



## **The Nexus for Dedicating California's Cap-and-Trade Program Revenues to Active Transportation**

Significant investments in walking and bicycling in coordination with transit and land use investments offer cost effective opportunities to implement AB 32 and reduce greenhouse gas emissions (GHG) in California. Specifically, investments in comprehensive bicycling and multi-use trail networks, first and last mile connections to transit, Safe Routes to School programs, and the creation of walkable neighborhoods through new and in-fill development all offer opportunities to reduce vehicle miles traveled (VMT), reduce GHG emissions and improve the health of Californians and their economy.

### **Existing need for added investments in bicycle and pedestrian infrastructure:**

In California there is currently an enormous need for additional bicycle and pedestrian infrastructure to provide Californians with safe and equitable transportation options.

- Approximately 15 percent of all trips in California are currently made by bicycling or walking according to the 2009 National Household Travel Survey.
- Approximately 23.2 percent of serious roadway injuries and fatalities in California involve a bicyclist or pedestrian according to 2008-2010 SWITRS data.
- According to the 2009 American Community Survey approximately 18 percent of California households do not have a driver's license.<sup>1</sup>

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<sup>1</sup> Assumes the population eligible to obtain a driver's license is 29,199,714 and that 23,681,000 Californians have drivers licenses. License information found here <http://www.census.gov/compendia/statab/2012/tables/12s1098.pdf>. Population of Californians 15 years and older from the 2009 American Community Survey found here [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_09\\_1YR\\_S0101&prodType=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_09_1YR_S0101&prodType=table).

- Approximately 50 percent of all trips in California are under 3 miles<sup>2</sup> and 60 percent of trips under one mile are currently taken by automobile.<sup>3</sup> These trips can easily be accomplished by walking or bicycling.
- In 2012 California had 6,207,064 students in K-12 (representing approximately 16% of the State's population) most of whom cannot drive and need improved mobility options.<sup>4</sup> Approximately 62.4 percent of children in CA live within two miles of school, yet 51 percent of these children are driven to school in a private vehicle.<sup>5</sup>

Increased levels of bicycling and walking must play a part in reducing GHG emissions if California wants to meet the targets set by AB 32. Automobiles and light trucks account for approximately 50 percent of air pollution (40 percent of GHG emissions) in California and 70 percent of its consumption of petroleum.<sup>6</sup> Much of the GHG emission benefits that will be realized by motor vehicle efficiencies in the coming years will be offset by increases in VMT.<sup>7</sup> These increases will be caused in large part by the addition of 12 million new residents to the state from 2015-2050.<sup>8</sup> Therefore, SB 375 must be implemented in a way that reduces VMT and provides land use patterns that decrease the number of trips that are taken by motorized vehicles.

### **GHG Reductions from Bicycling and Walking:**

Walking, bicycling and first-last mile access improvements to transit can have significant impacts on mode shift and reduce GHG emissions. Numerous studies link investments in bicycle and pedestrian infrastructure improvements to increases in bicycling and walking. It is estimated that each shift in mode share from private automobiles to non-emitting modes

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<sup>2</sup> 2009 NHTS, Caltrans. Referenced at:

[http://saferoutescalifornia.wordpress.com/2012/05/31/trip\\_distance\\_ca2009/](http://saferoutescalifornia.wordpress.com/2012/05/31/trip_distance_ca2009/).

<sup>3</sup> McGuckin, Nancy, Walking and Biking in California: Analysis of the CA-NHTS. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-12-13 (2012).

