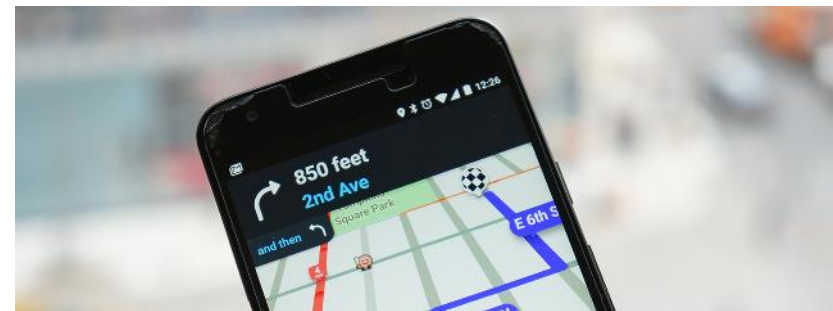
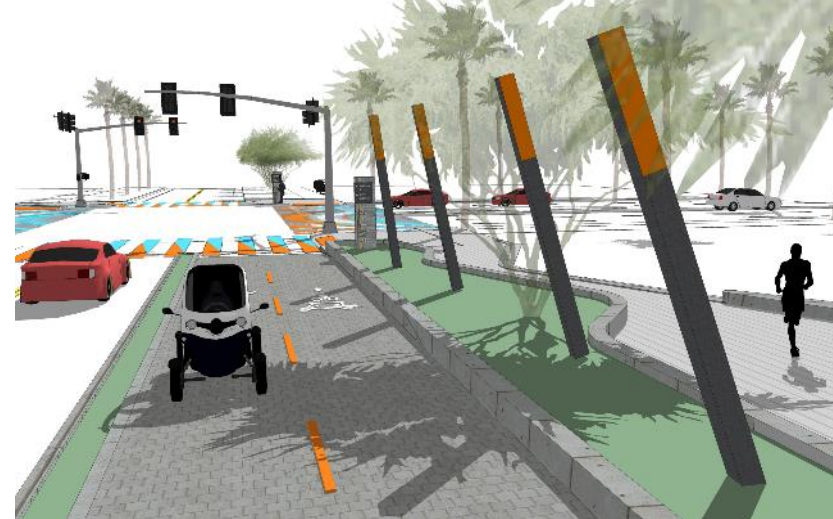
Alternatives to car ownership by trip length



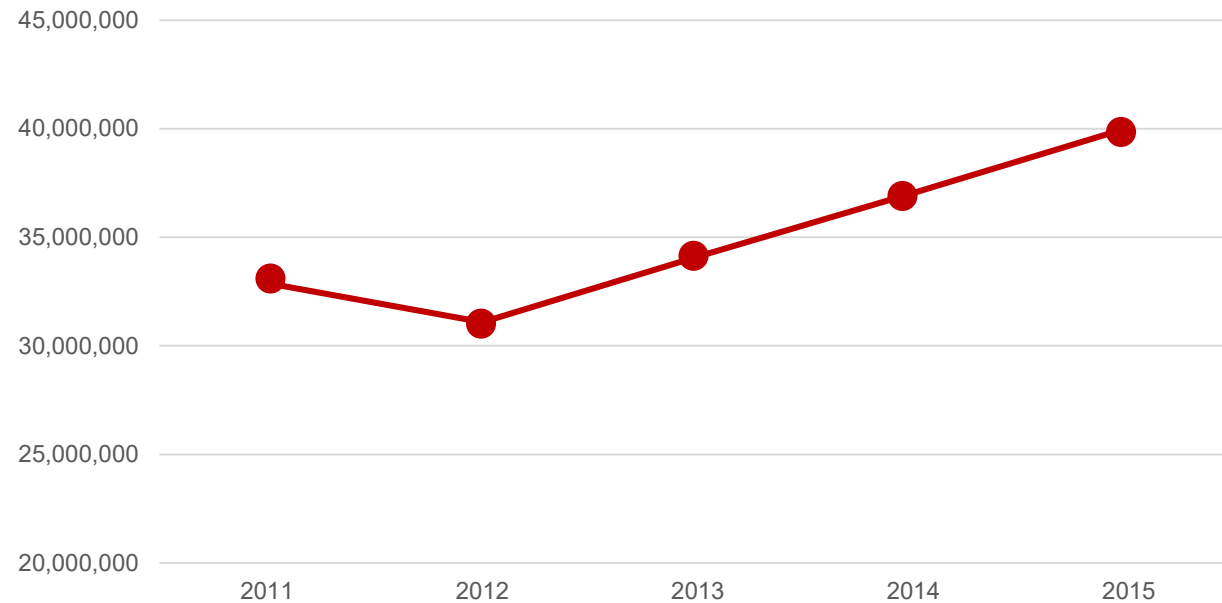
Expanded Options



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Growing Use



global e-bike sales increased 20% from 2011 to 2015

SOURCE: Fishman and Cherry, 2015

of **scooter sharing** schemes have **doubled** every year from 2012 to 2017 globally

