

## **CHAPTER 3:** **SUSTAINABLE TRANSPORTATION & LAND USE**

### **A. THE VISION:** **CYCLING, WALKING, PUBLIC TRANSIT AND OTHER SUSTAINABLE MODES OF TRANSPORTATION BECOME MAINSTREAM**

According to Berkeley's most recent greenhouse gas emissions inventory, vehicle trips (including cars, trucks, buses and motorcycles) within Berkeley city limits account for 47 percent of Berkeley's total greenhouse gas emissions, approximately 265,500 metric tons CO<sub>2</sub>e (MTCO<sub>2</sub>e) per year in 2005. Gasoline consumption in automobiles is the single largest source of emissions in Berkeley.<sup>15</sup>

In order for the community to achieve its GHG reduction target, transportation-related GHG emissions must decline by approximately 30 percent by the year 2020. This equates to an annual reduction of about 90,000 MTCO<sub>2</sub>e within the next 12 years. This is the equivalent of reducing gasoline consumption by over 9.2 million gallons per year by 2020.

To say that achieving this target requires significant change is an understatement. Transportation modes such as public transit, walking and bicycling must become the primary means of fulfilling our mobility needs, and remaining motor vehicle use must be far less carbon-intensive. More active modes of transportation will become the mainstream when they are as convenient and cost effective as driving.

Shifting the balance toward sustainable transportation modes requires a combination of policies, consumer education initiatives, sustained sources of revenue, and effective incentives. In essence, it requires assembling policies and programs that together will aggressively reduce vehicle miles traveled (VMT) and the associated GHG emissions, while also improving community mobility and quality of life. The main pieces of Berkeley's "mobility management puzzle" are:

- **Smart Growth:** Increased density near transit is the single most effective means for reducing transportation-related GHG emissions in the long-term. "Walkability," "bikeability" and ridership of public transit are fundamentally tied to density and a mix of land uses near transit hubs and jobs (such as in Downtown Berkeley) and along transit corridors (such as San Pablo and University Avenues). To maximize quality of life benefits as well as GHG reductions, Smart Growth in Berkeley must be "green growth." It should support enhanced green space, urban forestry efforts and local food production; green building measures; and effective water conservation and storm water management practices.
- **Increased Safety, Reliability and Frequency of Existing Public Transit:** BART and AC Transit provide essential services to the people of Berkeley and beyond. In order for public transit to become mainstream, these services must expand, improve customer service, and be integrated into a broader mobility management system that includes shuttles, the bicycle and pedestrian network, car sharing, and more.

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<sup>15</sup> The current community-level GHG inventory methodology (provided by ICLEI) measures only the emissions that occur within city limits. It therefore does not include the emissions that result from freeway traffic, airplanes and boats, and vehicle travel on UC Berkeley and Lawrence Berkeley National Laboratory campuses. It also does not include the emissions that result from Berkeley citizens driving outside City limits or from people driving to Berkeley (until they reach the City limit). Please see Chapter 2 for a full description of the emissions inventory methodology.

- **Expansion of other Underused Modes:** AC Transit buses and BART trains serve as the north/south backbone of the East Bay’s public transit system. In general, east/west transit service is less frequent, and development of other transit modes is necessary to truly enable community members to travel from their neighborhoods to destinations throughout the City without a car. Travel modes expected to be increasingly important parts of Berkeley’s mobility management system include:
  - A network of short-route local transit buses, i.e., employer-based and commercial shuttles and on-demand vehicles
  - A larger network of car share pods conveniently located adjacent to transit networks and in neighborhoods underserved by transportation alternatives
  - An increased role for rideshare/casual carpool programs
  - An expanded bicycle and pedestrian infrastructure including bicycle share programs
  - An increased role for taxis
  - A ferry system that is fully integrated into existing transit services
  - Neighborhood electric vehicles

These modes of transportation must be integrated with AC Transit buses and BART to form a comprehensive, convenient alternative transportation network that connects people to key destinations.

- **Pricing Strategies:** As well as encouraging residents to choose an alternative to the car, it is important that those who choose or need to drive a car pay the full costs, including environmental costs, of doing so. This is especially true for individuals who drive alone. Examples of how these costs may be addressed in Berkeley include:
  - Expanding parking pricing (e.g., meters and/or permit zones) to certain areas where parking is currently free
  - Implementing a parking fee that would make it more expensive for individuals to own multiple cars
  - Increasing parking costs associated with existing on and off-street parking facilities

In addition to local efforts, the City and its residents can also support regional pricing strategies such as:

- Instituting a carbon tax on gasoline
- Implementing “Pay-As-You-Drive” programs in which motorists have the opportunity to lower their insurance costs by driving less

As well as serving as a disincentive to driving, such fees also serve to build revenue that can be used to provide enhanced, more sustainable mobility options in Berkeley and in the region. Action must be taken to ensure that any additional fees do not negatively affect low-income households. On the contrary, fees should be structured and employed to improve access to a range of transportation modes.

- **Enhanced Marketing, Community Education, and Incentives:** Behavior change underlies the success of each of the components outlined above. The City of Berkeley and its partners must combine efforts in the policy arena with targeted education for residents and businesses and savvy marketing of sustainable mobility options.

Each of the components outlined above is described in more detail, along with implementation steps and timelines, later in this chapter.

## **B. A GROWING PROBLEM: DEPENDENCE ON DRIVING**

Achieving the scale of reductions necessary to reach the community’s target is a truly daunting task.

Why is the task so daunting?

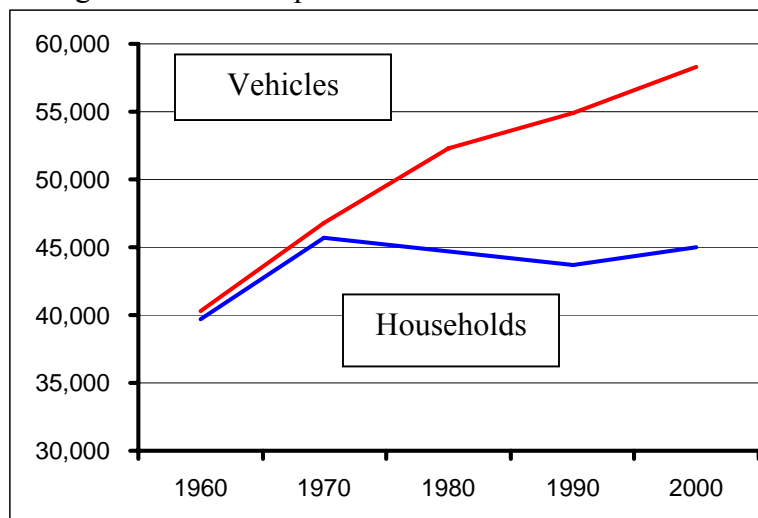
To answer that question it is helpful to visualize the challenge of reducing GHG emissions from the transportation sector as a three-legged stool. One leg represents vehicle fuel efficiency; the second leg represents the fuel's carbon content; and the third leg represents the amount vehicles are driven, known as vehicle miles traveled (VMT). Until recently, legislation at the state and federal levels has largely focused on the first two legs of the stool. Such legislation is essential and effective, but a stool needs three legs to stand.

Technological improvements that result in increased fuel efficiency and lower carbon fuels are being overwhelmed by the steady increase in VMT. Between 1983 and 2001, personal travel in the U.S. grew at an annual rate of 3.6 percent. Since 1982, VMT has increased by 47 percent per person, from an average of 6,800 miles per person per year to almost 10,000 miles per person per year.<sup>16</sup> Since 1980, the number of miles Americans drive has grown three times faster than the U.S. population, and almost twice as fast as vehicle registrations.

Upward swings in gasoline prices tend to moderate these trends to some degree. But given the difficulty in changing the factors that contribute to increasing VMT, such as low-density community design and people's decisions about where they want to live, it will take many years to reverse current trends.

Close to home, the San Francisco Bay Area is expected to grow by nearly 2 million people, a million cars, over 700,000 new homes, 1.8 million new jobs, and a tripling in freight volumes between 2000 and 2035. The number of daily vehicle trips is expected to increase by 5 million per day and the daily VMT will increase by 50 million miles per day by 2030.<sup>17</sup>

The City of Berkeley is not immune to such trends. For example, vehicle ownership has been growing steadily for many years. In 2000, there were approximately 59,500 privately owned cars in Berkeley, nearly 20,000 more than there were in 1960. This is true even though the population of the city has remained essentially steady since the 1970's. In fact, between 1970 and 1990, the Berkeley population decreased by over 13,000 people, while the number of cars owned by Berkeley residents *increased* by approximately 10,000 during that same time period.



**Berkeley household and vehicle population since 1960<sup>18</sup>**

<sup>16</sup> FHWA Traffic Volume Trends, August 2007

<sup>17</sup> Metropolitan Transportation Commission

<sup>18</sup> U.S. Census, 2000

In short, as a community, as a region, and as a nation, we are increasingly dependent on driving. The problem of steadily increasing VMT makes it such that transportation-related GHG emissions will likely stay far above the reduction targets established at the state-level by California's Global Warming Solutions Act (AB 32) and at the local-level by Berkeley's Measure G.

## **C. MAKING THE CONNECTION: LAND USE, GLOBAL WARMING & LIVABILITY**

Achieving state and local climate protection goals makes reducing VMT an imperative. How does a rapidly growing Bay Area – which is expected to grow by two million people, one million cars, and 1.8 million jobs by 2035 – succeed at reducing the growth in VMT? The answer lies in a multi-faceted approach, including more citizen education and outreach, strategic transportation pricing, and an enhanced alternative transportation infrastructure. A fundamental component of the approach also lies in growing in a way that makes it easier for community members to drive less.