<sup>4</sup> California Department of Finance, Referenced at:

[http://www.dof.ca.gov/research/demographic/reports/projections/k-12/documents/2012Series\\_K-12\\_Reports\\_Internet.xls](http://www.dof.ca.gov/research/demographic/reports/projections/k-12/documents/2012Series_K-12_Reports_Internet.xls)

<sup>5</sup> 2009 NHTS, Analysis performed by Nancy McGuckin. Referenced at:

<http://saferoutescalifornia.files.wordpress.com/2013/02/travel-to-school-in-california-policy-brief-final-pages.pdf>

<sup>6</sup> SB 375 Text, Referenced at: [http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb\\_0351-0400/sb\\_375\\_bill\\_20080930\\_chaptered.pdf](http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf)

<sup>7</sup> Urban Land Institute. "Growing Cooler: The Evidence on Urban Development and Climate Change."

Distributed by Independent Publishers Group, October 2007, Referenced at:

[http://postcarboncities.net/files/SGA\\_GrowingCooler9-18-07small.pdf](http://postcarboncities.net/files/SGA_GrowingCooler9-18-07small.pdf)

<sup>8</sup> California Department of Finance, "Interim Population Projections for California and Its Counties 2010-2050." Referenced at:

[http://www.dof.ca.gov/research/demographic/reports/projections/interim/documents/Final\\_2012\\_Interim\\_Proj\\_Web.xls](http://www.dof.ca.gov/research/demographic/reports/projections/interim/documents/Final_2012_Interim_Proj_Web.xls)

produces significant and measurable decreases in GHG emissions.<sup>9</sup> Several studies of urban areas have shown that significant investments in active transportation networks could achieve between 8-14.5 percent reductions in GHG emissions.<sup>10 11</sup> When combined with Transportation Demand Management strategies, land use changes and transit improvements these reductions can be even greater.<sup>12</sup>

**Increasing rates of walking and bicycling can reduce emissions GHG.** A recent study by the California Department of Public Health noted that “an ambitious, but achievable shift in mode share to active transport in the San Francisco Bay Area could reduce GHG emissions from personal passenger vehicles by 14.5 percent, while reducing the burden of chronic diseases, such as heart attacks, stroke, and diabetes, by 15 percent.”<sup>13</sup> According to a report on bicycling in the European Union (EU), if the entire EU increased its levels of bicycling equivalent to “those found in Denmark, bicycle use would help achieve 12 to 26 percent of the 2050 GHG target reduction set for the transport sector.”<sup>14</sup> The City of Seattle estimates that for every \$7,700 spent on pedestrian infrastructure and every \$5,000-\$15,000 spent on bicycle infrastructure, one ton of carbon will be removed per year. Seattle also estimates that these investments will also improve the cost effectiveness of other investments in transit and TDM strategies.<sup>15</sup> The City of Sunnyvale Draft Climate Action Plan estimates that approximately 10 percent of its transportation related emissions reductions can come from a combination of bicycle, pedestrian and Safe Routes to School strategies.<sup>16</sup>

**Reducing VMT by mode shift for short trips.** It is estimated that VMT reductions of up to 20 percent could be achieved if 50 percent of short trips under 8 km were achieved by walking and

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<sup>9</sup> Joel Woodhull, Jim McGreen, and Dave Erickson. “*Transportation: Opportunities For Greenhouse Gas Emission Reduction In Sonoma County - Community Climate Action Plan.*” Climate Protection Campaign, August 2008.

<sup>10</sup> City of Seattle Office of Sustainability & Environment, “*Technical Advisory Group Recommendations for the Seattle Climate Action Plan Update - Transportation and Land Use Sectors Final Summary Report,*” Nelson Nygard 2009. Accessed at:  
[http://www.seattle.gov/environment/documents/TAG\\_Transp&LandUse\\_Report.pdf](http://www.seattle.gov/environment/documents/TAG_Transp&LandUse_Report.pdf)

<sup>11</sup> Neil Maizlish, PhD. “*Health Co-Benefits and Transportation Related Reductions in Greenhouse Gas Emissions in the Bay Area.*” California Department of Public Health, November 2011.

<sup>12</sup> Michelle, Lauren, “*Policy in Motion – Transportation Planning After AB 32,*” Policy in Motion, Sacramento, CA (2011).

