

883 **2. ENVIRONMENTAL SUSTAINABILITY**

884 **STRATEGIC STATEMENT**

885 **SUSTAINABILITY AS THE FRAMEWORK FOR FUTURE ACTION**

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

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

894 Environmental sustainability, economic vitality, and the social well-being of the community are
895 inextricably linked. Balanced and integrated consideration of the environment, the economy, and
896 social health is needed to foster lasting benefits to Berkeley's diverse community, present and future.

897 **SUSTAINABILITY DEFINED**

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

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

903 Definitions of sustainability address the essential need for maintenance of a healthy, vibrant, and
904 ecologically functional planet in the future. To do this and also provide for human needs,
905 sustainability must address the ecological health, environmental health, economic health, and a
906 community's social health comprehensively.

907 The Downtown Area Plan seeks to translate these broad definitions of sustainability into specific
908 actions that target the future while acknowledging present realities and competing considerations.
909 This chapter focuses on the concept of environmental sustainability and its integration within the
910 Downtown Area Plan, but also references related economic, social, transportation, and historic
911 preservation and urban design sections of the Plan.

912 **A MORE SUSTAINABLE DOWNTOWN**

913 The Downtown Area Plan plays a vital role in meeting Berkeley's future needs in ways that minimize
914 our impact on ecological systems and the world as a whole. Actions to achieve a more sustainable
915 downtown must include the following.

916 1) Reduce net energy consumption and greenhouse gas emissions:

- 917 – Make it easier for people to walk, bike, and use transit.
- 918 – Promote energy efficient building design.
- 919 – Use state-of-the-art green building construction.
- 920 – Retrofit existing buildings with new windows and insulation, and energy efficient appliances.
- 921 – Generate renewable energy using photovoltaic panels, wind turbines, and other emerging
- 922 technologies.
- 923 – Shift consumption toward locally generated goods and services.
- 924 – Support transit-oriented development.
- 925 – Improve Berkeley's jobs-housing balance.

926 2) Conserve water and restoring ecological systems:

- 927 – Increase the number of street trees and promoting other landscape features;
- 928 – Rely on natural features and permeable paving to capture and filter runoff, recharge aquifers,
- 929 and reduce flooding; and
- 930 – Minimize water use with drought-tolerant landscaping, low-flow appliances, and water
- 931 recycling.

932 3) Minimize waste:

- 933 – Expand convenient reuse and recycling opportunities.
- 934 – Emphasize goods and construction that are resource-efficient.
- 935 – Encourage the retention of historic resources and the adaptive reuse of buildings.

936 4) Support economic development and the health of community members:

- 937 – Offer a highly appealing place to live, work, learn and visit.
- 938 – Keep business and building operating costs low.
- 939 – Make Downtown a model for green business and environmental practices.
- 940 – Promote Downtown as a unique and advantageous place to visit and conduct business.
- 941 – Create a highly livable place, featuring exceptional streets, parks, and architecture.

942 An environmentally sustainable Downtown must be “green” not only in appearance, but also in the
 943 underlying effectiveness, continuity, and regeneration of the natural systems with which it is
 944 intertwined. Downtown’s buildings, streets, plants, and activities have profound impacts locally and
 945 beyond, in terms of water and air quality, resources conservation, and reduced consumption of non-
 946 renewable energy. An environmentally sustainable Downtown will include not only the valuable and
 947 more visible features that we associate with nature (an abundant tree canopy, attractive landscaping
 948 and open spaces but also innovative technologies for buildings and transportation, appropriate
 949 building envelopes and site design, transit-oriented land uses and intensities, and the minimization of
 950 harmful human activities, such as how we dispose our waste.

951 **KEY ENVIRONMENTAL COMPONENTS AND THEIR BENEFITS**

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

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

961 Global climate change is arguably the defining environmental issue of this century. The City of
962 Berkeley has committed to meeting this challenge, with Berkeley voters overwhelmingly approving
963 Measure G in 2006, which calls for aggressive local action to reduce greenhouse gas emissions.
964 Measure G set a target of reducing greenhouse gas emissions 80% by the year 2050. Goals,
965 policies, and implementing actions contained in the Downtown Area Plan are expected to make a
966 significant contribution to attaining this goal.

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

- 968 a) identify the sources and quantity of our community's greenhouse gas emissions; and
969 b) develop and implement policies and actions to reduce those emissions.

970 As the first phase, an inventory of Berkeley's 2005 greenhouse gas emissions was conducted by
971 ICLEI-Local Governments for Sustainability (www.iclei.org), an international organization that
972 provides standards and methodologies by which municipalities measure community-level emissions.

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

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

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

- 984 – transportation is the single largest contributor to Berkeley's greenhouse gas emissions,
985 accounting for roughly half of emissions;
986 – commercial buildings and industrial uses account for about one-quarter of all emissions; and

987 – the residential sector accounts for about one-quarter of all emissions.