A large and growing body of evidence shows that living near transit is the single largest influence on vehicle miles traveled.<sup>19</sup> Overall, the evidence shows that people who live near transit drive between 20 and 40 percent less. Accordingly, the most effective strategy for reducing VMT in the long-term is to site new housing near transit.

The benefits of building more housing in proximity to transit are not only environmental. Compact development patterns result in improved public health (by reducing local air pollutants associated with driving and by promoting a more active lifestyle) and improved access to alternative forms of transportation. In Berkeley, more housing near transit hubs and corridors means more customers for local businesses. Importantly, transit-oriented, walkable, bikeable communities are also more resilient to a volatile economy. For example, housing values in transit-rich areas such as Berkeley are more stable than in the outlying areas of the region. As

### **The Relationship between Density in Berkeley and GHG Emissions in the Region**

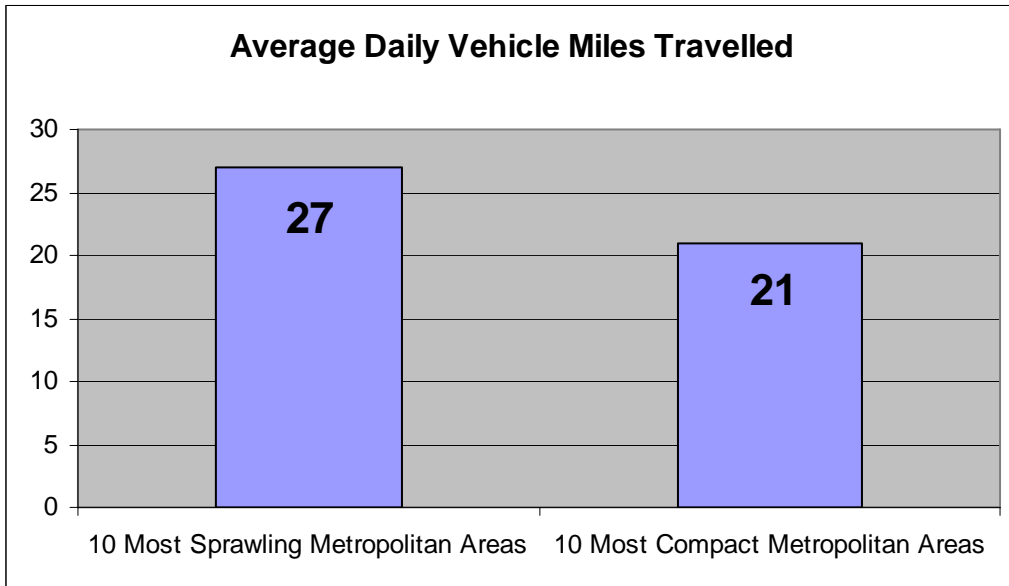
The Bay Area is expected to grow by two million people by 2035. Berkeley, like all communities, is responsible for absorbing a share of the increased housing demand associated with expected population growth. If one community does not accommodate its share by not providing enough housing supply, then presumably other communities will be forced to accommodate more than their share.

Given the fact that Berkeley is a transit-rich, walkable community as compared to most communities in the region, it is safe to assume that if Berkeley does not accommodate its share of the region's growth, then that growth will occur in areas that are less walkable and transit-rich, and therefore have higher levels of car use and the associated GHG emissions. Conversely, if Berkeley does accommodate its share of growth by providing additional housing units in transit-oriented areas, then Berkeley would be playing a role to effectively reduce regional GHG emissions.

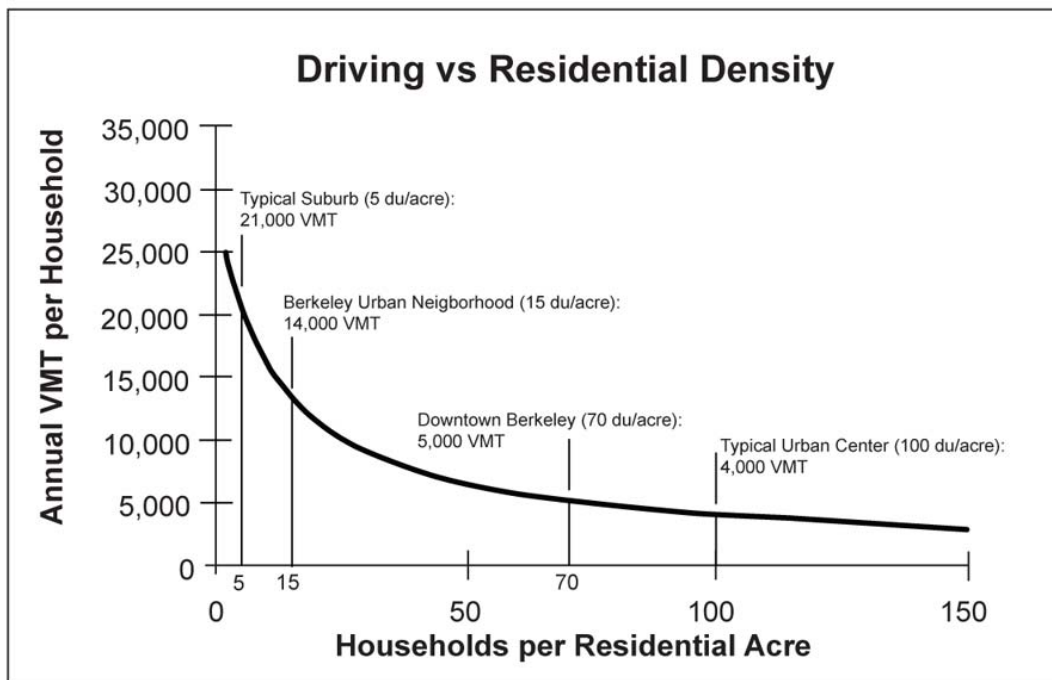
See Chapter 2 for additional discussion regarding regional growth forecasts and their effect on Berkeley's emissions and emissions reduction targets.

<sup>19</sup> The correlation between density and VMT has been measured in studies including but not limited to: a) Holtzclaw et al, "Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use---Studies in Chicago, Los Angeles and San Francisco;" b) Norman et al, "Comparing High and Low Residential Density: Life-Cycle Analysis of Energy Use and Greenhouse Gas Emissions;" c) Cervero, The Transit Metropolis; d) Cervero et al, "Travel Characteristics of Transit-Oriented Development in California;" e) Dittmar & Ohland, The New Transit Town; f) Center for Neighborhood Technology, "Hidden in Plain Sight."

gas prices inevitably increase, Berkeley residents are also better able than most in the region to hop on transit, walk or ride their bike to fulfill their mobility needs. And transit-friendly, walkable, bikeable communities are also important to maintaining quality of life for the elderly. By 2035 one quarter of the Bay Area population will be over 65 years of age. It is important for older people who would rather not or who are unable to drive to still get around town without having to get behind the wheel.



Source: Ewing, Pendall, and Chen 2002



When municipalities encourage density, they also encourage reduction in VMT. (Adapted from Holtzclaw 2002)

While options to improve vehicle fuel efficiency and fuel carbon content are relatively limited at the local level (and are largely addressed through state and federal policy), cities like Berkeley do have

significant power to direct any new residential and commercial development toward locations that are close to transit and have retail and other services within walking or bicycling distance. As the Bay Area seeks to accommodate two million people over the next 25 years, it is especially critical that every new unit that is added be well served by transit. Every Bay Area city is expected to do its share of accommodating population growth, and Berkeley is particularly well positioned to do so given its existing high level of transit service.

In fact, a number of Berkeley neighborhoods are living examples of how travel characteristics are affected by land use policies. A comparison of travel behavior in the Bay Area shows that Berkeley households drive significantly fewer miles, and emit 58 percent fewer transportation-related greenhouse emissions, than the average Bay Area household.

When specific areas (called Travel Analysis Zones, or TAZs) in Berkeley are compared, households in zones located near BART stations drive less and are therefore responsible for fewer emissions. For example, residents of Downtown Berkeley emit 84 percent fewer transportation-related GHG emissions than the Bay Area average.<sup>20</sup>

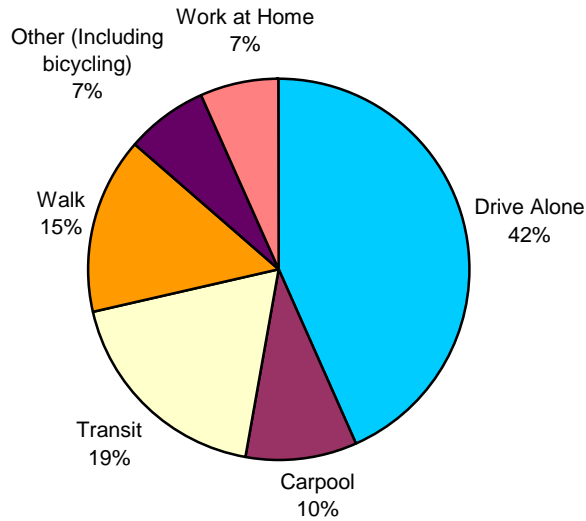
<b>Area/Zone</b>	<b>GHGs per household per year</b>	<b>Savings compared to Bay Area Avg.</b>	<b>% Reduction per household</b>	<b>Tons reduced per 1,000 households per year</b>
Bay Area avg.	6.8 tons	---	---	---
Berkeley avg.	2.9	3.9 tons	58%	3,908
Downtown Berkeley	1.1	5.7	84%	5,709
Ashby BART	2.1	4.6	69%	4,645
N. Berkeley BART	2.7	4.1	62%	4,115

There are a number of important reasons for this. First, for a medium-sized city integrated into a larger metropolitan area, Berkeley includes an unusually high proportion of residents who live close to where they work or go to school. For example, many UC students, faculty and staff live in Berkeley in order to be close to campus. Many of them walk or bicycle to campus and those who drive make mostly short trips. ***In the 2000 U.S. Census, 15 percent of Berkeley residents reported walking to work, compared with just 3.2 percent in Alameda County.***

Second, residents of the Downtown and other relatively compact neighborhoods are able to make at least some shopping and other non-work trips on foot or bicycle, thereby reducing overall automobile use.

