

## 1 2. ENVIRONMENTAL SUSTAINABILITY

### 2 STRATEGIC STATEMENT

#### 3 SUSTAINABILITY AS THE FRAMEWORK FOR FUTURE ACTION

4 The concept of sustainability is central to Berkeley's vision for its Downtown, and is the  
5 overarching framework for the development and implementation of Berkeley's  
6 Downtown Area Plan. Global imperatives such as climate change, increasing scarcities  
7 and degradation of natural resources -- and local demands for more livable, healthy, and  
8 equitable communities -- make sustainability an essential concern.

9 The concept of sustainability reflects Berkeley's values, and is expressed as a priority in  
10 Berkeley's General Plan, in its socially and environmentally progressive history, and in  
11 the public's overwhelming endorsement of Measure G to reduce the city's greenhouse gas  
12 emissions by 80% by 2050.

13 Environmental sustainability, economic vitality, and the social well-being of the  
14 community are inextricably linked. Balanced and integrated consideration of the  
15 environment, the economy, and social health is necessary to foster lasting benefits to  
16 Berkeley's diverse community, present and future.

#### 17 SUSTAINABILITY DEFINED

18 *A sustainable society is one that satisfies its needs without diminishing the*  
19 *prospects of future generations. -- Lester Brown, Founder and President,*  
20 *Worldwatch Institute*

21 *Sustainability is the capability to equitably meet the vital human needs of*  
22 *the present without compromising the ability of future generations to meet*  
23 *their own needs by preserving and protecting the area's ecosystems and*  
24 *natural resources. -- American Planning Association*

25 Definitions of sustainability address the essential need for maintenance of a healthy,  
26 vibrant, and ecologically functional planet in the future. To do this and also provide for  
27 human needs, sustainability needs to acknowledge that **ecological/environmental health,**  
28 **economic health, and social/community health are inextricably linked.**

29 The Downtown Area Plan seeks to translate these broad definitions of sustainability into  
30 specific actions that both target the future, while acknowledging present realities and the  
31 need for balancing competing considerations. This chapter focuses on the concept of

32 environmental sustainability and its integration with the Downtown Area Plan, but also  
33 references related economic, social, transportation, and urban design sections of the Plan.

## 34 **A MORE SUSTAINABLE DOWNTOWN**

35 The Downtown Area Plan plays a vital role in meeting Berkeley's future needs in ways  
36 that minimize our impact on ecological systems and the world as a whole.

37 Specific goals and actions to achieve a more sustainable downtown must include the  
38 following.

39 1) Reducing net energy consumption and greenhouse gas emissions:

- 40 • Making it easier for people to walk, bike, and use transit;
- 41 • Promoting energy efficient building design;
- 42 • Relying on state-of-the-art green building construction;
- 43 • Retrofitting existing buildings with new windows and insulation, and energy  
44 efficient appliances;
- 45 • Generating renewable energy using photovoltaic panels, wind turbines, and other  
46 emerging technologies;
- 47 • Shifting consumption toward locally generated goods and services;
- 48 • Supporting transit-oriented development; and
- 49 • Improving Berkeley's jobs-housing balance.

50 2) Conserving water and restoring ecological systems:

- 51 • Increasing the number of street trees and promoting other forms of vegetation;
- 52 • Relying on natural features and permeable paving to capture and filter runoff,  
53 recharge aquifers, and reduce flooding;
- 54 • Minimizing water use with drought-tolerant landscaping, low-flow appliances,  
55 and water recycling; and
- 56 • Replenishing stormwater quality and groundwater tables by facilitating natural  
57 features, landscaping, and permeable paving materials.

58 3) Minimizing waste:

- 59 • Expanding convenient reuse and recycling opportunities;

- 60 • Emphasizing goods and construction that are resource-efficient; and
  - 61 • Encouraging the retention of historic resources and resource-intensive buildings.
- 62 *4) Supporting economic development and the health of community members:*
- 63 • Offering a highly appealing place to live, work, learn and visit;
  - 64 • Keeping business and building operating costs low;
  - 65 • Making Downtown a model for green business and environmental practices;
  - 66 • Being an advantageous location to conduct business and a special place to visit;
  - 67 and
  - 68 • Creating a highly livable place, featuring exceptional streets, parks, and
  - 69 architecture.