SOURCE: INNOZ, 2017

Ridesourcing revenue expected to **grow 75%** from 2018 to 2022

SOURCE: Statista, 2018

Trip Replacement



e-bikes

25%

auto

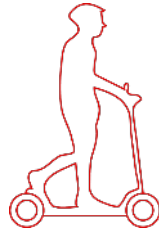
60%

transit

7%

bike

SOURCE: Cherry et al, 2016

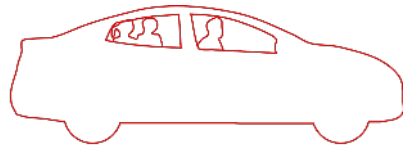


e-scooters/NEV

39%

auto

SOURCE: Walker, Curbed



ridesourcing/hailing

25%

transit

+15%

more auto trips

SOURCE: NCST, 2018



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Trail Disruption

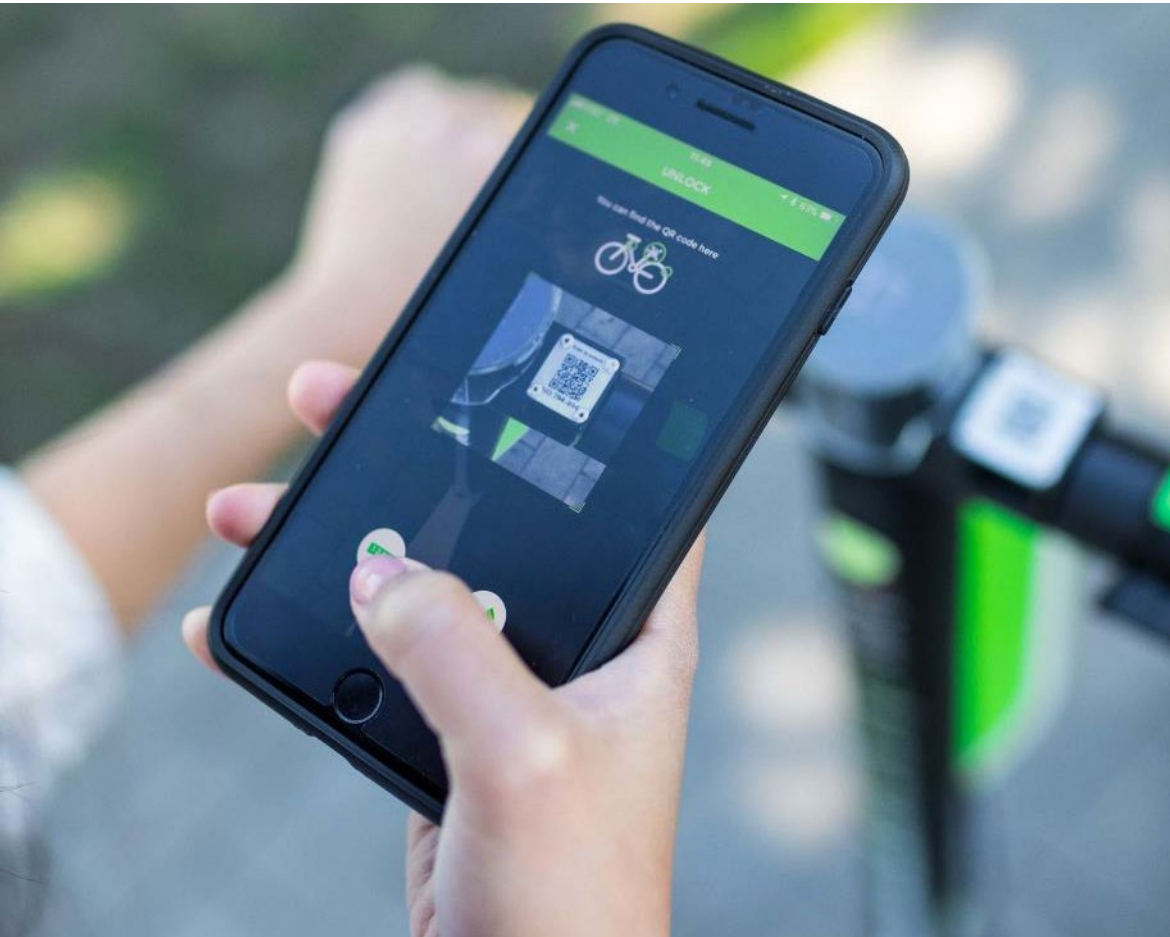
New Trail Users