<sup>20</sup> MTC Travel Model and Climate Change maps

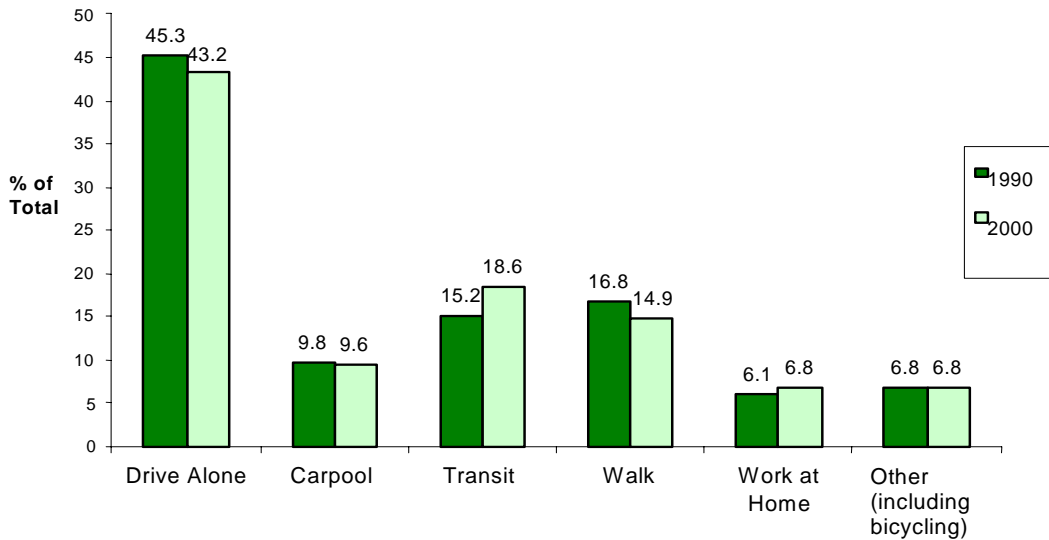
<sup>21</sup> Findings based on data provided by the Metropolitan Transportation Commission



**City of Berkeley Commute Modes, Year 2000**

Finally, a relatively high-proportion of Berkeley residents lives near AC Transit lines or one of Berkeley’s three BART stations, enabling increased mobility without reliance on a car. In 2000 just 42 percent of Berkeley residents reported driving alone to work, compared to 66 percent in Alameda County. Nearly one in five people commute on transit and one in ten carpools.

Such figures are noteworthy. But it is also important to note that Berkeley has not improved its commute mode share markedly since 1990. Clearly, maintaining the status quo will not do if the community is to achieve its voter-approved emissions reduction targets.



**City of Berkeley Commute Mode Share, 1990 and 2000**

## D. SUSTAINABLE TRANSPORTATION & LAND USE ACTIONS

The goals, policies and actions outlined in this section are consistent with and build on existing City of Berkeley plans and policies, including:

- The Berkeley General Plan
- Specific Area Plans (including the draft Downtown Area Plan)
- Bicycle Plan
- Pedestrian Plan (currently in draft form)
- Transit First Policy

Ultimately, the purpose of the policies and actions included in this chapter is to serve as guides for doing what is in the community's power to:

- Reduce vehicle miles traveled in the community and in the region
- Increase vehicle fuel efficiency and the utilization of low-carbon fuels

See Appendix A for a consolidated list of goals, policies and implementing actions, along with an implementation timeline, related to sustainable transportation and land use.

### 1. Goal: *Increase density along transit corridors*

As has been mentioned, an essential component of reducing transportation-related greenhouse gas emissions in Berkeley and in the region is to direct new development to locations that are close to transit and have retail and other services within walking distance (such as the Downtown).

The Association of Bay Area Governments (ABAG) provides regular forecasts for how the nine-county Bay Region and the cities therein are expected to grow. According to ABAG's *Projections 2007*, the total population of Berkeley is expected to grow from 104,400 in 2005 to 119,400 in 2035 – a total increase of 15,000 people, about half the growth rate projected for the region as a whole. The City is expected to increase its housing stock from 45,530 in 2005 to 50,980 during that same period – or an increase of 5,450 units. The projections expect an average increase in housing of about 182 units per year. Jobs are expected to increase from 75,430 to 87,150, or about 11,700 jobs. ABAG is projecting that the average number of workers per household will increase substantially over the projection period, with employed residents increasing from 55,510 in 2005 to 77,450 in 2035 – or about 22,000 new workers living in Berkeley. Although not calculated by ABAG, this means that the average number of workers per household will increase from 1.22 in 2005 to 1.52 in 2035 – very close to the regional averages for both those figures. It is largely because of this increase in workers per household (both here and in the region) that the region's (and Berkeley's) job/housing balance does not substantially worsen over the 30-year projection period. Today, Berkeley has about 20,000 more jobs than employed residents. In 2035, Berkeley is projected to have only 10,000 more jobs than employed residents.<sup>22</sup>

The increase in housing units in Berkeley forecasted by ABAG reflects the significant existing imbalance between jobs and housing in the City, and projected employment growth. The City is also relatively “transit-rich” with four fixed rail stations (BART and Amtrak) and over 20 AC Transit bus routes in a relatively small city.

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<sup>22</sup> ABAG *Projections 2007*. [http://www.abag.ca.gov/planning/research/projections\\_2007.html](http://www.abag.ca.gov/planning/research/projections_2007.html)

Berkeley's job/housing imbalance results in high demand for limited housing and a large number of people driving into the city on a daily basis. About 50 percent of employed Berkeley residents, or 28,000 people, live and work in Berkeley. These 28,000 residents fill 44 percent of the jobs. Thirty-six thousand non-resident commuters fill the remaining 56 percent of Berkeley-based jobs.

The fundamental issue for Berkeley is the cumulative effect of the need to accommodate its portion of the region's growth – especially given the growth of jobs at UC Berkeley and Lawrence Berkeley National Laboratory. With Berkeley's growth in employment, its central location in the region, and its access to transit, our community is likely to be called on over time to accommodate more of the region's residential growth, rather than less. The City must accommodate long-term growth while preserving the essential qualities of the community and achieving our GHG reduction goals.

The most effective strategy for accommodating growth and reducing VMT is to site new development near transit.

Consider the following additional statistics:

- Households in Transit Oriented Developments (TOD) drive 5,000 - 7,500 fewer miles per year,<sup>23</sup> and use transit five times more than households in adjacent locations.<sup>24</sup>
- Office workers use transit 3.5 times more when job sites are in close proximity to transit.<sup>25</sup>
- Rates of GHG emissions have been shown to be 2 to 3.4 metric tons per year per household lower within TOD locations.<sup>26</sup>

Compact development also provides several other benefits, including preservation of forests, open space and farmland by focusing growth in the urban core; providing more opportunities for physical activity like walking and cycling; and reducing costs associated with road construction and other infrastructure.

Clearly, by accommodating more people near jobs, transit and other services, the Berkeley community can play an important role in reducing GHG emissions and maintaining a vibrant, healthy community.

At the same time, many in Berkeley are concerned about the impact of increasing density on neighborhood character and community quality of life. In Berkeley, where transit corridors such as San Pablo, University and Shattuck Avenues are sometimes adjacent to existing lower density residential neighborhoods, design and zoning tools should seek to step down density into the neighborhood, while maintaining or even increasing what is permitted immediately adjacent to the major boulevard. In this manner, impacts on existing neighborhoods can be minimized. It is also imperative that new development is built (or renovated) according to nationally recognized green standards and encompasses requirements and incentives to enhance local green space, conserve natural resources, protect sites of historical significance, and minimize shading of public places. In this way Berkeley can absorb growth in a manner that is not only consistent with stated GHG-reduction goals, but also improves community livability.

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<sup>23</sup> Deborah Dagang and Terry Parker, "Transportation Land Use Strategies to Minimize Motor Vehicle Emissions: An Indirect Source Research Study", California Air Resources Board, 1995.

<sup>24</sup> California Department of Transportation, "Statewide Transit-Oriented Development Study Technical Appendices", 2002.

<sup>25</sup> Lund et al. (2004) "Travel Characteristics of Transit-Oriented Development in California".

<sup>26</sup> California Department of Transportation, "Statewide Transit-Oriented Development Study Technical Appendices", 2002.

