



## Monterey County Active Transportation Plan

### 4. ACTIVE TRANSPORTATION BEST PRACTICES AND BENEFITS

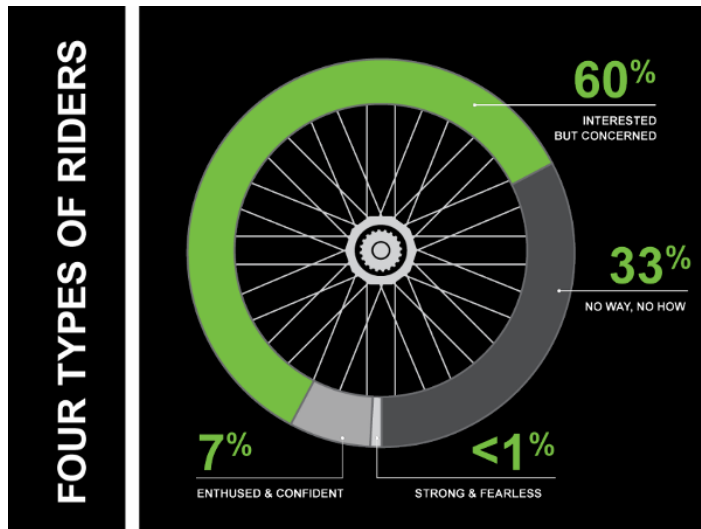
#### Bicycle Needs and Preferences

Bicyclists are generally grouped into four categories based on their experience and abilities. Based on surveys conducted in Portland and other communities around the nation, bicyclists have generally been divided into four types.

feel more comfortable using separated bike paths and physically protected bike lanes. To encourage the shift to bicycling for transportation, its important for communities to plan and build these types of improvements that can be used by families and novice riders. With these physically separated facilities, people that say they would never ride might be enticed to try bicycling for recreation.

#### Innovative Bicycle Facility Designs

Several new facility types are beginning to appear in communities across California. Most notably, protected bike lanes, bike boxes and protected intersections are innovative designs that improve safety for all users of the road. These treatments tend to slow traffic and make bicyclists and pedestrians more visible.



Source: People for Bikes

Strong and fearless bicyclists are those that are more experienced, and generally ride for recreation, touring and commuting. Enthusied and confident bicyclists have intermediate to advanced skills and generally feel comfortable commuting by bike. These bicyclists types need on-road bike lanes and routes that are well connected, wide shoulders where possible and wayfinding signage to make their trips more comfortable.

The majority of the community falls in the interested but concerned category. These tend to be novice riders, families and children who

#### Parking Protected Bike Lanes (E. Market Street, Salinas)



Using Active Transportation Program grant funds, the City of Salinas recently installed parking protected bike lanes on East Market Street by shifting parking away from the curb, and implementing a road diet on this segment



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of street in front of Fremont Elementary School. The City also added a bike box at the crossing to improve bicyclist visibility.

### Bike Box (E. Market Street, Salinas)



Much like bike boxes, protected intersections extend the curbs out and create islands for bicyclists and pedestrians. These intersections make bicyclists and pedestrians more visible to car traffic, and shorten crossing distances. Locally, the Canyon Del Rey (SR 218) Corridor Study is analyzing this design style for the intersection of Del Monte Ave and Canyon Del Rey Blvd in Seaside.

### Protected Intersection on El Camino Real (State Route 82)



Source: City of Menlo Park

## Protect Bike Lane Design Treatments



### STRIPED BUFFER

1.5 ft. additional width; \$8k-\$16k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



### DELINEATOR POSTS

1.5 ft. additional width; \$15k-\$30k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



### TURTLE BUMPS

1.5 ft. additional width; \$15k-\$30k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



### PARKED CARS

11 ft. for parking + buffer; \$8k-\$16k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



### PLANTERS

3 ft. additional width; \$80k-\$400k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



### RAISED BIKEWAY

No additional width; \$8m-\$26m per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹

Source: People for Bikes



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### Pedestrian Needs and Preferences

Similar to bicyclists, pedestrians can be divided into a few different types based on age and ability. These different pedestrian types have different challenges and design solutions:

	Challenges	Design Solutions
<b>Residents and pedestrian commuters</b>	Few crossings, little separation from moving vehicles, high traffic volumes, few destination access points, inadequate ADA access, little/no shade or shelter, poorly lit walkways and crossings, slippery surface materials, obstructed routes, inefficient drainage, indirect routes	Pedestrian signal actuation and adequate crossing time, traffic calming, continuous sidewalk network, short blocks, ample width, planting strip/on-street parking, ADA ramps, street trees and pedestrian-scale lighting appropriately designed storm drains
<b>Seniors and children</b>	Small gaps in traffic, long crossing distances, few crossings inadequate ADA access, shade or shelter, poorly lit walkways and crossings, slippery surface materials, obstructed routes, inefficient drainage	Adequate crossing time at signalized intersections, curb extensions, high-contrast markings, two-stage actuated crossings, medians, audible countdown pedestrian phase (signalized) and ADA ramps, street trees, pedestrian-scale lighting