70 An environmentally sustainable Downtown must be “green” not only in appearance, but  
 71 also in the underlying effectiveness, continuity, and regeneration of the natural systems  
 72 with which it is intertwined. Downtown’s buildings, streets, plants, and activities have  
 73 profound impacts locally and beyond, in terms of water and air quality, resources  
 74 conservation, and reduced consumption of non-renewable energy. An environmentally  
 75 sustainable Downtown will include not only the valuable and more visible features that  
 76 we associate with nature (an abundant tree canopy, attractive landscaping, open spaces,  
 77 and habitat restoration), but also innovative technologies for buildings and transportation,  
 78 appropriate building envelopes and site design, transit-oriented land use, and thoughtful  
 79 management of potentially harmful activity, including how we dispose of our waste.

80 **KEY ENVIRONMENTAL COMPONENTS AND THEIR BENEFITS**

81 Sustainable cities depend on the integrity of several key natural elements: water, air,  
 82 vegetation/trees, and earth/soil. When these natural elements are healthy and functioning,  
 83 they bring ecological, economic, and community benefits to urban areas. The Downtown  
 84 Area Plan should incorporate the protection and enhancement of these natural elements  
 85 into its goals, policies, and implementation mechanisms. Effective policies for  
 86 environmental sustainability will require comprehensive and coordinated strategies. In  
 87 particular, City departments will need to collaborate on interrelated policies and actions,  
 88 crossing over traditional boundaries and specialties. Developers and other stakeholders  
 89 also play a pivotal role in the shaping the future for public and private land.

90 **AIR QUALITY, NOISE, ENERGY, AND GREENHOUSE GAS EMISSIONS**

91 Global climate change is arguably the defining environmental issue of the next century.  
92 The City of Berkeley has committed to meeting this challenge, with Berkeley voters  
93 overwhelmingly approving Measure G in 2006, which calls for aggressive local action to  
94 reduce greenhouse gas emissions. Measure G set a target of reducing greenhouse gas  
95 emissions 80% by the year 2050. Goals, policies, and implementation measures  
96 contained in the Downtown Area Plan are expected to make a significant contribution to  
97 attaining this goal.

98 There are two major phases to attaining Berkeley's climate protection target:

- 99 1) identify the sources and quantity of our community's greenhouse gas emissions;  
100 and
- 101 2) develop and implement policies and actions to reduce those emissions.

102 As part of the first phase, an inventory of Berkeley's 2005 greenhouse gas emissions was  
103 conducted by ICLEI-Local Governments for Sustainability ([www.iclei.org](http://www.iclei.org)), an  
104 international organization that provides the standards and methodology by which  
105 municipalities measure community-level emissions.

106 An emissions inventory provides a snapshot of a community's emissions (sources and  
107 quantity) for a given year. ICLEI's study estimates Berkeley's 2005 per capita  
108 greenhouse gas emissions to be approximately 7 tons, significantly lower than the  
109 national average. This lower-than-average figure is not unexpected for a number of  
110 reasons, including:

- 111 • Berkeley's temperate climate enables residents and business owners to use  
112 comparatively less heating and air conditioning than other parts of the country;
- 113 • the mix of energy sources PG&E uses to produce electricity for its service  
114 territory is comparatively cleaner than other regions in the U.S.; and
- 115 • the City has progressive energy regulations such as the Residential and  
116 Commercial Energy Conservation Ordinances.

117 There are three principal sources for the carbon generated locally:

- 118 • transportation is the single largest contributor to Berkeley's greenhouse gas  
119 emissions, accounting for roughly half of emissions;
- 120 • commercial buildings and industrial uses account for about one-quarter of all  
121 emissions; and
- 122 • the residential sector also accounts for about one-quarter of all emissions.

123 Having assessed the sources and levels of the city’s emissions, the Downtown Area Plan  
124 can play a key role in achieving greenhouse gas reduction targets. The form of  
125 development promoted by the Downtown Area Plan intends to reduce transportation-  
126 related greenhouse gases. For buildings, greenhouse gas generation will also be reduced  
127 by implementing this Plan.

128 **Transit-Oriented Development (TOD) and Pedestrian-Oriented Development.**

129 Walk-to destinations (such as shops, services, and amenities) and easy access to transit  
130 are clearly factors that make Downtown a place where residents, workers, and visitors  
131 can navigate easily on foot. Higher densities and high-quality walking environments are  
132 also needed to reduce car use, as is the relative ease with which one can use transit  
133 compared with using a car. For travel into and out of the Downtown, transit service must  
134 be frequent and reliable. Higher densities are necessary to support these conditions.

135 **Energy Efficient Buildings.** The United Nations Environment Program (UNEP)  
136 Sustainable Building and Construction Initiative (SBCI) has estimated that 30-40 % of  
137 global energy is consumed in the operation of buildings. The right mix of appropriate  
138 government regulation, greater use of energy saving technologies and behavioral change  
139 can substantially reduce energy and greenhouse gas impacts resulting from buildings.