**a. Policy: Encourage the development of housing (including affordable housing) retail services, and employment centers in areas of Berkeley best served by transit**

Policies to increase residential and commercial density near transit are already articulated in the Berkeley General Plan, Land Use (LU) chapter. Examples include:

*Policy LU-23 Transit-Oriented Development*

*Encourage and maintain zoning that allows greater commercial and residential density and reduced residential parking requirements in areas with above-average transit service such as Downtown Berkeley.*

*Policy LU-25 Affordable Housing Development*

*Encourage development of affordable housing in the Downtown Plan area, the Southside Plan area, and other transit-oriented locations.*

As well as reducing commute VMT by adding housing near transit, the community can do more to reduce the number and length of shopping trips that require driving. While residents are able to meet some of their needs in local commercial districts, Berkeley lacks stores in significant categories like consumer electronics, appliances, men's clothing, and, in some areas, grocery stores. Filling gaps in retail demand can help reduce the need for Berkeley residents to drive to shopping malls in Emeryville, Walnut Creek, or other cities.

Locating compact residential development and neighborhood-serving retail development along the same transit corridors represents an integrated strategy for reducing VMT and increasing other mobility options. More retail options provide residents, workers, and transit riders with more convenient access to services, while more residents and workers translate into more customers for local stores and services. Further, adding affordable housing and residential-serving retail in Berkeley's most transit-accessible corridors also has the potential to provide low-income households with convenient access to transportation and other services without having to own a car.

**Implementing Actions:**

- *Conduct a "land use scenario study" in order to help visualize, quantify, and compare the impacts on VMT (and the associated GHG and local air pollutant emissions) of various land use scenarios. The study should focus its analysis on corridors within Berkeley that are best served by public transit and/or have the potential to be transit-served corridors in the future. The study should also help to identify and prioritize additional opportunities to create/expand green space within the city.*
- *Implement zoning adjustments to facilitate a mix of housing and commercial development (including retail services and employment centers) in certain transit-served areas, including:*
  - *Encourage car-lite (e.g., households with fewer cars than driving-age residents) and, where possible, car-free (e.g., households without cars) development in certain transit-served areas by creating incentives and eventually requiring developers and business owners who work with the City, AC Transit, BART and other appropriate agencies to develop and implement a plan of action for reducing the impact of their development/business on VMT*
  - *Encourage car-lite and/or car-free development in certain transit-served areas by making parking requirements more flexible for developers and business owners that site near transit and that provide services, infrastructure and/or mitigation payments to reduce parking demand. Options a developer/business owner could provide in lieu of providing parking spaces may include:*

- Car share parking
  - Indoor and outdoor bicycle parking
  - Indoor showers and changing rooms for cycling employees
  - Dedicated parking for electric vehicles, hybrids and plug-in hybrids
  - Implementation of an Eco-Pass program for employees/tenants
  - Mitigation payments that would be allocated to local transportation demand management projects
- Establish parking maximums in specified transit-rich areas of the City.
- Adjust zoning to allow for greater residential density and specified commercial uses along certain transit corridors and in proximity to the Downtown Berkeley, Ashby and North Berkeley BART stations
- Establish minimum building heights in certain transit-rich areas such as the Downtown in order to prevent the underutilization of transit-served areas
- Ensure that dense transit-served corridors transition well into surrounding lower density residential zones in order to preserve the character of interior neighborhoods
- Increase current bicycle parking requirements for new development in Berkeley
- Reduce the minimum lot size for construction of an accessory dwelling unit within a ¼ mile of selected transit lines in order to encourage more construction of these units
- Remove some of the restrictions on Accessory Dwelling Units near certain transit nodes. These might include reduced parking requirements, increased size limits, or increased allowed densities
- *In order to improve livability and reduce VMT in existing neighborhoods that **are not** well served by transit, consider where in-fill neighborhood-serving retail, that is oriented to basic daily needs such as “corner stores” and small markets, may be feasible.*
- *Develop tools and guidance that the Zoning Adjustments Board (ZAB), Planning Commission and City Council can utilize in order to effectively consider and reduce the impact on GHG emissions of a given land use-related proposal. Examples include:*
  - Provide guidance and tools to the ZAB and Planning Commission that would help to guide the process of reviewing a given proposal based on the impact the proposal would have on local and regional GHG emissions. The guidance and tools would help the ZAB to consider the impact on GHG emissions of a given proposal when administering the “non-detriment finding.” This guidance would reflect City Policy on the importance of reducing greenhouse gas emissions
  - Require that any changes that result in “down-zoning” in certain areas in proximity to transit undergo a thorough review for impact on local and regional GHG emissions
- *Partner with UC Berkeley to assess and address unmet housing demand of UC employees. UC Berkeley is the largest employer in the City of Berkeley and therefore has a substantial impact on community VMT. The high cost and high demand for housing means that many UC employees and faculty are unable to live in Berkeley. UC could do more to address those housing needs. Some institutions directly address this issue by either developing housing themselves, subsidizing others to do so, or through direct housing assistance to employees.*
- *Partner with UC Berkeley and the Berkeley Unified School District to identify opportunities to site affordable housing near transit for faculty and staff.*

- *Provide enhanced assistance during the permit process for transit-oriented development projects.*
- *Encourage the adaptive reuse and intensification of historic buildings in proximity to transit, when feasible and appropriate.*

**2. Goal: Increase and enhance urban green and open space, including local food production, to improve the health and quality of life for residents, protect biodiversity, conserve natural resources, and foster walking and cycling**

Green and open spaces are essential components of Berkeley’s livability, public health and ecological sustainability. Safe and inviting public parks, vibrant community gardens, and high-quality street design help to foster physical activity (and low-carbon mobility) such as walking and cycling. Well-designed open spaces can also serve as parts of an advanced and integrated stormwater system that promotes stormwater quality and reduces downstream flooding. Utilizing natural systems to manage water resources also has the potential to reduce the need for more energy and carbon intensive stormwater infrastructure projects. Further, Berkeley’s parks, gardens and streetscapes can be designed to conserve shrinking water resources by utilizing drought-resistant plants and water-efficient irrigation techniques.

**a. Policy: Require new developments in specified areas to contribute to street-level open space on site or in the public realm**

**Implementing Actions:**

- *Establish an “Open Space Fee” or similar mechanism for the creation of new and enhancement of existing streetscapes, public open space, and community gardens.*
- *Allow multi-unit residential projects to provide street-level public open space in lieu of some required on-site private open space.*

**b. Policy: Promote tree planting, landscaping, and the creation of green and open space that is safe and attractive and that helps to restore natural processes**

A healthy urban forest has several benefits, including:

- Reducing the energy consumption associated with air conditioning buildings by providing shade
- Reducing local ambient temperatures by shading paved and dark colored surfaces like streets and parking lots that absorb and store energy rather than reflecting it
- Intercepting and storing rainwater, thereby reducing water runoff volume
- Improving community quality of life through beautification and by reducing noise pollution and encouraging pedestrian traffic

Trees also provide a GHG reduction benefit through a process called carbon sequestration. A single mature tree can absorb as much as 48 lbs. of carbon dioxide per year. Estimates are that between 660 and 990 million tons of carbon is stored in urban forests nationally.<sup>27</sup>

**Implementing Actions:**

- *Maintain and protect mature trees wherever possible and maximize tree planting as part of public open space and street improvements.*
- *Consider developing street tree master plans for sub-areas within the City. Such plans would guide the selection of appropriate tree species for streets and open spaces and outline a regular*

<sup>27</sup> Alexander, Katherine. *Benefits of Trees in Urban Areas*. [www.coloradotrees.org/benefits.htm](http://www.coloradotrees.org/benefits.htm).

maintenance and planting cycle to ensure that hazards to trees are minimized and that the local tree stock continues to increase.

- *Identify opportunities for tree planting and to maintain existing and create new public open spaces in order to increase community access to parks and plazas.* The City should ensure that as development increases along certain transit corridors it is accompanied by an appropriate level of tree planting and green and open space enhancements.
- *Establish standards and guidelines to ensure that ecologically beneficial stormwater quality and retention features and water conservation features are integrated into the design of landscaping features on both public and private land.*
- *Encourage the development of green roofs by providing outreach and guidelines consistent with the building code.*

**c. Policy: Increase access to healthy and affordable foods for the community by supporting efforts to build more complete and sustainable local food production and distribution systems**

The “Victory Garden” movement during World War I and World War II turned the U.S. into a nation of gardeners. This was a time of crisis in which the federal government asked citizens to plant gardens to reduce pressure on the food supply brought on by war. In 1943, Americans planted over 20 million Victory Gardens and the harvest accounted for nearly a third of the vegetables consumed in the country that year.<sup>28</sup>

Today gardening and a growing local food movement are again making a comeback. Communities’ desire to cut costs, eat healthier, and reduce their carbon footprint, along with concerns about our food system’s dependence on rapidly depleting fossil fuels, is spurring a move toward more sustainable food production and distribution.

Sustainable food systems reduce the distance food must travel to get to our tables. When food is produced, processed and distributed near where it is consumed, transportation miles are minimized as well as are the associated pollutants. According to a WorldWatch Institute study, a typical meal brought from a conventional supermarket chain consumes 4 – 17 times more petroleum for transport than the same meal using local ingredients.<sup>29</sup> Despite California’s massive food production capacity, the state imports 40 percent of its food, which translates into at least 250,000 tons of GHG emissions per year, according to an NRDC study.<sup>30</sup>

Sustainable food systems also prioritize the consumption of organic food over conventional food, and the consumption of vegetables rather than meat. Organic food production requires far less fossil fuel inputs than conventional systems, which in turn reduces GHG emissions. Likewise, a meat diet requires twice as much energy to produce as a vegetarian diet.<sup>31</sup> Globally farm animals generate 18 percent of GHG emissions, according to estimates by the United Nations.