<b>Visitors and tourists</b>	Few/no pedestrian destinations, limited/no way-finding, unmarked crossings, narrow sidewalks, little/no shade or shelter, few/no pedestrian amenities, poorly-lit walkways and crossings	Pedestrian plaza, way-finding signage, highcontrast marked crossings, wide sidewalks, onstreet parking, street trees, outdoor seating, public art, public toilets, pedestrian-scale lighting
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### Innovative Pedestrian Facility Designs

Many of the same innovative bicyclist treatments also benefit pedestrians. Protected intersections and protected bike lanes shorten pedestrian crossing distances. Other innovative treatments that benefit pedestrians are:

#### Leading Pedestrian Intervals



Source: PedBikeSafe



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Leading pedestrian intervals (LPI) give pedestrians a 3-7 second head start to begin crossing an intersection while vehicles still have a red light. LPI's enhance pedestrian visibility and reduce conflicts between pedestrians and vehicles turning right. LPI's have been shown to reduce pedestrian-vehicle collisions by 60%<sup>1</sup>.

### Rectangular Rapid Flash Beacon



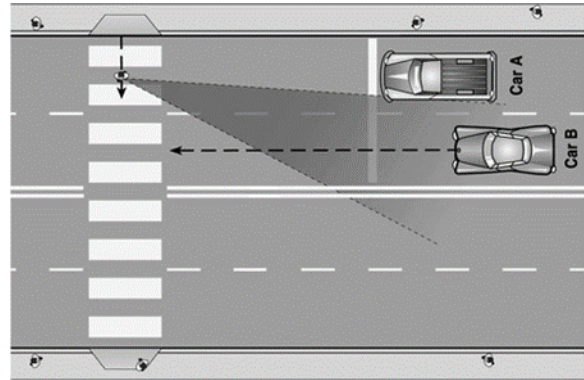
Source: City of Alexandria, VA

Rectangular Rapid Flash Beacons (RRFB) are activated pedestrian flashing lighted crosswalks that enhance pedestrian visibility at unsignalized intersections or mid-block crossings. RRFB's have been shown to significantly increase driver yielding behavior at crossings<sup>2</sup>. These types of crossings can also be used by bicyclists.

<sup>1</sup> National Association of City Transportation Officials (NACTO): <https://nacto.org/>

<sup>2</sup> NACTO

### Advanced Stop/Yield Lines



Source: PedBikeSafe

Advance stop/ yield lines encourage drivers to stop further back from the crosswalk. These lines encourage drivers to stop when there's a multi-lane roadway. These lines improve pedestrian visibility at mid-block or uncontrolled crossings.

### Pedestrian Bulbouts in Gonzales



Source: Google Maps

Pedestrian bulbouts shorten the pedestrian crossing, and increase pedestrian safety. Bulbouts tighten the curb radius for turning vehicles and slow traffic. These crossing treatments also increase space for street furniture, benches, plantings, and street trees.



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### Public Health, Environmental, Economic, and Social Equity Benefits

The following infographics summarize the many benefits of bicycling and walking for transportation. These graphics are courtesy of the Joint Venture Silicon Valley<sup>3</sup>.

## HEALTH BENEFITS

### Reduces cardiovascular risk.

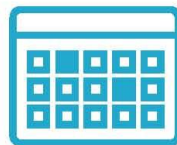
Regular bicycling, like bicycling to work, reduces cardiovascular risk by 11%.<sup>2</sup> Commuting by bicycle more than halves the likelihood of experiencing a heart attack.<sup>3</sup>



**-11%**  
cardiovascular  
risk

### Results in fewer sick days.

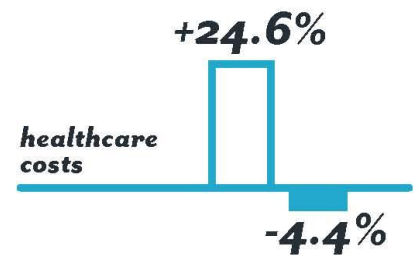
On average, bicyclists take 15% fewer sick days at work and live two years longer than non-bicyclists.<sup>4</sup>