<sup>13</sup> Neil Maizlish, PhD. “*Health Co-Benefits and Transportation Related Reductions in Greenhouse Gas Emissions in the Bay Area.*” California Department of Public Health, November 2011.

<sup>14</sup> European Cyclists Federation. “*Cycle more Often 2 cool down the planet! Quantifying CO2 savings of Cycling.*” November 2011.

<sup>15</sup> City of Seattle Office of Sustainability & Environment, “*Technical Advisory Group Recommendations for the Seattle Climate Action Plan Update - Transportation and Land Use Sectors Final Summary Report,*” Nelson Nygard 2009. Referenced at:  
[http://www.seattle.gov/environment/documents/TAG\\_Transp&LandUse\\_Report.pdf](http://www.seattle.gov/environment/documents/TAG_Transp&LandUse_Report.pdf)

<sup>16</sup> Percentage achieved by dividing the 7,430 tons of annual CO2 reductions from bicycle, pedestrian and SRTS strategies by the 76,260 tons achieved from expanding Sustainable Circulation and Transportation Options and Optimizing vehicle travel. The draft plan can be accessed at:  
[http://www.pmcworld.com/client/sunnyvale/documents/cap/Sunnyvale-CAP\\_draft-11-2011.pdf](http://www.pmcworld.com/client/sunnyvale/documents/cap/Sunnyvale-CAP_draft-11-2011.pdf)

bicycling in the urban areas of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.<sup>17</sup> Likewise, according to the Environmental Protection Agency, “A shift of automobile trips to either bicycle or walk trips has a direct, positive impact in that trip emissions are reduced by 100 percent. Bicycling and walking realistically can substitute for relatively short trips which make up approximately 60 percent of all trips (i.e., generally less than five miles in length). Although the amount of saved vehicle miles traveled (VMT) may be small, the air emissions benefits can be quite large because cold start and hot soak emissions comprise a large proportion of emissions from a vehicle trip.”<sup>18</sup>

**First Mile-Last Mile and Pedestrian investments can reduce GHG and VMT.** Recent research has demonstrated that only “moderate increases in sidewalk infrastructure may be needed to yield significant decreases in VMT and associated CO<sub>2</sub>.”<sup>19</sup> It has been estimated that a comprehensive approach including complete sidewalk coverage and improved transit service along a single corridor in Washington State would improve the rate of VMT reductions from 8 percent to 48 percent and improve the rate of GHG reductions from 1.65 percent to 27 percent.<sup>20</sup>

**Providing Safe Routes to School can provide congestion relief and reduce GHG emissions.** Approximately 60 percent of students in California are driven to school in a family automobile.<sup>21</sup> Studies have shown that nationwide school trips can account for 10-26 percent of morning rush hour congestion.<sup>22</sup> Safe Routes to School programs have increased rates of walking and bicycling to and from schools, which reduces congestion and GHG emissions. A report by Caltrans to the California Legislature in 2007 reported that Safe Routes to School Programs increased walking and bicycling in California schools in the range of 20 to 200 percent.<sup>23</sup> Additionally, significant investments in bicycle and walking infrastructure combined

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<sup>17</sup> Environmental Health Perspectives, “*Air Quality and Exercise-Related Health Benefits from Reduced Car Travel in the Midwestern United States.*” Referenced at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3261937/>

<sup>18</sup> Transportation Control measure Information Documents, Cambridge Systematics, Inc., U.S. Environmental Protection Agency, Washington, D.C. (March 1992).

<sup>19</sup> Dr. Lawrence D. Frank (P.I.), Dr. Michael J. Greenwald, Ms. Sarah Kavage, Mr. Andrew Devlin. “*An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy.*” Urban Design 4 Health, Inc. and the Washington State Department of Transportation, April 2011.

<sup>20</sup> Dr. Lawrence D. Frank (P.I.), Dr. Michael J. Greenwald, Ms. Sarah Kavage, Mr. Andrew Devlin. “*An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy.*” Urban Design 4 Health, Inc. and the Washington State Department of Transportation, April 2011.