140 For heating and cooling, energy benefits can be obtained in a variety of ways, including:  
141 super insulation, efficient HVAC (Heating, Ventilation, Air Conditioning) systems,  
142 passive solar features (for winter months), shading devices (for summer months), and  
143 natural ventilation using operable vents and windows.

144 For lighting, use of low-energy fixtures and daylight play important roles. As a general  
145 rule, windows bring daylight about 40 feet into a space; light shelves (that bounce light)  
146 and skylights can bring more light to interior spaces.

147 Green building has also been shown to improve the health and well-being of occupants.  
148 There is a large body of research linking health and productivity with indoor air quality,  
149 lighting levels, and an ability to control air flow and temperature (such as through  
150 operable windows).

151 Buildings increasingly provide an armature for generating electricity. Photovoltaic and  
152 wind technologies have improved significantly and are becoming commonplace.

153 **Noise.** Downtown is different from other residential neighborhoods in that it is intended  
154 to have a higher intensity of overall activity, including nighttime activity (such as  
155 restaurants and music venues). Health and livability should be enhanced through noise-  
156 related standards for sound insulation and mechanical noise. The location and intensity  
157 of noise should also be monitored, and the potential relationship between building form

158 and materials and noise should be studied, so that noise standards can continue to be  
159 improved. (Noise-related policies appear in the Housing and Community Health &  
160 Services chapter Policies HC-1.4, -1.5, and -1.6.)

161 **Urban Forest.** Downtown Berkeley needs more trees. Trees have significant  
162 environmental, aesthetic, and economic benefits. Air quality authorities across the  
163 country are promoting planting programs for street trees and other trees in urban areas to  
164 reduce high temperatures absorbed by unshaded asphalt. Heat increases the ozone from  
165 automobile exhaust, which contributes to smog and respiratory ailments. Shaded streets  
166 are significantly cooler on summer days. Trees help to reduce smog and greenhouse  
167 gases. Street trees will also play a major role in enhancing Downtown's character and  
168 charm -- and will give Downtown an exceptional "special sense of place."

## 169 WATER QUALITY AND MANAGEMENT

170 **Stormwater.** Pollution from urban runoff (stormwater) is the greatest contributor to  
171 degraded water quality in the Bay Area. Increased urban runoff is a direct consequence  
172 of development and the associated loss of natural water retention and filtration through  
173 the installation of impervious surfaces. Berkeley does not meet the current, State-  
174 mandated water quality standards for urban runoff. Meanwhile, the State standards are  
175 themselves becoming even more stringent, suggesting that the City will be hard-pressed  
176 to comply with future regulations using its existing stormwater treatment approaches.

177 At the same time, engineered stormwater treatment systems, which were installed 50-60  
178 years ago, are now failing throughout the Bay Area (and California) as they reach the end  
179 of their projected "lifespans." Berkeley's stormwater system repair costs were recently  
180 estimated to be in the range of \$100 million or more.

181 Green strategies for stormwater treatment are being implemented throughout the Pacific  
182 Northwest, and in other parts of California, as a more cost-effective and multi-beneficial  
183 solution to the challenges outlined above. Specifically, green approaches include:  
184 reducing impermeable surfaces, adding vegetation and soils that can absorb and filter  
185 stormwater, and restoring natural waterways and/or creating natural drainage swales to  
186 complement the engineered stormwater treatment systems now in existence.

187 **Flooding.** Green strategies can reduce both localized and downstream flooding.  
188 Traditionally, drainage and stormwater management in urban areas has focused on  
189 "conveyance" – moving water easily into a network of pipes and channels, and delivering  
190 it as rapidly as possible to a river or bay. Because water moves swiftly within a  
191 conveyance-based system, little lag time occurs between heavy rains and when the water  
192 from those rains enters streets, pipes, and channels, resulting in flooding in some  
193 locations.

194 Green approaches to stormwater management and treatment create a decentralized  
195 network for stormwater retention that holds water back near its source, and/or in stages as  
196 it flows downhill and across the urban landscape. Ideally, retention features also provide  
197 for stormwater “infiltration,” where stormwater seeps into the soil and ultimately reaches  
198 local aquifers, if underlying soil conditions permit.

199 **Water Conservation/Recycling.** Downtown Berkeley can play an important role in  
200 conserving water resources, for which there will be increasing competition statewide.  
201 For landscaped areas, drought resistant plants and low-water irrigation systems are  
202 important components. Conservation techniques available for buildings include low flow  
203 fixtures and the use of greywater for flushing and irrigation. At a larger scale, water  
204 recycling could serve to irrigate city and University green spaces.