**-15%**  
sick days

### Reduces health care costs.

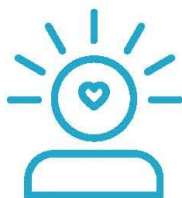
Using bike-to-work incentives can result in a 4.4% decrease in healthcare costs, compared to a national increase of 24.6% in healthcare costs.<sup>5</sup>



### Reduces stress.

Bicycle commuters are less stressed, have greater feelings of relaxation, and are more satisfied with their commute than those who drive or take transit to work, even in winter.<sup>6</sup>

less stress  
more satisfaction



### Bike-friendly growth decreases negative health outcomes.

Smart growth strategies that encourage bicycling can reduce premature deaths, heart attacks, asthma attacks, other respiratory symptoms, chronic and acute bronchitis, and respiratory-related ER visits.<sup>7</sup>

  
**>60**  
fewer  
premature  
deaths

**>95**  
Fewer cases of  
acute bronchitis



  
**>1,025**  
fewer  
asthma  
attacks

<sup>3</sup> Joint Venture Silicon Valley: <https://jointventure.org/>



## SAFETY BENEFITS

### *Bike lanes make roads safer for all.*

Protected bike lanes can result in a 40-50% drop in injury crashes for all road users (drivers, cyclists, and pedestrians).<sup>15</sup>



# 40-50%

**reduction in crashes on streets with protected bike lanes**



**... for all road users**

### *Bicyclists make roads safer for all.*

Cities with high bicycling rates ...



... tend to have lower crash rates for all road users.<sup>16</sup>

# Crashes



### *Build it safely and they will come.*

Bicycle safety improvements attract proportionately more people to bicycling than automobile safety improvements.<sup>17</sup>



For example, a

# 10%

**increase in bike safety will result in**

# more than 10%

**increase in the share of people commuting by bicycle.**



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## ENVIRONMENTAL BENEFITS

### Biking to work reduces CO<sub>2</sub>.

Commuting four miles by bike saves 2,000 miles of driving and 2,000 lbs of CO<sub>2</sub> per year.<sup>8</sup>

**4 mile bike commute results in:**

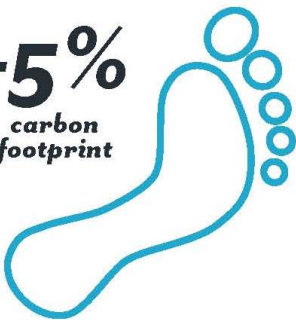
**-2,000 lbs of CO<sub>2</sub>**



**-2,000 miles of driving**

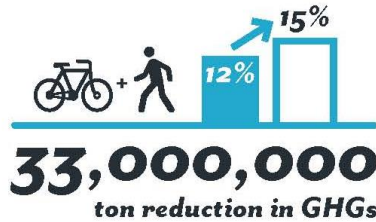
That's the equivalent of a 5% reduction in the average American's carbon footprint!

**-5% carbon footprint**

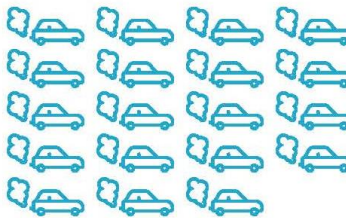


### More overall walk and bike trips reduces CO<sub>2</sub>.

Increasing the mode share of all bike and walking trips from 12% to 15% could lead to fuel savings of 3.8 billion gallons per year and a 33-million-ton reduction in GHGs per year.<sup>9</sup>



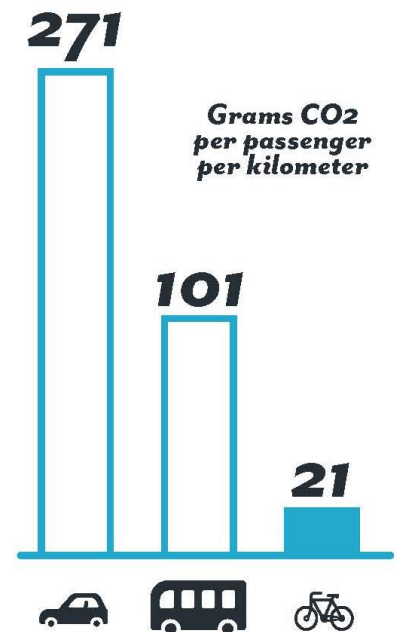
That is equivalent to replacing 19 million conventional cars with hybrids!