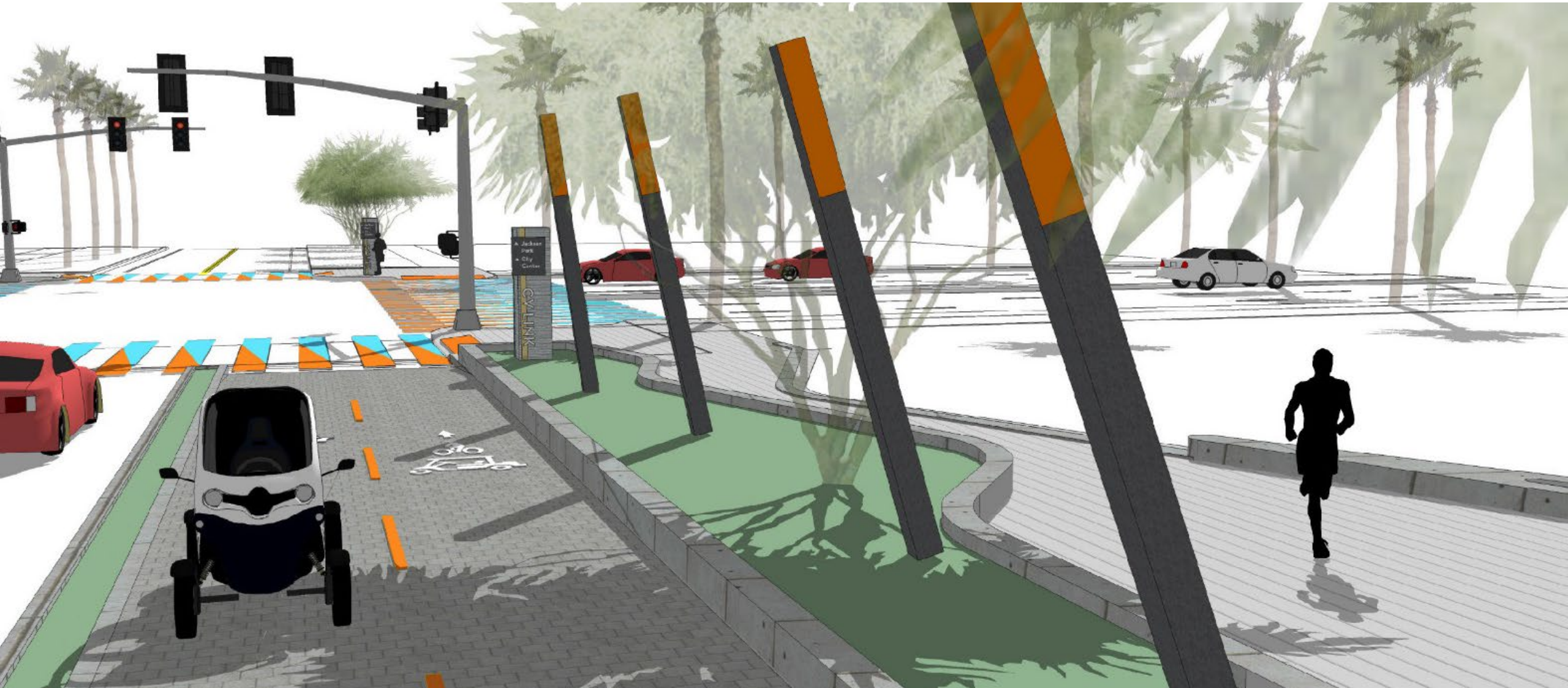
Competing Needs



New Mobility Choices



New Trail Design + Policies





Trends + Responses

Trends

Micromobility

Low Speed Electric Vehicles

Low Speed Autonomous Shuttles

Interactive Wayfinding

Equity Concerns

ADA Accessibility

Responses

Safe Design

Reducing Conflict Points

Speed Designated Lanes

Electric Infrastructure

Flexible Design

Mobility Hubs

Geofencing

Beacons

Design

- Speed Designated Lanes
- Intersection Design
- Electric Charging
- Flexible Design/Mobility Hubs