<sup>21</sup> Claudia Chaufan, MD, PhD, Jarmin Yeh, MSSW, MPH, and Patrick Fox, PhD, MSW. “*The Safe Routes to School Program in California: An Update.*” The American Journal of Public Health, April 2011.

<sup>22</sup> Parisi Associates. (2003). Transportation Tools to Improve Children’s Health and Mobility. Referenced at: <http://www.dot.ca.gov/hq/LocalPrograms/TransportationToolsforSR2S.pdf>.

<sup>23</sup> Caltrans, “*Safe Routes to School Safety and Mobility Analysis*” (2007), Referenced at: <http://escholarship.org/uc/item/5455454c#page-1>.

with educational and encouragement activities can lead to significant reductions in congestion (10-13 percent) and associated GHG emissions.<sup>24</sup>

**Walkable Neighborhoods Reduce GHG Emissions.** According to the ARB, “strategies that improve the walking environment have the potential to also reduce vehicle trips and vehicle miles traveled (VMT), both by supporting walking as a replacement for driving and by enhancing pedestrian access to transit.”<sup>25</sup> Compact urban neighborhoods built to encourage pedestrian travel can drastically reduce GHG produced through transportation.<sup>26</sup> By shifting 60 percent of new growth to compact patterns, the United States would save 85 million tons of CO<sub>2</sub> annually by 2030. Creating walkable neighborhoods can also be more efficient than providing transit alone. According to a study by the American Public Transit Association, walkable neighborhoods in combination with transit are 1.9 times more effective than transit alone.<sup>27</sup> Given that California is expected to add an additional 12 million residents between by 2050,<sup>28</sup> it is imperative that this growth is managed in a way that reduces VMT and promotes walking and bicycling.

### **Co-Benefits of Bicycling and Walking:**

There are numerous co-benefits that can be gained by encouraging people to walk and bicycle. In addition to reducing GHG reductions, revenues generated by cap-and-trade should encourage projects that promote public health and benefit disadvantaged communities. Active transportation offers unique co-benefits when compared to other modes and should be evaluated favorably when distributing cap-and-trade revenues.

### **Safety improvements for bicyclists and pedestrians can save lives and dollars.**

Approximately 23.2 percent of serious roadway injuries and fatalities in California involve a bicyclist or pedestrian according to 2008-2010 SWITRS data. The Center for Disease Control estimates that these collisions cost the state approximately \$812 million dollars in 2005 due to lost productivity and medical related costs from deaths alone.<sup>29</sup> By improving safety conditions

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<sup>24</sup> Sustrans. “*Low Carbon Travel: Reducing the Climate Change Impact of Road Transportation - Fact Sheet FF44.*” <http://www.sustrans.org.uk/assets/files/Info%20sheets/ff44.pdf>

<sup>25</sup> Gian-Claudia Sciara, Susan Handy and Marlon Boarnet. “*DRAFT Policy Brief on the Impacts of Pedestrian Strategies Based on a Review of the Empirical Literature.*” [http://www.arb.ca.gov/cc/sb375/policies/ped/ped\\_brief.pdf](http://www.arb.ca.gov/cc/sb375/policies/ped/ped_brief.pdf)

<sup>26</sup> Urban Land Institute, “*Growing Cooler: The Evidence on Urban Development and Climate Change.*” Distributed by Independent Publishers Group, October 2007.

<sup>27</sup> ICF International for the American Public Transit Association. “*The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction.*” February 2008.