205 **Integrated Solutions to Water Management.** Many of the stormwater, flooding, and  
206 water conservation objectives discussed above can be addressed in a holistic manner by  
207 incorporating integrated approaches to the Downtown Area Plan, which provide multiple  
208 benefits across a range of important goals.

209 For example, currently much of the City’s paved, impervious surfaces serve the  
210 automobile. By reducing dependency on cars and converting pavement to landscaping,  
211 the City can reduce the amounts of impervious surface within its boundaries, and in the  
212 public right-of-way, thus helping to alleviate flooding and allowing for more naturally-  
213 based stormwater treatment opportunities. But narrowing or eliminating roads, and  
214 increasing landscaping and permeable hardscapes may have benefits not only to the  
215 environment, but also to the social life of neighborhoods, the walkability of the  
216 Downtown area, and even localized climate change mitigation.

217 Creating a variety of open spaces can play a vital role in reducing the city’s  
218 environmental footprint and supporting human health and enjoyment. These open spaces  
219 can be designed to accomplish important ecological goals (such as natural flood retention  
220 areas), but will also serve as recreational and social gathering spaces for residents and  
221 visitors – again providing multiple benefits through integrated planning and design.

## 222 ZERO WASTE

223 Berkeley’s City Council has adopted a goal of reducing the amount of waste going to  
224 landfills to zero by 2020. Achieving our community’s zero waste goal will have a  
225 significant impact on the greenhouse gas emissions for which Berkeley is responsible.  
226 First, reducing waste sent to the landfill serves to reduce the methane released by waste  
227 breaking down in an anaerobic environment. Second, products made from recycled  
228 materials require significantly less energy to produce than products made from raw

229 materials. Estimates are that for every one ton of mixed waste that is recycled, over two  
230 tons of greenhouse gas emissions are eliminated from the atmosphere.<sup>1</sup>

## 231 **PERCEIVED OBSTACLES TO SUSTAINABLE PRACTICES**

232 **Up-Front Capital Costs Versus Long-Term Benefits.** Increased cost of green design  
233 is typically offset by saving elsewhere, for example in reduced cost of heating, lighting,  
234 water, and waste management. Green buildings typically require greater up-front “capital  
235 costs” while reducing ongoing “operating costs.” Since the first years of a project present  
236 the highest financing costs and project risks, builders often emphasize near-term capital  
237 costs instead of long-term savings associated with reduced use of energy, water, and  
238 other resources. The City can play a vital role by encouraging lenders to recognize that  
239 reductions in future operating costs can help pay for loans to pay for “green” projects.  
240 The City can also play a direct role by creating new public financing mechanisms, such  
241 as the proposed Public Improvement District, which – if adopted -- will make it possible  
242 for any Berkeley property owner to borrow money for green projects, and pay it back at a  
243 low rate of interest and with the debt transferring to future owners of the property, so that  
244 the loan need not be paid off if the property is sold.

## 245 **GOALS & POLICIES**

### 246 **GOAL ES-1: INTEGRATE ENVIRONMENTALLY SUSTAINABLE** 247 **DEVELOPMENT AND PRACTICES IN THE DOWNTOWN AREA AND FOR** 248 **ALL ASPECTS OF THE DOWNTOWN AREA PLAN.**

249 **Policy ES-1.1.** All aspects of development, including density, sites, buildings,  
250 stormwater features, landscaping, and waste management systems should be designed to  
251 reduce the generation of greenhouse gases, minimize the use of non-renewable resources,  
252 minimize impacts on “downstream” ecosystems, support comfortable human  
253 environments, and communicate the community’s commitment to sustainability. (See  
254 Goals that follow.)

255 **Policy ES-1.2.** Proposed development and infrastructure should maximize ecological  
256 quality and functions. Natural features, landscaping, and permeable paving materials  
257 will be incorporated into infrastructure systems to help protect and restore naturally  
258 functioning ecosystems.

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<sup>1</sup> DAPAC requests that Planning Commission and staff work with waste experts to develop strategic Statement and policies under Goal ES-6.

259 **Policy ES-1.3.** Create places for people that contribute tangibly to the community  
260 environment, use sustainable materials, demonstrate minimal resource consumption, and  
261 employ approaches to sustainable landscape design, thereby encouraging people to  
262 appreciate and understand sustainable practices.

263 **Policy ES-1.4.** Encourage City partnerships with private concerns, the University of  
264 California, and organizations to encourage research and development of tools and  
265 techniques that can improve the environmental performance of Downtown Berkeley, and  
266 may have broad application for other urban centers.