Local food systems offer a host of social and economic benefits as well. For example, growing a garden can make a difference for a family’s food budget. And efforts to increase access to local, affordable, healthy food for low-income families, the elderly, and others with mobility challenges can improve

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<sup>28</sup> See [www.revivevictorygarden.org](http://www.revivevictorygarden.org) (2009)

<sup>29</sup> Hal Walweil, “Home Grown: The Case for Local Food in a Global Food Market.” WorldWatch Institute, 2002.

<sup>30</sup> NRDC Policy Fact Sheet, “Food Miles: How Far Your Food Travels has Serious Consequences on your Health.” NRDC, 2007.

<sup>31</sup> Heller, M.C. and G.A. Keoleian. *Life Cycle-Based Sustainability Indicators for Assessment of the U.S. Food System.* 2002.

public health. Local food systems also help to insulate communities from volatile oil prices, which in turn affect food prices. Finally, food localization can create high-quality local green jobs in the farming, food processing and distribution trades.

The City of Berkeley already has a foundation on which to build when it comes to promoting local, nutritious food. The City Council adopted a Food and Nutrition Policy in 2001. Its purpose is to “help build a more complete local food system based on sustainable regional agriculture that fosters the local economy and assures that all people of Berkeley have access to healthy, affordable, and culturally appropriate food.”<sup>32</sup> Examples of how this policy is currently being implemented include the City’s financial and logistical support of community gardens and the City has also included local food criteria in Requests for Proposals (RFP) for vendors to prepare and deliver food for the City of Berkeley Summer Food Program.

In response to crises like climate change, Peak Oil, health disparities, a shaky economy, and the loss of greenfields and farmland due to suburban sprawl, the City and its partners must do more to build a resilient and sustainable local food system.

### **Implementing Actions:**

- *Encourage and support existing community gardens as well as neighborhood initiatives to launch additional community gardens.*
- *Include community gardens and orchards in the planning for the Santa Fe Right-of-Way.*
- *Encourage local community gardens to donate excess produce to local food banks.*
- *Continue to provide compost to community and school gardens.*
- *In collaboration with local business associations and merchants, continue to expand and promote the **Buy Local Berkeley Campaign**. The goal of the campaign is to build a vibrant local economy by encouraging consumers and businesses to buy local. Shifting more consumer purchases to local businesses has the potential to increase tax revenue for the City, expand local investments in non-profits and local businesses, and create more local jobs while simultaneously reducing vehicle miles traveled.*
- *In partnership with business associations and others, create incentives for restaurants that feature local, organic foods. Incentives could include marketing and promotion assistance, among others.*
- *Support local educational institutions such as the Berkeley Unified School District, the Berkeley Adult School and UC Berkeley to continue educating students in growing and preparing their own food. Nearly all of the Berkeley Unified School District’s (BUSD) schools have gardens, several of which produce food for school consumption. Through garden and cooking classes, students are introduced to food production, nutrition, composting, and ecological awareness.*
- *Promote the purchase of food from local producers for schools, senior centers, after-school programs, the summer food program and others. This action can be carried out by including local and nutritious food criteria in Requests for Proposals for vendors to prepare and deliver food for such programs. Currently 30 percent of the produce BUSD serves to students is sourced locally.*
- *Support state and federal legislation that prioritizes local food production.*

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<sup>32</sup> The City of Berkeley Food and Nutrition Policy is available at:  
<http://www.ci.berkeley.ca.us/PUBLICHEALTH/chronicdisease/food-policy-exhibit-a925.pdf>

- *Continue to make street space available for farmers markets and explore opportunities for additional markets in Berkeley so as to increase access to local, healthy food.*
- *Encourage and provide guidelines consistent with the building code for buildings to incorporate rooftop gardens that can be used for food production.*
- *Through the City's website and publications, encourage residents to grow food in home and community gardens using methods that reduce GHG emissions, such as using organic inputs and compost.*
- *Support local efforts to provide training to residents in farming and gardening techniques.*
- *Identify opportunities to open up City-owned vacant land to encourage local food production for local consumption.*
- *Support the development of local food distribution and processing facilities. The City can provide this support in several ways, including: utilizing procurement dollars and City contracts to support local green businesses and providing marketing assistance.*
- *In collaboration with AC Transit, identify opportunities to improve public transportation options to local food markets.*
- *Work with community partners to identify methodologies for better tracking and reporting on the rate of local food production and consumption and the associated cost and GHG impacts, and other indicators.*

**3. *Goal: Manage parking more effectively to minimize driving demand and to encourage and support alternatives to driving***

- a. **Policy: Design and implement parking strategies to create disincentives for driving - especially for single-occupancy commuting – and, where possible, to build revenue for transportation services.** Such services may include:
- Expansion of car sharing
  - Improved bicycle infrastructure
  - Bicycle-sharing programs
  - Sidewalk repair and other pedestrian improvements
  - A local shuttle bus network

**Implementing Actions:**

- *Work closely with UC Berkeley, the City's largest employer, to design parking policies and programs that encourage and support alternatives to driving while at the same time maintaining ample access to retail, commuter, and visitor destinations.*
- *Identify areas in Berkeley in which increased parking rates would effectively discourage driving and generate new revenue while not having a significant negative effect on local businesses. Such neighborhoods should be well served by alternative transportation options.*
- *Identify areas in Berkeley in which extending parking meter hours of enforcement would effectively discourage driving and build new revenue while not having a significant negative effect on local businesses.*
- *Consider the establishment of Parking Benefit Districts, which would receive a portion of parking revenues generated in the area.*

- Evaluate the feasibility and efficacy of redesigning the Residential Preferential Parking (RPP) Program so as to apply it citywide (in every neighborhood) and utilize the revenue to design programs and infrastructure that make alternative transportation options more accessible, convenient and attractive.
- Structure RPP permit costs so that each additional permit acquired by a given household escalates in cost.
- Consider setting RPP permit prices based on the fuel efficiency of the vehicle for which the permit is being acquired.
- Install RPP permit holder-exempt parking meters in some RPP zones.
- Make on-street parking rates equivalent to or higher than off-street (parking lot) parking rates.
- Raise on- and off-street parking rates as appropriate.
- Consider putting an increase to the City's 10 percent tax on off-street parking revenue on the ballot.
- "Un-bundle" prices for housing and parking so that parking spaces require separate payment and are not included in the rent or purchase price of a unit. Those who choose to live car-free should not be burdened with the cost of a parking space they do not need. And those that do require a car should be made aware of the full costs associated with owning it.
- In certain popular destinations such as the Downtown, employ parking information signage to direct motorists to available off-street parking. This action minimizes idling and motorists' need to drive around in search of an open spot.
- Ensure that local employers are abiding by state requirements to participate in the parking cash-out program. State law requires certain employers who provide subsidized parking for their employees to offer a cash allowance in lieu of a parking space. The intent of the law is to reduce vehicle commute trips and emissions by offering employees the option of "cashing out" their subsidized parking space and taking transit, walking, cycling, or carpooling to work instead.
- Except in cases where certain City staff persons have no alternative to driving to and from work (e.g., emergency personnel who work overnight), phase out free parking assigned to City staff for privately owned vehicles.

**4. Goal: Identify opportunities for generating sustained revenue for implementing community transportation demand management programs**

- a. Policy: Create additional strategic fees/taxes in order to build revenue for transportation demand management (TDM) efforts and to further discourage driving alone**

**Implementing Actions:**

- Institute a "Transportation Services Fee" for new development and utilize funds in part for alternative transportation programs that reduce vehicle trips and traffic congestion.
- Institute an "In-Lieu Parking Fee" on new development and utilize funds in part for alternative transportation programs that reduce parking demand.
- Conduct a feasibility analysis of a City of Berkeley "congestion pricing" program. Congestion pricing is the practice of charging motorists to use a given roadway during times of heaviest use. Its purpose is to ease traffic congestion and promote alternative forms of transportation.

- *Support development of a regional “climate mitigation fee” applied to either gasoline or vehicle registration.* The revenue would be used to support public transportation and other transportation demand management efforts.

## 5. **Goal: Accelerate Implementation of the City’s Bicycle & Pedestrian Plans**

The City of Berkeley is already a recognized leader for its efforts to make walking and cycling a safe, healthy and enjoyable alternative to driving. Our community ranks as the safest of its size in California for walking and bicycling and recently won the National Organization on Disability’s Accessible America Competition.

Continued enhancement of the City’s cycling and walking infrastructure is a longstanding City priority. The City emphasized the importance of a robust cycling network in its 1977 Master Plan and has since adopted and updated a Berkeley Bicycle Plan (last updated in 2005). The City is also currently completing the first citywide Pedestrian Master Plan. These plans are comprehensive blueprints for making alternatives to the automobile more comfortable and safe, thereby encouraging people to shift from driving and toward making trips by bicycle or by foot. The plans seek to address bicycle and pedestrian safety, improvements in the community’s bicycle and pedestrian infrastructure and more.

In 2003, Berkeley established a citywide network of Bicycle Boulevards. Bicycle Boulevards use large pavement markings, attractive signs, traffic calming, and other improvements placed on a convenient, evenly-spaced network of low-traffic, low-speed streets throughout the city.

As of 2000, about 15 percent of Berkeley residents commuted to work on foot and about five percent commuted by bicycle. Getting more people to leave their car at home for both work and non-work trips is a fundamental component of achieving Berkeley’s greenhouse gas emissions reduction goals.

For example, the Berkeley Bicycle Plan sets a goal of doubling the share of bicycle commuting from five percent to 10 percent (as a reference, the City of Davis, CA has a bicycle commute mode share of nearly 15 percent despite the fact that the city is less compact than Berkeley).