**19M conventional cars** → **hybrid cars**

### Bikes have a carbon-neutral life cycle.

When the complete life cycle of the following modes are taken into account, the carbon emissions (grams per passenger per kilometer) are approximately:<sup>10</sup>





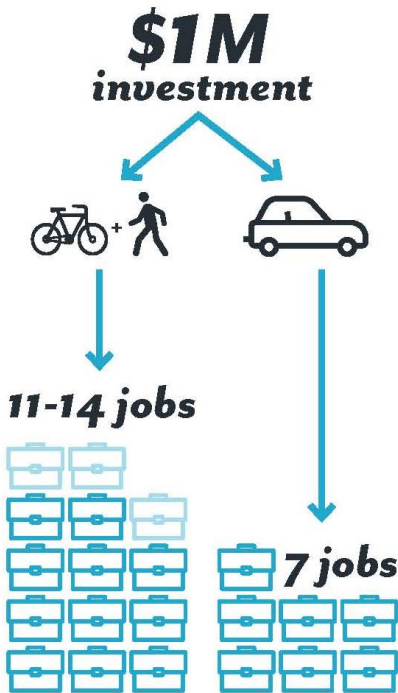
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### ECONOMIC BENEFITS

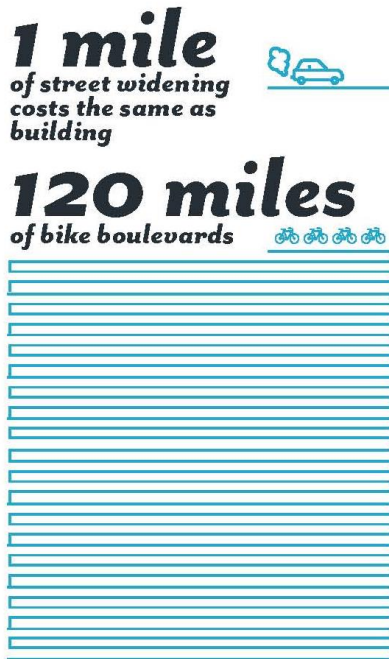
#### Bike projects create more jobs.

Bicycling and walking projects create 11-14 jobs per \$1M spent, versus only seven jobs per \$1M spent on highway projects.<sup>11</sup>



#### Bike lanes are less expensive than roads.

One mile of street widening for cars is equivalent to 600 miles of bike lanes; 300 miles of buffered bike lanes; 120 miles of bike boulevards; and 30 miles of off-street bike trails.<sup>12</sup>



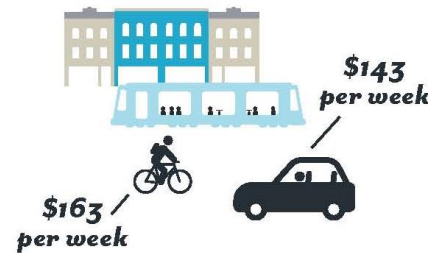
#### Bike parking costs less to build than car parking.

It costs \$150-\$300 to install a bike rack for two bikes compared to \$36,000 for one parking spot in a parking structure in Silicon Valley.<sup>7,13</sup>



#### Bicyclists spend more on local retail.

People on bicycles spend more on local retail per week than other modes: \$163 per week compared to \$143 per week.<sup>14</sup>





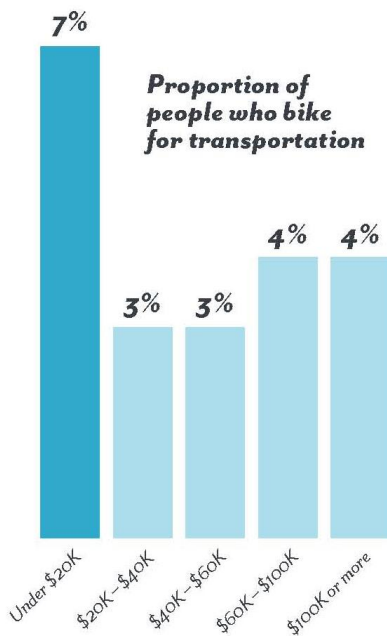


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### SOCIAL EQUITY BENEFITS

#### The lowest-income households bike most.

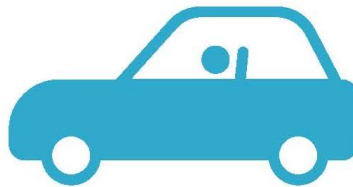
Households earning less than \$20,000 per year are roughly twice as likely to bike for transportation as all other income groups.<sup>18</sup>



#### Bicycling is more affordable.

The average cost of operating a vehicle for one year in 2013 was approximately \$10,000. The cost of operating a bicycle for a year in 2013 was roughly \$300.<sup>19</sup>

**\$10,374**  
per year



**\$308**  
per year



#### Bicycling benefits zero-vehicle households.

Households with people of color are less likely to have access to a motor vehicle.<sup>20</sup>

#### Share of U.S. households without motor vehicles