267 **GOAL ES-2: ENCOURAGE HIGHER-DENSITY, HIGHLY LIVABLE**  
268 **DEVELOPMENT TO TAKE ADVANTAGE OF DOWNTOWN'S PROXIMITY**  
269 **TO REGIONAL TRANSIT AND TO SUPPORT THE CREATION AND**  
270 **AVAILABILITY OF DIVERSE WALK-TO DESTINATIONS -- SUCH AS**  
271 **RETAIL, SERVICES, CULTURE, AND RECREATION.**

272 **Policy ES-2.1.** Allow higher-density development, especially in the Core Area and along  
273 the Shattuck and University corridors. *(See policies within Land Use chapter.)*

274 **Policy ES-2.2.** Make major enhancements and additions to parks, plazas, streets, and  
275 other open space. *(See policies in Streetscapes & Open Space chapter.)*

276 **Policy ES-2.3.** Protect historic resources and the character of surrounding residential  
277 neighborhoods. *(See related policies in Historic Preservation & Urban Design chapter.)*

278 **Policy ES-2.4.** Encourage exceptional, high-quality new architecture, and minimize  
279 noise, glare and other nuisances generated by urban development. *(See also related*  
280 *policies in Historic Preservation & Urban Design chapter.)*

281 **Policy ES-2.5.** Public improvements and programs will give priority to the comfort,  
282 convenience and safety of pedestrians in the Downtown. *(See also related policies in*  
283 *Access chapter.)*

284 **Policy ES-2.6.** Enhance and expand transit service, and other alternatives to the  
285 traditional use and ownership of automobiles, in the Downtown. *(See also related*  
286 *policies in Access chapter.)*

287 **GOAL ES-3: PROMOTE “GREEN” BUILDINGS.**

288 **Policy ES-3.1.** Establish development requirements and/or incentives for highly energy  
289 efficient new buildings through design and construction techniques including: super  
290 insulated walls, windows, and doors; daylighting interiors; passive solar heating; natural  
291 ventilation; and efficient appliances and equipment. Also establish standards and

292 incentives for energy savings through the renovation or transfer of ownership of existing  
293 buildings.

294 **Policy ES-3.2.** The City should establish requirements for building energy performance  
295 which significantly exceed the State of California's Title 24 requirements, while also  
296 encouraging natural ventilation. Buildings with multiple tenants should be "sub-metered"  
297 so that the cost of energy is communicated to the tenant who is consuming it. [Note:  
298 some benefits from natural ventilation are not recognized by Title 24, and therefore need  
299 to be acknowledged in this policy.]

300 **Potential Implementation Measure:** Require new projects to exceed  
301 Title 24 by 20%, and allow: a 5% credit for natural ventilation, and a  
302 credit for on-site renewable generation.

303 **Policy ES-3.3.** For Downtown, amend the City's existing "Green Building Requirements"  
304 to require USGBC's LEED prerequisites for commercial projects, Build It Green's  
305 GreenPoints prerequisites for residential projects, or equivalent requirements if the City  
306 develops some other standard. New buildings that exceed 65 feet in height should have a  
307 performance rating equivalent to LEED Gold or the Build It Green equivalent. (See  
308 Policy LU-1.4.)

309 **Policy ES-3.4.** Require that development projects undergo whole-building energy  
310 performance modeling by a certified examiner, such as what is made available by PG& E  
311 at no cost. Also, require project applicants to submit an analysis comparing the energy  
312 lost from demolition of existing buildings (including a building's embedded energy), with  
313 ongoing energy savings from new construction; the City should develop guidelines for a  
314 fair and informative analysis.

315 **Policy ES-3.5.** After construction, require buildings to be commissioned to verify and  
316 ensure that building elements and systems are designed, installed, calibrated and  
317 performing as designed.

318 **Policy ES-3.6.** Through development and financing incentives, encourage "zero-carbon"  
319 buildings, through the generation of renewable energy using photovoltaic panels, solar  
320 hot water heating, and/or wind turbines.

321 **Policy ES-3.7.** Expand electric car and hybrid plug-in locations and connect new  
322 locations to local renewable energy sources.

323 **Policy ES-3.8.** Require water conservation through the installation and/or replacement of  
324 water fixtures. Encourage the use of cisterns, green roofs, and other devices for  
325 conserving water, retaining rainwater, improving stormwater quality, and reducing

326 flooding. Encourage water recycling through the use of graywater for flushing toilets,  
327 irrigation, and other sanitary purposes.

328 **Policy ES-3.9.** Prohibit use of materials that produce unacceptable levels of toxins in  
329 their production or after installation, and prohibit wood or other plant species that are  
330 threatened or endangered.

331 **Policy ES-3.10.** Encourage materials that reuse or recycle materials, requiring such  
332 materials when feasible.