City staff estimates that achieving a five percent increase in bicycle commute mode share plus a doubling of the share of non-work commute trips made by bicycle would result in a reduction of over 2.5 million vehicle miles driven annually. This equates to a 1,157 metric tons reduction in GHG emissions annually.

### a. **Policy: Continue to expand and improve Berkeley’s bicycle and pedestrian infrastructure**

#### **Implementing Actions:**

- *Integrate bicycle boulevards and pedestrian networks into broader alternative transportation system and identify mobility gaps that could be addressed through additional bicycle/pedestrian infrastructure.* Additional infrastructure could include bicycle lanes and boulevards, signage showing distance to various destinations, sidewalk lighting, etc. Explore funding from such programs as the “Safe Routes to Transit” program for this purpose.
- *Extend Bicycle Boulevard network.* For example, construct an extension on the 9<sup>th</sup> Street Bicycle Boulevard.
- *Improve cross-jurisdictional bicycle route connections through signage, bikeway route modification where warranted, and physical improvements.*

- *Identify opportunities to modify City streets to better serve the safety and needs of pedestrians and cyclists.* Street modifications that serve to slow or reduce automobile traffic and make walking and cycling more safe and viable include traffic circles and allocating additional roadway space to cyclists. The City should develop and adopt “Complete Streets” design standards, and routinely accommodate bicycle and pedestrian improvements in all streets and sidewalks projects.
- *Replace stop signs with yield signs at traffic circles on bicycle boulevards.* Many Berkeley cyclists see the stop signs as unnecessary and inconvenient given that the traffic circles already effectively slow automobile traffic, and are designed to function as “all-yield” intersections.
- *Continue to create additional bicycle parking throughout the community, including near transit centers and other key destinations and as part of any new development projects.* Since 1996, the City has installed more than 500 bicycle racks, supported the installation of electronic bicycle lockers at BART and rail stations, and helped to establish the Downtown Berkeley BART Bike Station. In 2008-09, the City plans to add approximately 350 new on-street bicycle racks, with a capacity for 700 bicycles. BART has bicycle storage at the Ashby BART Station, and an expanded Downtown Bike Station is under consideration.
- *Provide adequate sidewalk width, pedestrian crossing time, “count down” signals, and universal access signal features at all signalized crosswalks.*
- *Evaluate the need for new mid-block pedestrian crosswalks where there are high volumes of pedestrians and a long distance between intersections.*
- *Regularly update the Bicycle and Pedestrian Plans, including updating indicators of pedestrian and cyclist safety.*
- *Consider establishing a network of bicycle rental stations.* As a first step, conduct a feasibility analysis to help identify program design, costs and funding options. Bike-sharing programs implemented in other parts of the world have proven to be effective. In Paris, for example, a network of automated bicycle rental stations is placed within a few hundred yards all over the city. Bicycles can be borrowed and used for short trips for a small fee. A much smaller scale program was established in Washington, D.C. in 2008, and a number of other U.S. cities are studying or developing bike-sharing programs.

**b. Policy: Partner with local and regional organizations and agencies to promote and market cycling and walking as attractive alternatives to driving**

A number of local and regional agencies and organizations are already dedicated to promoting cycling, walking and other alternative forms of transportation. Examples include:

- Sierra Club
- Bicycle Friendly Berkeley Coalition
- East Bay Bicycle Coalition
- The Berkeley Path Wanderers Association
- TransForm (formerly known as the Transportation and Land Use Coalition)
- BART
- AC Transit
- Alameda County Transportation Improvement Authority
- Alameda County Congestion Management Agency
- Metropolitan Transportation Commission
- Bay Area Air Quality Management District
- Livable Berkeley

- Berkeley Design Advocates
- Greenbelt Alliance
- Urban Land Institute

It is important to leverage existing outreach efforts when working to increase the mode share for cycling and walking in Berkeley.

**Implementing Actions:**

- *Secure marketing firm to design a community-wide marketing campaign to increase the mode share of bicycles and walking (and other forms of alternative transportation). The campaign should succeed at encouraging and educating residents and employees regarding how to meet their mobility needs in a safe, healthy and fun way without driving a car.*
  - *Enhance bicycle and pedestrian safety outreach and education for cyclists, walkers and drivers. For example, the City of Berkeley’s Public Health Division, along with other City divisions, should continue to provide safety education and promotion of cycling and walking. Partners in this effort include the California Office of Traffic Safety, the Alameda County Safe Routes to School Program, and International Walk to School Day.*
  - *Promote participation in such bicycle promoting events as Bike to Work Day.*
  - *Promote the use of bicycle delivery services and bicycle cargo trailers to local businesses and residents.*
- c. **Policy: Partner with BART, AC Transit, and other transit providers to improve bicycle access on trains and buses and at stations and stops**

Improvements to bicycle access on BART, AC Transit, UC and LBNL shuttles and at transit stations and bus stops can help reduce car trips by making the combining of cycling and transit a more viable and convenient travel option.

**Implementing Actions:**

- *Expand and improve secure bicycle parking at all Berkeley BART stations and bus stops.*
- *Increase the capacity for bicycles on BART trains by removing some seats and making other changes to select cars.*

d. **Policy: Continue to incorporate bicycles into municipal operations**

**Implementing Actions:**

- *Maintain and expand the Bicycle Fleet Pool available for City employees and encourage more City staff persons to take advantage of it.*
- *Continue to provide secure bicycle parking near City Hall and other city employment sites.*
- *Consider other bicycle fleet programs such as electric bicycles, cargo bikes, and mileage reimbursement for employee’s personal bicycle use for work trips.*

6. **Goal: Make public transit more frequent, reliable, integrated and accessible**

The choice to use transit over a private automobile is dependent on many variables, including: reliability, frequency of service, cost, travel time, perceived safety, and comfort. Improvements in any one of these factors can increase transit ridership.

High-density, transit-rich cities experience significant reductions in private automobile use. A study by John Holtzclaw of the Sierra Club found that, in San Francisco, a reduction of nine vehicle miles traveled is achieved for every passenger mile of transit service.<sup>33</sup> Other research shows that the total effect of public transportation nationwide is to reduce energy use in the transportation sector by the equivalent of 4.2 billion gallons of gasoline per year. Public transportation reduces GHG emissions from automobile travel by 37 million metric tons per year. For perspective, to achieve parallel savings by planting new forests, one would have to plant a forest larger than the state of Indiana.<sup>34</sup>

Berkeley is lucky to have generally excellent transit choices, with three BART stations, more than 20 AC Transit routes, numerous shuttles (UC, LBNL, Alta Bates, West Berkeley Shuttle), Capitol Corridor/Amtrak, as well as paratransit, private shuttles, and taxis.

In 1996, Berkeley adopted a Transit First Policy (Resolution 58,731), which states, “It shall be the official Policy of the City of Berkeley that alternative transportation and public transit be given preference over single occupancy vehicles on designated preferential transit streets.”

As of 2000, about 20 percent of Berkeley residents used BART or the bus for their work commute. Increasing this percentage requires working closely with AC Transit, BART and community-based organizations to ensure that fares stay low or get lower, more frequent service and more routes are added, and that the safety and comfort of the transit systems are improved. Efforts must also be made to increase the use of transit for non-work trips.

**a. Policy: Partner with AC Transit to expand and enhance AC Transit bus service in Berkeley**

**Implementing Actions:**

- *Integrate bus routes into broader alternative transportation system, identify gaps in bus service routes and potential scenarios for addressing such gaps, and improve frequency and reliability of bus service where required.*
- *Improve access to public transportation in the Berkeley hills.* Options include shuttle buses, on-demand transit, and more frequent and expanded AC Transit bus service.
- *Encourage more efficient payment systems such as “proof of payment” and level boarding to speed bus transit service.*
- *Ensure that transit buses are fuel-efficient, utilize alternative fuels, and are appropriately sized.*
- *Install real-time transit signage at bus stations and stops.* Knowing when the bus will arrive significantly improves the user-friendliness of the system by lowering the anxiety and uncertainty around waiting. Real-time, multi-route departure signs were installed in the BART Plaza and at the northeast corner of Shattuck and Center Streets in 2008. Real-time have been installed at all the 72R Rapid Bus stops on San Pablo, and are being installed on the 1R Rapid Bus stops on Telegraph and Shattuck. The City can work with AC Transit increase the number of real-time signs at bus stops. Further, real-time transit information should be made available through communication technology, such as the Internet and mobile phones.

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<sup>33</sup> Sharon Feigon, *Transit Matters: Mitigation Climate Change with Sustainable Surface Transportation*, U.S. Federal Transit Administration, Transportation Research Board, 2003.

<sup>34</sup> Bailey, Linda; Patricia L Mokhtarian, Ph.D., and Andrew Little. *The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction*. Submitted by ICF International. 2008.