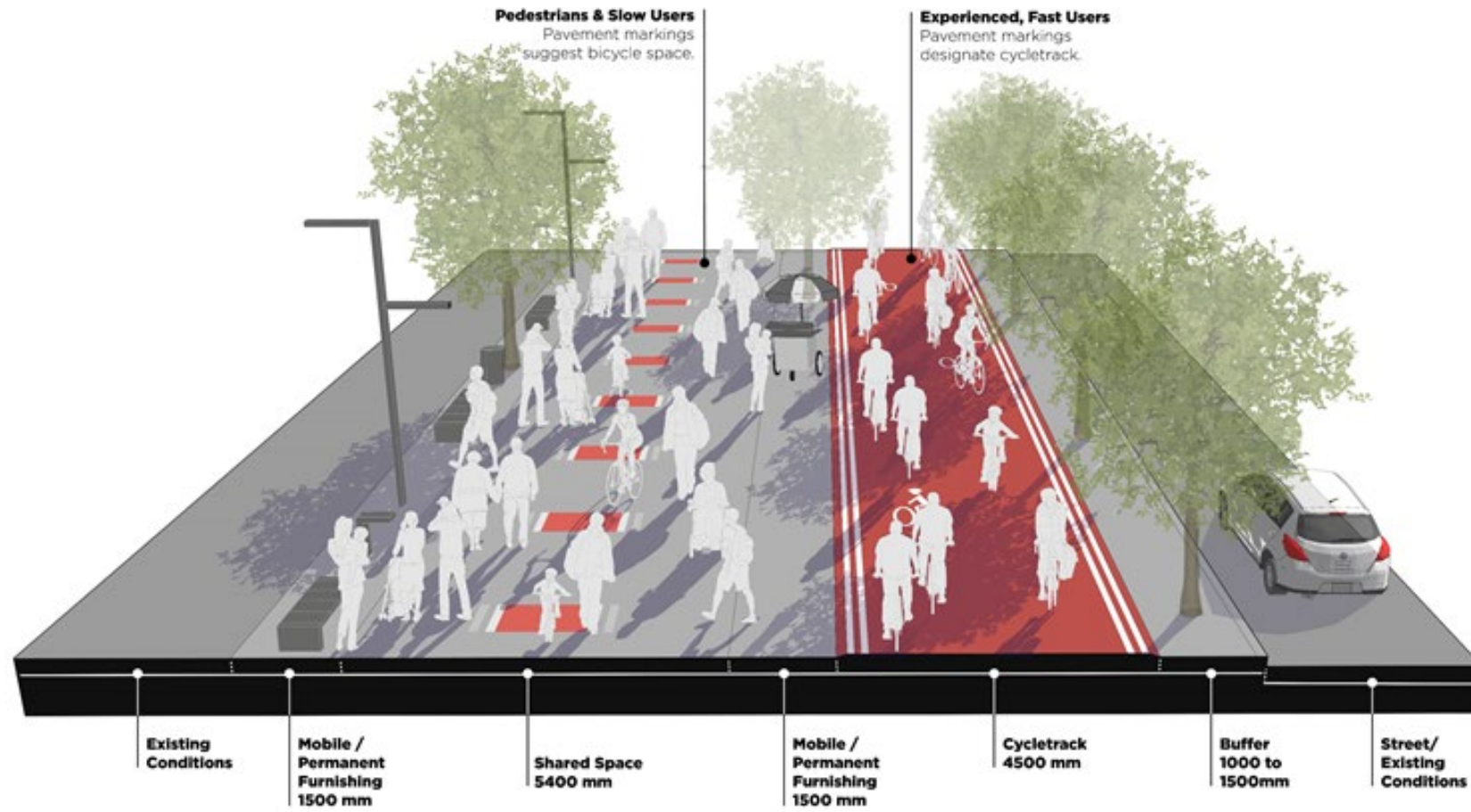
Geofencing

KEY

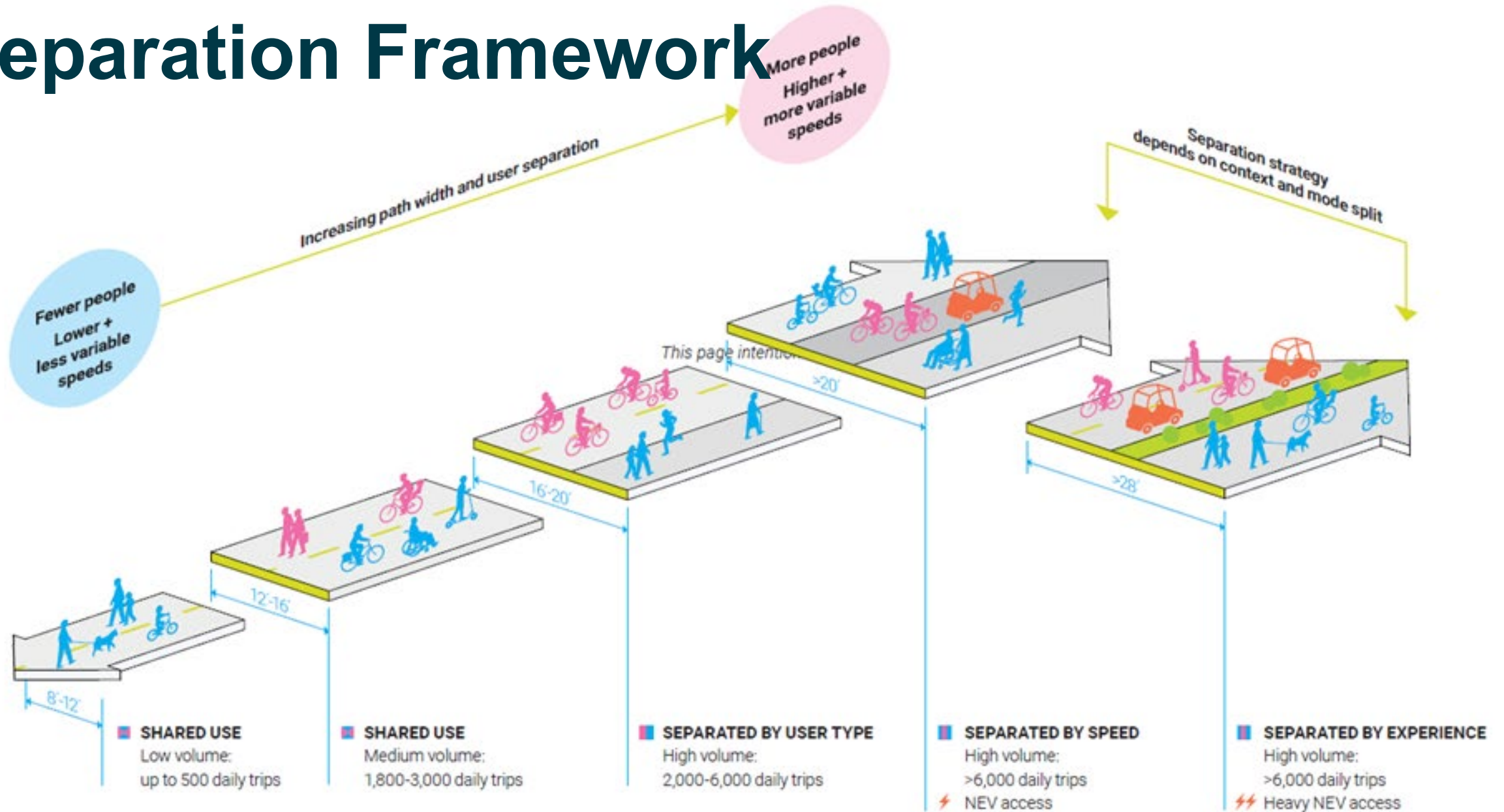
- City of Austin - 15 mph
- UT Campus - 15 mph
- Under review - proposed 8 mph
- Inner Campus - 8 mph