333 **Policy ES-3.11.** Establish minimum indoor air quality (IAQ) performance to enhance the  
334 comfort and well-being of occupants, and develop noise standards consistent with  
335 Housing and Community Health & Services Policies HC-1.4 through HC-1.6.

336 **Policy ES-3.12.** Maintain high standards for the noise attenuation of mechanical  
337 equipment, and for equipment and activities in building loading and service areas.

338 **Policy ES-3.13.** Encourage use of durable materials that are properly detailed (and  
339 therefore require less frequent maintenance or replacement).

340 **Policy ES-3.14.** Establish requirements and guidelines for “green” site design standards  
341 that optimize energy performance and provide open space, permeable surfaces, and other  
342 features that benefit the environment, while also contributing to Downtown’s traditional  
343 sense of place.

344 **Policy ES-3.15.** Design and locate new buildings in a manner that will minimize  
345 unacceptable shading on public open spaces. The City will develop design guidelines to  
346 implement this policy.

347 **Policy ES-3.16.** Provide public education and technical assistance to encourage private  
348 builders to factor mid- and long-term “life-cycle costs” in the design of buildings,  
349 recognizing that higher up-front costs accompany most green buildings, but that reduced  
350 operating expenses and other factors limit future costs.

351 **Policy ES-3.17.** Encourage the adaptive reuse and intensification of historic resources.  
352 (as provided in the chapter on Historic Preservation and Urban Design).

353 **Policy ES-3.18.** Establish requirements/standards for substantial water conservation and  
354 recycling in new buildings, building additions, and building renovations.

355 **Policy ES-3.19.** Communicate techniques related to the aforementioned green building  
356 policies, and established preferred development practices through amendments to the  
357 Downtown Design Guidelines, and as development standards as appropriate.

358 **Policy ES-3.20.** Develop a program and schedule for retrofitting civic buildings in  
359 Downtown in pursuit of these policies.

360 **Policy ES-3.21.** Give priority to green buildings and retrofits through permitting,  
361 streamlining and other procedures.

362 **Policy ES-3.22.** Consider City support for zero-emissions projects that demonstrate state  
363 of the art methods for energy efficiency and the generation of electricity.

364 **Policy ES-3.23.** Encourage existing building owners and managers to adopt green  
365 maintenance and operations procedures. These include the use of integrated pest  
366 management, environmental preferable purchasing and waste reduction.

367 **GOAL ES-4: IMPROVE STORMWATER QUALITY AND FLOOD**  
368 **MITIGATION IN DOWNTOWN AND ITS ENVIRONS. (SEE ALSO**  
369 **"STREETSCAPES & OPEN SPACE GOAL OS-2 AND RELATED POLICIES.)**

370 **Policy ES-4.1.** As intensification of the Downtown occurs, the City will seek to attain  
371 "no new net runoff." The City will develop a stormwater strategy for Downtown which  
372 provides for the retention of stormwater and, to the extent feasible, the recharge of local  
373 aquifers. The stormwater strategy will be integrated with the development of a new  
374 public improvements plan and revisions to the Downtown Design Guidelines. It should  
375 also look beyond the boundaries of Downtown to address systemwide issues and  
376 opportunities, and should engage the University of California as a partner in this process.

377 **Policy ES-4.2.** Establish standards and guidelines to minimize installation of new  
378 impermeable surfaces, while maximizing permeable areas (including both greenscape and  
379 hardscape areas).

380 **Policy ES-4.3.** Design public improvements, including streets, parks and plazas, for  
381 diverting urban runoff (containing waterborne pollutants) to vegetated depressions (or  
382 swales) and other infiltration areas (at-grade and sub-grade). Create a comprehensive  
383 Public Improvements Plan, so that these features can be designed as part of an integrated  
384 system. (See "Streetscapes & Open Space" Policy OS-1.2.) Specific opportunities  
385 include: Center Street; streets where travel lanes might be eliminated; median strips that  
386 might be retrofitted and/or widened; traffic circles; parks; and plazas. Encourage the  
387 University to explore opportunities for naturalized stormwater features along the western  
388 edge of the Campus, such as at the southwest corner of "the Crescent." (See  
389 "Streetscapes & Open Space" Goal OS-2 and related Policies.)

390 **Policy ES-4.4.** Establish standards and guidelines for retention and infiltration of  
391 stormwater associated with new private development. Give consideration to use of

392 public open space features to help meet this objective. Where on-site features are  
393 advisable, retention and infiltration areas may include but are not limited to: at-grade  
394 swales, green roofs or rain gardens, and below-grade dry wells or other retention basins.  
395 Stormwater can be directed to retention/infiltration areas using landscaping, permeable  
396 paving, downspouts, and gutters. Consider use of green roofs and roof cisterns for  
397 stormwater retention.