- *Install and improve bus shelters and benches, and ensure that they are safe, well lit, and well maintained.*
  - *Improve bus flow by removing certain stop signs and on-street parking spaces, by timing signals, and by creating “queue-jumper” lanes where delay occurs regularly. These and similar recommendations are included in the Line 51 Transit Service and Reliability Study and the Line 1R Transit Service and Reliability Study. The City should work with AC Transit to implement the recommendations included in these studies.*
  - *Work with AC Transit and BART to implement the recommendations of the South and West Berkeley Community Based Transportation Plan, which calls for transit service to meet MTC “Lifeline” service standards in low-income areas.*
  - *Enhance sustainable mobility options for seniors and the disabled by providing “universal access” level boarding (e.g., roll-on/roll-off boarding for wheelchairs) on buses and shuttles that easily accommodates wheelchairs, walkers, and other individuals with mobility impairments.*
- b. Policy: Partner with AC Transit, BART and other community stakeholders to consider opportunities for Bus Rapid Transit or light rail systems along certain major transportation corridors (e.g., San Pablo and University Avenues and the Telegraph Ave./Downtown route currently under consideration)**

AC Transit has established "Rapid Bus" lines along San Pablo Avenue (72R) and Telegraph/Shattuck Avenues (1R). AC Transit has also released a Draft Environmental Impact Report (DEIR) for the proposed East Bay Bus Rapid Transit (BRT) system from San Leandro to Downtown Berkeley. In Berkeley, BRT would operate on Telegraph Avenue to the UC campus and then terminate in Downtown. The BRT proposal includes dedicated bus lanes and raised stations to make buses more reliable and efficient, especially given projected increases in congestion on most major streets.

**Implementing Actions:**

- *Continue timely assessment and development of proposed East Bay Bus Rapid Transit (BRT) system. According to the project’s Draft Environmental Impact Report released in 2007, BRT would be faster and more reliable than the existing bus line and is projected to draw over 9,000 additional boardings per day by 2025. This is important given the expected significant increase in the Bay Area’s population (and associated traffic congestion) in that same time period. Further, travel corridors served by BRT could provide opportunities for transit-oriented development and streetscape improvements.*

BRT also has some potentially significant impacts that must be addressed, generally related to the loss of traffic lanes and parking for private automobiles. AC Transit plans to propose mitigations for potential negative impacts as part of its Final Environmental Impact Report.

- c. Policy: Partner with BART to expand and enhance BART service in Berkeley**

**Implementing Actions:**

- *Improve the pedestrian, cyclist and transit connectivity at the Downtown Berkeley BART station by implementing the Downtown BART Plaza and Transit Area Design Plan.*
- *Extend service hours and provide direct service from Berkeley to San Francisco in the evenings.*
- *Work with BART to install solar electric systems on Berkeley BART stations.*

**d. Policy: Partner with AC Transit, BART, UC Berkeley and other employers to provide subsidized transit passes and fare-free zones**

Cost and convenience of payment are key factors that affect people's mobility choices. The lower the perceived cost, the more likely community members will choose a given form of transportation. As such, providing free or heavily subsidized universal transit passes (e.g., Easy Pass) and/or free-fare zones have the potential to serve as effective strategies for increasing transit ridership and reducing single-occupancy driving.

Since 2003, City of Berkeley staff has received free AC Transit bus passes as part of their benefits package. These "Easy Passes" (formerly Eco Passes) are used for more than 48,000 rides per year. UC Berkeley students also participate in a Class Pass transit pass program. Students are assessed an annual fee and receive unlimited AC Transit bus rides. UC Berkeley also offers employees a deeply discounted Bear Pass. Most recently, Berkeley City College established a student Easy Pass program.

City staff estimates that providing free bus passes to *everyone who works in Berkeley* would result in a reduction of 5.7 million miles of driving per year, and an annual reduction of over 2,500 MTCO<sub>2</sub>e. This equates to about three percent of the 2020 emission reduction target.

Providing free bus passes to *all employed residents* in Berkeley is estimated to reduce 4.6 million miles of driving per year, and over 2,000 MTCO<sub>2</sub>e. This equates about two percent of the 2020 emission reduction target.

Actions to reduce the cost of traveling by bus and other forms of transit would not only reduce GHG emissions by reducing car trips, but it would also serve as an important travel subsidy for low-income families and those without access to an automobile.

Regional and State government expenditures should be reprioritized so that fares for all public transit can be significantly reduced and, in some cases, eliminated.

**Implementing Actions:**

- *Conduct a Citywide Mobility Study that analyzes the feasibility, efficacy, design, and benefits of providing free bus and BART passes, fare-free zones, and/or shuttles for individuals who live, work, and/or study in Berkeley.* The study will include an analysis of potential funding options to support improved and affordable transit, such as parking revenues, a special tax and other options.
- *Negotiate conditions of approval for all new residential multi-family developments to provide free or subsidized transit passes for tenants.* Incentives can include reduced parking requirements for projects served by transit.
- *Provide incentives for and eventually require all businesses to provide free or subsidized transit passes for employees.*
- *Study feasibility of providing fare-free zones in specified travel corridors or citywide.* This action is dependent upon the reprioritization of state and regional funding mentioned above.
- *Encourage and eventually require all eligible Berkeley employers to enroll in the Alameda County Congestion Management Authority Guaranteed Ride Home Program.* The program guarantees participants who use alternative forms of transportation a ride home if unexpected emergencies occur (i.e., family illness, unexpected overtime, etc.). This offer eliminates one of the often-cited reasons that people drive rather than take transit. In 2008, the Downtown Berkeley Association

established a pilot program to offer the Guaranteed Ride Home program to employers with fewer than 75 employees.

**e. Policy: Expand and integrate community shuttle bus networks**

**Implementing Actions:**

- *Partner with BART, AC Transit, Bayer, Wareham Properties, UC Berkeley, LBNL, Alta Bates and others to design an integrated short-route shuttle bus system, including feeder or 'last mile' shuttles or bus service that would help customers access BART without driving. A shuttle network should be designed to address transit gaps and to better connect key destinations.*
- *Continue to enhance mobility options for people with disabilities by expanding existing paratransit, car share, and taxi services.*

**f. Policy: Encourage additional passenger rail service and ridership in Berkeley**

**Implementing Actions:**

- *Pursue joint marketing strategies with Capital Corridor/Amtrak to promote trains as a convenient form of transportation (include in broader alternative transportation marketing campaign).*
- *Improve bicycle and pedestrian access to passenger rail line, including installing additional signage.*

**g. Policy: Continue to partner with relevant agencies to establish a ferry service to San Francisco and other locations**

**Implementing Action:**

- *Expand bus and other transit service to any ferry terminal established at or near the Berkeley Marina so that there is consistent, coordinated, reliable transit service in conjunction with the ferry. Couple with this action a parking strategy that discourages driving and long-term parking at any future ferry terminal and encourages using an alternative to the personal vehicle to reach the terminal instead.*

**h. Policy: Support state and regional efforts to launch a high-speed rail system**

The California High-Speed Rail Authority has begun implementation of the 800-mile high-speed train system serving Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County and San Diego. High-speed trains will be capable of maximum speeds of 220 miles per hour with an expected trip time from San Francisco to Los Angeles in 2 hours and 40 minutes. The system is forecast to potentially carry over 100 million passengers per year by 2030.

A \$9.95 billion dollar bond measure passed on the November 2008 ballot with \$9 billion for implementing the high-speed train system and \$950 million for improvements to other rail services that connect to the high-speed train service.

**Implementing Actions:**

- *Encourage state, regional, and local policy makers to support the development of a high-speed rail system that links all major California cities, including connecting service to Berkeley.*

- *Ensure that high-speed rail is fully integrated into existing transit services such as BART and AC Transit.*

## **7. Goal: Enhance and expand car sharing and ridesharing programs**

Increasing the share of drivers that utilize car sharing and/or ridesharing to fulfill their mobility needs is an important piece of Berkeley's mobility management puzzle. Ridesharing reduces GHG emissions by reducing single-occupancy trips. Car sharing reduces GHG emissions because members of car sharing programs tend to drive less than non-members, and because car share program vehicles tend to be newer and more fuel-efficient than the average vehicle.

Berkeley is currently served by two car share organizations, City CarShare and Zipcar. A study of the impact of the City CarShare program found that members use 76 percent less gasoline than non-members, and nearly 30 percent of City CarShare members sold a vehicle since joining. For every 25 households who joined City CarShare, six give up a car.<sup>35</sup>

The City of Berkeley has actively supported local car sharing since 2002 when car sharing was first established here through a grant from the City and two parking spaces in the Berkeley Way parking lot. In 2005, the City went further by establishing an innovative fleet car share program that provides City CarShare hybrid vehicles for City employees during working hours. The vehicles are available to all City CarShare members during evenings and weekends. In 2009 the City is partnering with City CarShare to incorporate a plug-in hybrid vehicle into the City's fleet car share program.

The City has also incorporated car share into the development process by requiring car share parking in the Library Gardens Building and even free car share membership for low-income residents in the David Brower Center/Oxford Plaza. In 2008, the City helped establish the first wheelchair accessible car share van.

In order to estimate the potential GHG reduction benefits of an expanded car share presence in Berkeley, City staff developed an expansion scenario in which Berkeley adds 500 additional car share vehicles by 2020. Although approximate, the estimate shows that if each vehicle serves 15 new members, an additional 500 vehicles would serve 7,500 more Berkeley residents than today, remove 3,500 cars from the city, and reduce GHG emissions by approximately 9,300 metric tons per year. This reduction equates to about 10 percent of the 2020 reduction target.

While it is unknown whether market demand would support 500 more car share vehicles in Berkeley, it is possible that widespread availability of shared cars would lead to a convenience "tipping point," where availability and locations grow to a point that many people feel they can give up their privately owned vehicle without sacrificing mobility.

As well as working to expand car sharing, the City also actively encourages ridesharing. The City offers deeply discounted carpool and vanpool monthly parking permits (\$45 per month vs. \$150 per month for single-occupancy vehicles) and promotes the ridematching services provided through 511.org. Commuters who share a ride to work also benefit from High Occupancy Vehicle (HOV) lanes and free bridge tolls in the region.