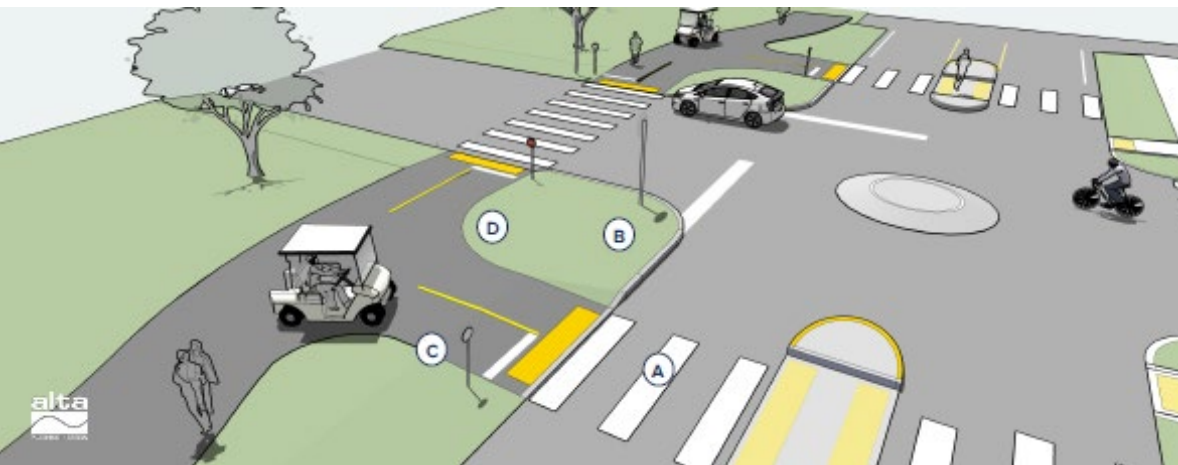
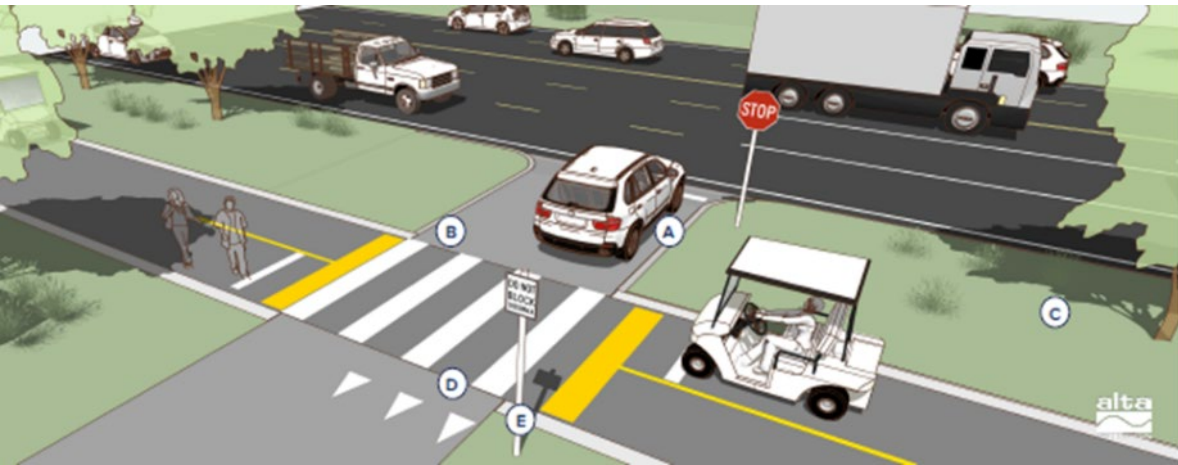
Speed Designated Lanes