398 **Policy ES-4.5.** Encourage cisterns to use rainwater for irrigation, and as an emergency  
399 source of water if water service is interrupted.

400 **GOAL ES-5: PROMOTE ECOLOGICALLY BENEFICIAL LANDSCAPING**  
401 **AND RESTORATION OF NATURAL FEATURES THROUGHOUT THE**  
402 **DOWNTOWN TO IMPROVE THE ENVIRONMENT AND TO EXPRESS THE**  
403 **COMMUNITY'S COMMITMENT TO ENVIRONMENTAL SUSTAINABILITY.**

404 **Policy ES-5.1.** Develop and implement landscaping guidelines used by the City's  
405 municipal projects, such as the Bay Friendly Guidelines, that specify designing for local  
406 conditions and plant communities, waste reduction, nurturing the soil, conserving water  
407 and energy, protecting water and air quality, and creating wildlife habitat.

408 **Policy ES-5.2.** Promote extensive tree planting along streets, in midblock courtyards, in  
409 parks, and in plazas. All tree installations should be accompanied by soil and drainage  
410 systems to encourage each tree's healthy maturation.

411 **Policy ES-5.3 (also part of Policy OS-1.2).** Develop standards and guidelines for  
412 streets, parks, and plazas, which emphasize trees, landscaping, and pedestrian-scaled  
413 lighting. Develop a Street Tree Master Plan (in association with a new Public  
414 Improvements Plan) that selects appropriate tree and plant species for streets and open  
415 spaces. Relate design features to the special character and predominant uses along each  
416 street and around each open space. Consider native tree and plant species near existing  
417 and future naturalized features. Develop standards for street lighting for energy efficient  
418 and to minimize intrusion (glare) in the upper stories of adjacent buildings. (See also  
419 Streetscapes & Open Space Policies OS-1.2, OS-2.1 and OS-2.4.)

420 **Policy ES-5.4.** Establish a Center Street Plaza (for the right-of-way of Center Street east  
421 of Shattuck) which is a model for sustainable design and creates a public gathering place.  
422 Use design and a water feature to suggest the extension of Strawberry Creek through the  
423 Plaza. Study whether it is practical to redirect water from Strawberry Creek for the  
424 creation of this water feature, and study the relative merits of redirecting Strawberry  
425 Creek versus using recirculated water. Provide for adequate emergency vehicle access  
426 and for deliveries to plaza-facing businesses. Consider design options that might provide  
427 for very low traffic volumes in the future.

428 **Policy ES-5.5.** Encourage the University to maintain and enhance natural areas along  
429 Strawberry Creek, and work with the University to construct a small overlook and  
430 pavilion where Strawberry Creek enters a culvert near Oxford Street.

431 **Policy ES-5.6.** Consider daylighting Strawberry Creek in or next to MLK Civic Center  
432 Park. Enhance landscaping along the entire length of Center Street to create a green  
433 connection that links Civic Center Park to the UC Campus. (See Streetscapes & Open  
434 Space Policy OS-1.1.1 and OS-1.2.3.)

435 **Policy ES-5.7.** Establish standards and guidelines for private development, which  
436 provide for additional greenery and environmental enhancements on-site, and require  
437 usable and/or landscaped open space (See Policy OS-2.2.). Private open space might  
438 include, but is not limited to, midblock walkways, midblock courtyards, street-facing  
439 courtyards, roof gardens, and landscaped setbacks. Standards and guidelines shall  
440 encourage environmentally beneficial features. (See also related provisions contained in  
441 Streetscapes & Open Space and Land Use chapters.)

442 **Policy ES-5.8 (same as Policy OS-2.4).** Maintain mature trees wherever possible.  
443 Permit the elimination of mature trees only in instances of transmissible disease, public  
444 safety, or overriding public benefits, but only after opportunities for public comment, and  
445 only after findings have been made according to criteria to be established. Establish  
446 standards and guidelines for the retention of trees and the replacement of trees for  
447 instances when tree removal is unavoidable.

448 **Policy ES-5.9 (same as Policy OS-2.5).** Establish standards for substantial water  
449 conservation and recycling in new landscaping and retrofits. Require use of drought  
450 tolerant plants and advanced irrigation systems to substantially reduce water use.  
451 Consider the feasibility of graywater recycling, in partnership with the University, and  
452 give consideration to a water recycling plant, in partnership with the University of  
453 California, that could make water available for the irrigation of public and University  
454 open spaces.