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<sup>35</sup> Cervero, Robert and Tsai, Yuhsin, *San Francisco City CarShare: Second-Year Travel Demand and Car Ownership Impacts*. July 2003.

Nevertheless, it has proven difficult to increase the share of commuters ridesharing to work in Berkeley. Berkeley ranks 104<sup>th</sup> out of 159 cities in the region for carpooling.

The University of California Transportation Center is currently evaluating the feasibility of a Dynamic Ridesharing program for UC Berkeley employees, whereby faculty and staff would be able to log onto an Internet site to find others needing or offering a ride to or from a nearby location at a similar time. There are also a number of new private firms offering ridematching services to employers, event producers, and online social networks.

**a. Policy: Make car sharing convenient and available to all Berkeley residents by providing additional incentives and by removing disincentives to car sharing**

**Implementing Actions:**

- *Require that developers of new residential and commercial projects of a certain size (to be specified) make spaces available for car share vehicles (provide decreased parking requirements in return).*
- *Enhance outreach to promote increased car sharing (include in broader marketing effort).*
- *Integrate car share pods into broader mobility system by placing more car share pods adjacent to the existing transit network and in neighborhoods underserved by public transportation.*
- *Designate on-street parking spaces for car share vehicles.*
- *Encourage car share companies to site vehicles in private driveways by modifying current business license and zoning requirements.*
- *Provide car share subsidies for low-income residents.*

**b. Policy: Provide incentives and remove disincentives to ridesharing**

**Implementing Actions:**

- *Market existing discounted parking for carpools and vanpools and site such parking spaces near transit when feasible.*
- *In collaboration with community partners, include existing web and phone-enabled ridesharing programs in comprehensive marketing and outreach effort. Telephone and computer technologies currently exist that enable the development of real-time, or dynamic, ridematching. Dynamic ridesharing can match passengers with drivers for individual ad-hoc trips as opposed to regularly scheduled trips.*
- *In collaboration with community partners, market and enhance existing casual carpool program.*

**c. Policy: Expand capacity and service of local taxi fleets to provide an alternative to single-occupancy driving**

**Implementing Actions:**

- *Integrate information about the role of taxi service in marketing and outreach efforts.*
- *In collaboration with regional agencies and local taxi companies, consider studying the feasibility of establishing a discounted zone-based fare or flat fees, especially for travel to/from transit stations.*
- *Support shared taxi use, including real-time dispatch and routing.*

## 8. Goal: Encourage the use of low-carbon vehicles and fuels

Relatively speaking, municipal governments have limited opportunity to affect the technological improvements necessary to increase vehicle fuel efficiency and to lower the carbon content of fuels. But as residents, employees, business owners, city officials, students, etc., we affect our community's average fuel efficiency whenever we make a choice regarding the type of vehicle to drive (if we must drive at all). The role of city government and community-based agencies is to promote and provide incentives for low and zero-emissions vehicles as well as create the infrastructure necessary to support low carbon forms of transportation.

The state and federal governments also have an important role to play. For example, the Pavley Bill (AB 1493, became state law in 2002) would require significant fuel efficiency improvements in automobiles sold in California and therefore have a direct impact on community-level greenhouse gas emissions. Under the Pavley Bill, the average motor vehicle in 2020 could be expected to emit approximately 16 percent fewer GHG emissions compared with today's average automobile.

Whether a result of the Pavley Bill, a new piece of state or federal level legislation, or a combination of outreach and incentives at the community level, improved fuel efficiency requirements and the utilization of low-carbon fuels (including electricity) are necessary pieces of the puzzle for our community's GHG reduction targets. However, the City and its partners and citizens must ensure that low-carbon fuels such as bio-diesel are produced in a manner that does not have negative effects on food supply and that is shown to actually create a GHG reduction benefit when analyzed from a lifecycle perspective.

### a. Policy: Create incentives for electric vehicles and plug-in hybrids in the community

#### Implementing Actions:

- *Evaluate opportunities to create additional free parking and charging stations for electric and plug-in hybrid vehicles.* Currently, the City provides an electric vehicle charging station in the Center Street garage and two dedicated on-street parking spaces for electric vehicles near City Hall.
- *Provide incentives in City parking and transportation demand management policies for developers and business owners that provide plug-in locations for electric vehicles and plug-in hybrids.*
- *Include information about electric vehicles in broader marketing campaign.*

### b. Policy: Provide leadership in building a market for plug-in hybrids

#### Implementing Actions:

- *Purchase (City government) plug-in hybrids when they become available and partner with car share organizations to provide plug-in hybrids to car share pods throughout the city.*

### c. Policy: Encourage the responsible production of low-carbon bio-fuels

#### Implementing Actions:

- *Initiate efforts to convert local restaurant grease into bio-fuel for City-owned and private vehicles.*
- *Partner with local organizations and bio-fuel providers to educate the community on the role responsibly produced bio-fuels can play to reduce local emissions.*

## 9. ***Goal: Enhance and expand outreach, marketing and education regarding land use and transportation***

Personal choice underlies many of the transportation-related changes that will have to occur in order for the community to achieve its GHG-reduction goal. Enhancing and expanding current education and outreach efforts is therefore fundamental to this plan. Such efforts are aimed at providing community members with access to information that enables them to make informed choices. For example, specific information about the economic and environmental impact of riding public transit or a bicycle as opposed to driving a car may influence the transportation choices one makes. Along with the City government, regional agencies and local community-based organizations are already playing a key role in providing information that can inform community members' choices.

The actions outlined below represent a strategic start rather than a comprehensive list of the things our community can do to affect behavior change. New and innovative ideas for creating social change happen all the time. The City and its partners will continue to seek and harness those ideas in order to make alternative transportation the mainstream. See the chapter on Community Outreach & Empowerment for more.

### a. ***Policy: Work with regional and local community partners to provide sustained outreach and education to Berkeley citizens and visitors regarding alternative forms of transportation***

#### **Implementing Actions:**

- *Launch marketing and branding campaign that informs community members of their alternative transportation options.*
- *Include transportation-related education materials in a welcome package for all new homebuyers/renters.*
- *Consider expanding existing TravelChoice-Berkeley program.* Coordinated by the Oakland-based TransForm, TravelChoice is an innovative program aimed at reducing single occupancy vehicle trips and congestion while promoting healthy physical activity. Through door-to-door canvassing and connecting with people by phone, the program provides interested residents with information and incentives to add more walking, biking, public transit and carpooling into their daily routines.

In 2007-08, TravelChoice started in Berkeley, contacting over 7,500 households in south and west Berkeley. In early 2008 an additional 9,000 households were contacted in north Berkeley and along San Pablo Avenue.

- *Sustain and expand the Safe Routes to School Program (SR2S.)* The program promotes walking and cycling to school and improving traffic safety around schools through education, incentives, increased law enforcement, and engineering measures. The program not only addresses GHG emissions, but also has health-benefits for children. SR2S is currently being implemented in Berkeley through a partnership between TALC and the Berkeley Public Health and Public Works Departments.
- *Design and implement an annual 'Berkeley Car-Free Day' campaign.*
- *Actively promote and participate in annual Bike to Work Day.*



- *Partner with hotels, motels, and other visitor destinations to provide visitors with information regarding public transit, bicycle and pedestrian facilities.*
- *Partner with local business associations to market the "Buy Local" campaign. Buying local has the potential to reduce GHG emissions by eliminating car trips to more remote destinations.*

**10. Goal: *Green the vehicle fleet used by the City government and increase alternative transportation options for employees of public institutions***

The Berkeley City government has an active alternative fuel vehicle program, including a variety of electric, natural gas, and bio-diesel vehicles. In 2003 Berkeley became the first City government to utilize 100 percent bio-fuel in its fleet.

Today the City uses 20 percent bio-diesel (B20) blend and is investigating other alternative fuel options. The Berkeley Unified School District (BUSD) also utilizes B20 bio-diesel for its buses.

Berkeley also showed innovative leadership in retiring underused fleet vehicles and replacing them with City CarShare hybrid-electric vehicles.

**a. Policy: *Increase fuel efficiency and use of alternative fuels in City government fleet***

**Implementing Actions:**

- *Retire underused and inefficient City fleet vehicles.*
- *Replace additional City fleet vehicles with City CarShare vehicles.*
- *Partner with City CarShare to integrate plug-in hybrid vehicles into the City's fleet.*
- *Purchase plug-in hybrids for City fleet when available.*
- *Ensure that bio-fuel utilized by the City fleet is responsibly produced and creates a GHG emissions reduction benefit when analyzed from a lifecycle perspective. Investigate using recycled grease from local restaurants as a fuel alternative.*
- *Consider increasing bio-fuel mix used by the City from B20 to B50 or higher.*
- *Increase the fuel and route efficiency of Office of Solid Waste trucks by converting trucks to low-emission engines; utilizing route-efficiency software; and utilizing a higher percentage bio-diesel or other low-carbon fuel.*
- *Institute a City purchasing policy that requires the procurement of low-emissions vehicles whenever new vehicles need to be acquired.*

**b. Policy: *Encourage the use of alternative transportation for City employees***

**Implementing Actions:**

- *Continue to supply City employees with the Easy Pass (formerly Eco-Pass). Work to include BART ridership as part of the Easy Pass benefit.*
- *Continue to supply City employees with pre-tax transit subsidies such as Commuter Check.*
- *Continue to offer deeply discounted carpool and vanpool monthly parking permits at City parking facilities.*

- *Except in cases where certain City staff persons have no alternative to driving to and from work (e.g., emergency personnel who work overnight), phase out free parking assigned to City staff for privately owned vehicles.*