Separation Framework



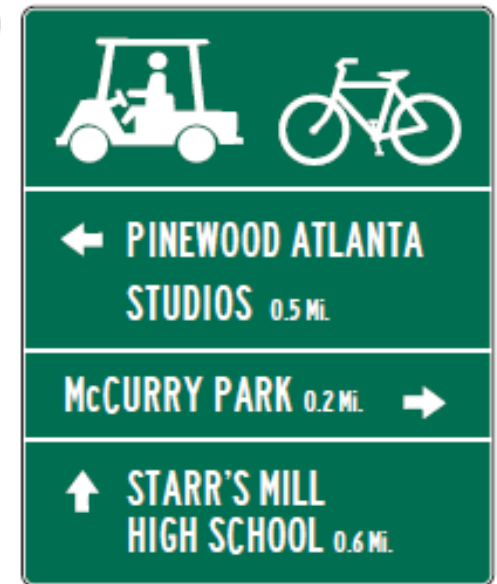
Trail & Intersection Design Guidelines



A



C

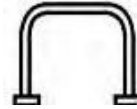


B

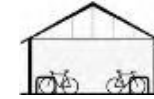


Trail Heads = Mobility Hubs

- New Mobility demands:
 - Storage and securing facilities
 - Electric charging
 - Wayfinding (real-time and navigation)
- Trail access points as key hubs



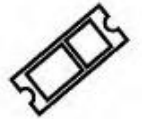
Short term bike parking



Long term bike parking



Bikeshare & scootershare parking



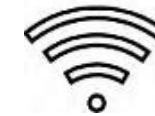
Transit ticket and integrated payment kiosks



Bus/shuttle stop



Freight loading/ unloading area



Wifi hub



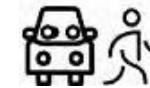
Ridesourcing loading/ unloading area



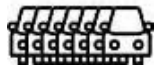
Electric vehicle charging (including bicycles & scooters)



Real time transit information & other shared mode information



Microtransit pick up & drop off area

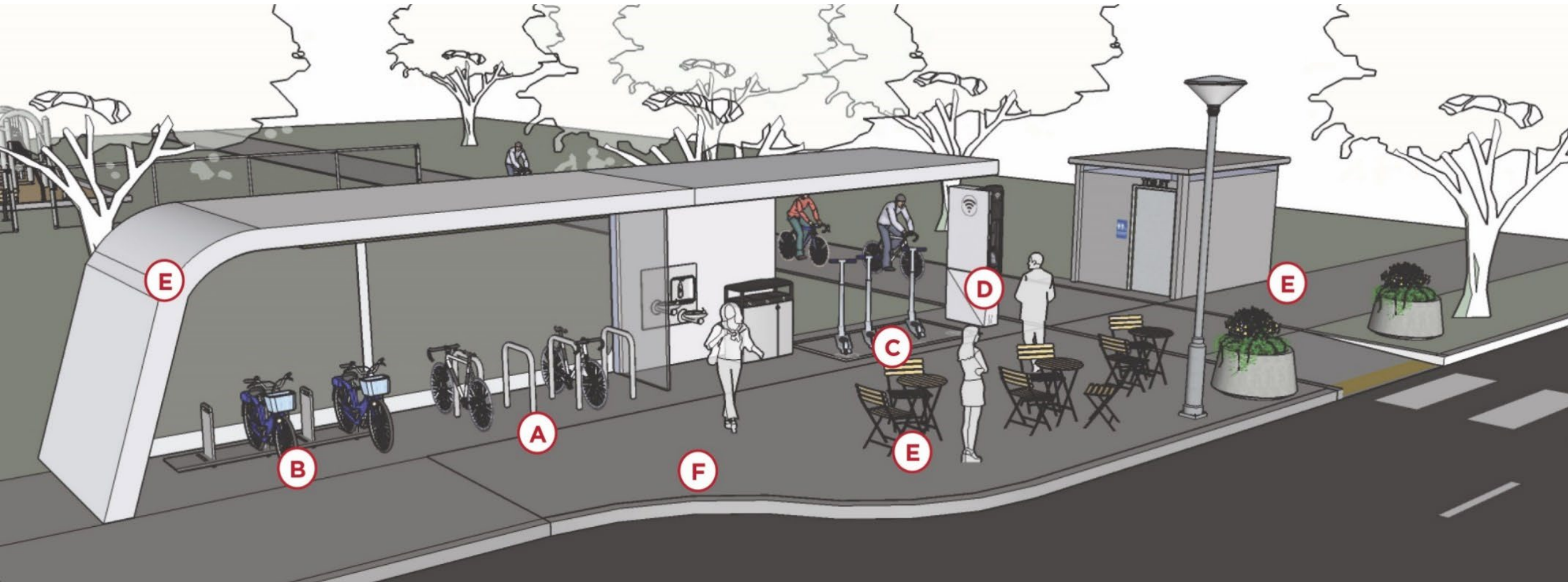


Carshare parking and access points



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Mobility Hubs



Electric Charging



CV/LINK

CONNECTING THE COACHELLA VALLEY

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Flexible + Innovative Design



Wayfinding & Securing



Policy Implications

- Park/Trail Access
- Speed Control Through Design Standards
- Speed Control through Geofencing
- Permit Process
- Program Size Limitations



No Silver Bullet





What's Next?

John Cock, VP/Principal, Alta Planning + Design

johncock@altaplanning.com



12th Annual NC Trail Forum

Joe Michel, owner

What is an eBike?

Electric Bicycles are defined by Three (3) Classes:

- **Class 1** - Pedal Assist Only up to 20 Mph
- **Class 2** - Pedal Assist up to 28 Mph, Throttle Option up to 20 Mph
- **Class 3** - Pedal Assist Only up to 28 Mph
Note: 22 States have adopted People For Bikes template law.