455 **Policy ES-5.10.** Promote programs and educational mechanisms to enhance and highlight  
456 benefits of “nature in the city” (e.g. improved songbird habitat, fish habitat restoration on  
457 the UC Campus, the effects of tree and other vegetation on microclimate, etc.).

458 **GOAL ES-6: MINIMIZE WASTE GENERATED BY HOUSEHOLDS,**  
459 **BUSINESSES, INSTITUTIONS AND DEMOLITION, BY REDUCING THE USE**  
460 **OF MATERIALS, AND BY ENCOURAGING THE REUSE AND RECYCLING**  
461 **OF MATERIALS. STRIVE TO MAKE DOWNTOWN A "ZERO WASTE ZONE"**  
462 **BY REDUCING WASTE DESTINED TO LANDFILLS.**

463 **Policy ES-6.1.** Develop programs that provide on-site recycling opportunities for  
464 apartment/condominium dwellers, and explore the creation of a Downtown drop-off  
465 facility for recyclables that are not included with curbside recycling (such as batteries,  
466 electronics, and compact fluorescent bulbs), and for the safe disposal of hazardous  
467 household wastes.

468 **Policy ES-6.2.** Minimize construction and demolition waste through demolition  
469 avoidance and/or recycling of demolition material.

470 **Policy ES-6.3.** Develop and adopt guidelines for accessible storage and collection areas  
471 for the separation and collection of recyclable materials by business type.

472 **GOAL ES-7: PROMOTE THE PUBLIC’S UNDERSTANDING AND**  
473 **APPRECIATION OF SUSTAINABLE DEVELOPMENT PRACTICES BY**  
474 **DEMONSTRATING THEM, AND IN WAYS THAT ARE ATTRACTIVE AND**  
475 **“GREEN.”**

476 **Policy ES-7.1.** Promote Downtown as a place that will attract visitors who want to see  
477 how “green” a city can be.

478 **Policy ES-7.2.** Encourage programs for increasing public awareness of sustainability  
479 features in the Downtown, such as through literature, tours, etc.

480 **Policy ES-7.3.** Develop an interpretive signage program (that is integrated with a new  
481 public improvements plan), which heightens awareness of the Strawberry Creek and  
482 adjoining drainage patterns, natural areas, and sustainability features in Downtown.  
483 Increase awareness of stormwater infrastructure by placing plaques/signs near at-grade  
484 features and interpretive signage, such as decorative manhole covers (similar to those cast  
485 for the Arts District).

486 **GOAL ES-8: ESTABLISH DOWNTOWN AS A RECOGNIZED LOCATION**  
487 **FOR BUSINESSES AND INSTITUTIONS THAT ARE COMMITTED TO**  
488 **ENVIRONMENTAL SUSTAINABILITY.**

489 **Policy ES-8.1.** Encourage “green businesses” to locate Downtown. Work with  
490 developers, real estate brokers, local companies, the University of California the  
491 Convention and Visitors Bureau, and the Downtown Business Association to promote  
492 and market Downtown as a model of sustainable design, as set forth in other Chapters of  
493 this Plan. A marketing plan should focus on attracting green businesses/initiatives,  
494 including but not limited to: technological innovation, technological  
495 conferences/education, incubating start-ups/eco-entrepreneurs, environmental research,  
496 etc.. *(Same policy appears in Economic Development chapter.)*

497 **Policy ES-8.2.** Maintain and expand programs that encourage environmental business  
498 practices to reduce energy use, reduce water use, increase recycling and composting, and  
499 increase awareness of environmental features and activities Downtown.

500 **Policy ES-8.3.** Promote strategies that connect Downtown with local sources of food,  
501 products and services, such as through farmers markets, "community supported  
502 agriculture," and buy-local initiatives. Continue to promote and highlight restaurants that  
503 feature organic and seasonal foods.

504 **GOAL ES-9: CONTINUE TO EVALUATE AND IMPROVE SUSTAINABLE**  
505 **PRACTICES, USING ENVIRONMENTAL, SOCIAL AND ECONOMIC**  
506 **MEASUREMENTS. PROVIDE THE COMMUNITY WITH INFORMATION,**  
507 **AND GIVE OPPORTUNITIES TO PARTICIPATE IN DECISION-MAKING.**

508 **Policy ES-9.1.** In a public report, regularly assess progress being made on  
509 aforementioned sustainability goals and policies, and recommend revisions that might  
510 improve performance. Consider use of rigorous, progressive standards and metrics, such  
511 as current use of LEED.

512 **Policy ES-9.2.** Continue to convene public forums to discuss ongoing issues of concern  
513 in the Downtown.

514 **Policy ES-9.3.** Stress the use of scientifically based environmental research and  
515 management principles to inform decisions regarding economic, social, and physical  
516 planning.