<sup>28</sup> California Department of Finance, “*Interim Population Projections for California and Its Counties 2010-2050.*” Accessed at: [http://www.dof.ca.gov/research/demographic/reports/projections/interim/documents/Final\\_2012\\_Interim\\_Proj\\_Web.xls](http://www.dof.ca.gov/research/demographic/reports/projections/interim/documents/Final_2012_Interim_Proj_Web.xls)

<sup>29</sup> Center for Disease Control, “*Costs of Deaths from Motor Vehicle Crashes in California,*” Referenced 12-17-12, <http://www.cdc.gov/Motorvehiclesafety/statecosts/ca.html#cost>.

for bicyclists and pedestrians California has the opportunity to save thousands of lives and millions of dollars.

**Significant health care cost savings can be achieved by shifting short trips to bicycling and walking.** According to a study of 37 million people (approximately the population of California), it was estimated that if 50 percent of short trips were made by bicycling and walking it would save an estimated \$8 billion annually from improved air quality and physical fitness.<sup>30</sup> It is currently estimated that in California the cost of overweight, obesity and physical inactivity has climbed to \$41 billion in 2006, nearly double the amount reported in 2000.<sup>31</sup>

**Investments in bicycling and pedestrian infrastructure are cost effective and promote economic development.** According to a study of the Little Miami Scenic Trail, for every foot closer a house is to the trail, its price increases by \$7.05 per sq. ft.<sup>32</sup> Houses located in areas with above-average levels of walkability or bikeability are worth up to \$34,000 more than similar houses in areas with average walkability levels.<sup>33</sup> The City of Lancaster invested \$10 million to create a walkable downtown. The City has since seen 2000 jobs created, 50 new business open, over 100 units of housing created and over \$100 million in private investment.<sup>34</sup> When investing in walking and bicycling infrastructure it is also important to work with housing agencies to put anti-displacement policies in place for lower-income residents, so that active transportation can improve safety and mobility, but also allow local residents to remain in their communities.

**Bicycle and pedestrian infrastructure creates more jobs per million \$ spent.** A recent study showed that active transportation projects create more jobs per dollar spent than do road and highway projects without an active transportation component. For each \$1 million spent, bicycle and pedestrian projects created a total of between 9.5 and 11.4 jobs while road-only projects created 7.8 jobs per \$1 million spent.<sup>35</sup> Furthermore, American households devote 19 percent of every dollar, on average, or \$7,633, to transportation expenses, the second largest expense category. One study shows that for every reduction of 15,000 owned cars, a city keeps \$127 million in the local economy as people get what they need within a smaller geographic

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<sup>30</sup> Environmental Health Perspectives, "Air Quality and Exercise-Related Health Benefits from Reduced Car Travel in the Midwestern United States." Referenced at:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3261937/>

<sup>31</sup> California Center for Public Health Advocacy, "The Economic Costs of Overweight, Obesity, and Physical Activity Among California Adults – 2006," Referenced at:

<http://www.publichealthadvocacy.org/costofobesity.html>

<sup>32</sup> Greer, D. L. "Omaha Recreational Trails: Their Effect on Property Values and Public Safety, National Park Service," University of Nebraska at Omaha, June, 2000

<sup>33</sup> Political Economy Research Institute, "Bicycle and Pedestrian Infrastructure: A National Study of Employment Impacts", Heidi Garrett-Peltier, Referenced at:

<http://www.peri.umass.edu/236/hash/64a34bab6a183a2fc06fdc212875a3ad/publication/467>

<sup>34</sup> Safe Routes to School National Partnership, "Complete Streets for Prosperity," Referenced at: <http://saferoutescalifornia.wordpress.com/?s=lanaster>

<sup>35</sup> Karadeniz, D., 2008, The Impact of the Little Miami Scenic Trail on Single Family Property Values, University of Cincinnati Masters Thesis

area.<sup>36</sup> Providing active transportation alternatives such as bicycling for Californians is more than just good transportation policy, its good fiscal policy, helping families save hard-earned money during tight economic times.

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<sup>36</sup> Susan Piedmont-Palladino, "The Space-Time-Money Continuum," National Building Museum, Referenced at: <http://www.nbm.org/intelligentcities/topics/city/city-essay.html#full>