Categories of eBikes:

Urban/City, Off Road/eMTB, Cargo/Utility,
Compact/Folding

How are they being used?

- **Recreational** - All Ages, early adopters 55-70 year olds (baby boomers) - *Urban/Off Road/Trekking*
- **Transportation**
 - Replacing Car Errands
 - Kids to School - *Cargo/Utility Models*
 - Shopping - Grocery, Smaller items- *Cargo/Utility*
 - Meeting Friends - *Urban/City/Utility*
 - Daily Community to work - *Class 3 models*

How are they transforming bike riding?

- **Ride twice as far, twice as fast** with sustained uphill speeds. Greater distance achieved with assist.
- **Adjustable levels of assist** offer Exercise to Commuting range of physical exertion.
- Healthy, sustainable, zero emission transportation.
- Greenways, Trails, Paths and Protected Lanes will lead to a significant increase in eBike adoption.
- eBike Riders are advocates!

eBikes and Trail Use

- eBikes have evolved in **Europe** where **+30% are eBikes**.
- **1 in 10 Bicycles sold in U.S.** are eBikes, trending.
- eBike use means cars are used less for errands and commuting.
- eMountain Bikes adopted by IMBA, Competitions.
- National Parks approved access to certain bike trails.
- eBike Riders want more greenways, trails and lanes.
- Safer Riding will expand the use of Bikes and eBikes.

How to Plan, Design & Manage Trails for eBikes?

- North Carolina recognizes Class 1 eBikes but is likely to adopt the Three Class Template Law from People For Bikes. Federal law recognizes all three classes.
- Thoughts & Suggestions:
 - eBike Central can work with you to provide **eBikes for testing trails**.
 - Class 1 eBikes are designed to ride with traditional bicycles.
 - Class 3 or Commuting eBikes are designed to ride on the Street and Bike Lanes.
 - eBikes are transported via cars mainly on Hitch Mount Racks due to increase in weight.
 - **Signage** that eBikes are allowed.
 - **Promote** that eBikes are welcome and supported by cities, municipalities and trail managers in communications.
 - **eBikes need to be charged**. When possible have AC Outlets available, though most riders charge at home.
 - **More locking racks** near places of interest and stopping points. Work and Business locations as well.



Thank you!

eBikeCentral.net
joe@ebikecentral.net
Twitter: @ebike_central
facebook.com/ebikecentral
888 876 6473

E-Bikes and Trails

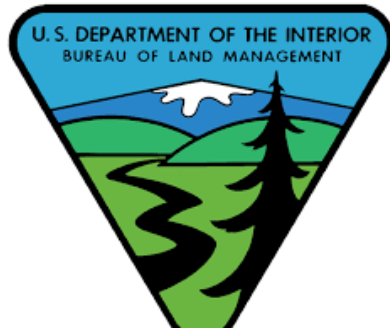
WILL WASHAM, BICYCLE PROGRAM COORDINATOR

CITY OF CHARLOTTE, WILLIAM.WASHAM@CI.CHARLOTTE.NC.US



How to classify?

Treat E -bikes as
regular bike or
regulate them
differently?



Federal level access

National Parks Service (Department of Interior)

- E-bikes generally allowed just as traditional bikes
- Park staff can specify e-bike access
- Recommend noting state and local policies

Bureau of Land Management (Department of Interior)

- Similar to National Parks

National Forest (Department of Agriculture)

- In NC all classes of e-bikes are considered motor vehicles
- Only allowed on FS roads and motor vehicle access trails

State Level Access in NC



NC State Statutes

- Electric assisted bicycle is defined
 - Not three class definition, 750 watts and up to 20 under motor power
- Classified as a “vehicle” just like bicycles

NC State Parks

- Currently e-bikes allowed on all bike access trails
- Do not qualify as fully motorized



Local Access

City of Charlotte Public ROW

- E-bikes with separate definition from bicycles
 - Consistent with NC State Statute
 - Allowed ride in bike lanes, travel lanes, and shared use paths just as a bicycle would

Each local land manager has unique policies



Other guidance

East Coast Greenway

- Believe e-bike use greenways is generally acceptable
- Follow trail etiquette
- Practice safe passing



Other guidance

IMBA

- Support Class 1 e-mtb access on shared use trails
- As long as access is not lost for traditional mtb
- Recommend Class 1 e-mtbs be managed independently from traditional mtb with separate regulations
- 2015 class 1 e-mtb trail impact study



NEVs and Trails

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VP/GM Club Car



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2 Types of Neighborhood Electric Vehicles



PTV

- Personal Transportation Vehicle (PTV)
- 19mph maximum speed
- Turn signals, Brake Lights, Rear Mirrors

LSV

- Low Speed Vehicle
- 25mph maximum speed

Target Segments

- Baby Boomers
- Families with children

Manufacturers

- E-Z-Go
- Yamaha
- Club Car

The future of electric vehicles is golf carts, not Tesla

Fun and Sustainable



238 gallons of
avoided gasoline
will prevent:



4,654 lbs
of CO₂



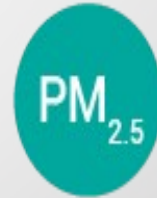
8.8 lbs
of NO_x



13 lbs
of VOC



118.8 lbs
of CO



0.1 lbs
of PM_{2.5}

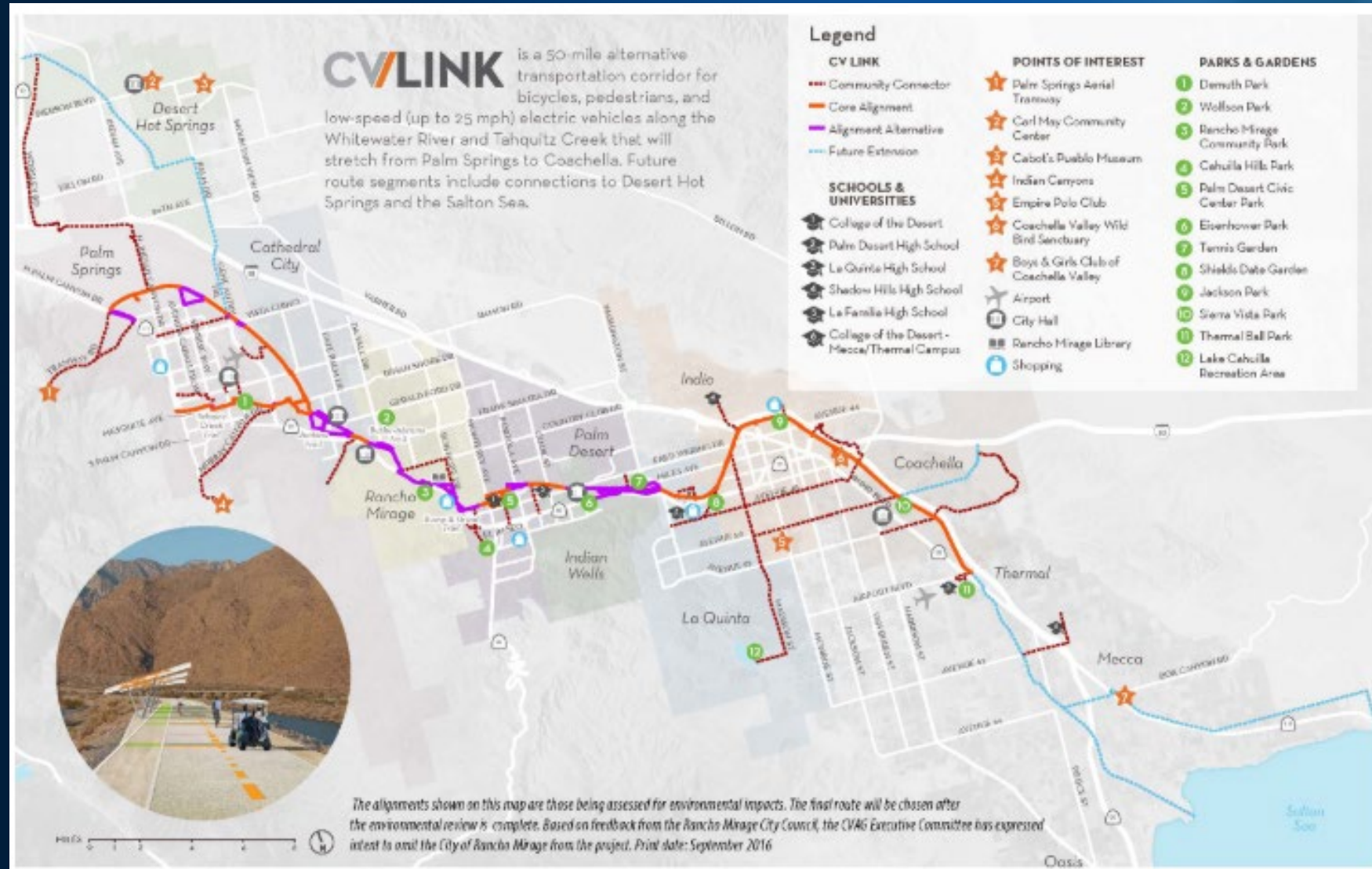


13.6 lbs
of THC

Source: EPA

“the experience the vehicle provides is more important than the vehicle itself” ~ Klevorn ‘19

Alternative Transportation Corridors



Discussion Topics

- Multi-use design and management of trails and paths
- Infrastructure needs
- Laws, policies and standards
- Revenue opportunities

Next Steps

- 2020 Personal Transportation Vehicle Seminar
Peachtree City, GA





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Questions to Ask & Discussion



Who Does the Trail
Serve Today and
Tomorrow?



Can the Trail's
Current Design
Accommodate
Different Uses?



Community Input +
Desires + Values?



How Can You
Make Technology
Work for You?



How Do We Define
+ Evaluate Success?



Thank you!

Will Washam, Bicycle Program Coordinator, City of Charlotte

Joe Michael, e-Bike Central owner/founder

Ross Atherton, VP/Club Car

John Cock, VP/Principal, Alta Planning + Design