988 Having assessed the sources and levels of the city's emissions, the Downtown Area Plan can play a
989 key role in achieving greenhouse gas reduction targets. The location and form of development
990 promoted by the Downtown Area Plan will reduce transportation-related greenhouse gases. For
991 buildings, greenhouse gas generation will also be reduced by implementing this Plan.

992 **Transit-Oriented Development (TOD) and Pedestrian-Oriented Development.** Walk-to
993 destinations (such as shops, services, and amenities) and easy access to transit are factors that
994 make Downtown a place where residents, workers, and visitors can navigate easily on foot. Higher
995 densities and high-quality walking environments are also needed to reduce car use, as is the relative
996 ease with which one can use transit compared with using a car. For travel into and out of Downtown,
997 transit service must be frequent and reliable. Higher densities are necessary to support and capitalize
998 on these conditions.

999 **Energy and Resource Efficient Buildings.** The United Nations Environment Program (UNEP)
1000 Sustainable Building and Construction Initiative (SBCI) has estimated that 30-40 % of global energy is
1001 consumed in the operation of buildings. The right mix of appropriate government regulation, greater
1002 use of energy saving technologies and behavioral change can substantially reduce energy and
1003 greenhouse gas impacts resulting from buildings.

1004 For heating and cooling, energy benefits can be obtained in a variety of ways, including: super
1005 insulation, efficient HVAC (Heating, Ventilation, Air Conditioning) systems, passive solar features (for
1006 winter months), shading devices (for summer months), and natural ventilation using operable vents
1007 and windows.

1008 For lighting, use of low-energy fixtures and daylight play important roles. As a general rule, windows
1009 bring daylight about 40 feet into a space; light shelves (that bounce light) and skylights can bring
1010 more light to interior spaces.

1011 Green building has also been shown to improve the health and well-being of occupants. There is a
1012 large body of research linking health and productivity with indoor air quality, lighting levels, and an
1013 ability to control air flow and temperature (such as through operable windows).

1014 Buildings increasingly provide an armature for generating electricity. Photovoltaic and wind
1015 technologies have improved significantly and are becoming commonplace.

1016 **Urban Forest.** Downtown Berkeley needs more trees. Trees have significant environmental,
1017 aesthetic, and economic benefits. Air quality authorities across the country are promoting planting
1018 programs for street trees and other trees in urban areas to reduce high temperatures absorbed by
1019 unshaded asphalt. Heat increases the ozone from automobile exhaust, which contributes to smog
1020 and respiratory ailments. Shaded streets are significantly cooler on summer days. Trees help to
1021 reduce smog and greenhouse gases. Street trees also play a major role in enhancing Downtown's
1022 character and charm -- and will help give Downtown an exceptional "sense of place."

1023 **WATER QUALITY AND MANAGEMENT**

1024 **Urban Runoff.** Urban runoff, which is generally run-off from streets when it rains, is the greatest
1025 contributor to degraded water quality in the Bay Area. Increased urban runoff is a direct
1026 consequence of development and the associated loss of natural water retention and filtration through
1027 the installation of impervious surfaces. Berkeley does not meet the current, State-mandated water
1028 quality standards for urban runoff. Meanwhile, State standards are themselves becoming even more
1029 stringent, suggesting that the City will need to implement new stormwater treatment approaches.

1030 Engineered stormwater treatment systems installed 50-60 years ago, are now failing throughout the
1031 Bay Area (and California) as they reach the end of their projected “lifespans.” Berkeley’s stormwater
1032 system repair costs were estimated to be in the range of \$100 million or more (2008).

1033 Green strategies for stormwater treatment are being implemented throughout the Pacific Northwest,
1034 and in other parts of California, as a more cost-effective and multi-beneficial solution to the
1035 challenges outlined above. Specifically, green approaches include: reducing impermeable surfaces,
1036 adding vegetation and soils that can absorb and filter stormwater, and restoring natural waterways
1037 and/or creating natural drainage swales to complement the engineered stormwater treatment systems
1038 now in existence.

1039 **Flooding.** Green strategies can reduce both localized and downstream flooding. Traditionally,
1040 drainage and stormwater management in urban areas has focused on “conveyance” – moving water
1041 easily into a network of pipes and channels and delivering it as rapidly as possible to a river or bay.
1042 Because water moves swiftly within a conveyance-based system, little lag time occurs between heavy
1043 rains and when the water from those rains enters pipes and channels, sometimes resulting in
1044 downstream flooding.

1045 Green approaches to stormwater management and treatment create a decentralized network for
1046 stormwater retention that holds water back near its source, and/or in stages as it flows downhill and
1047 across the urban landscape. Ideally, retention features also provide for stormwater “infiltration,”
1048 where stormwater seeps into the soil and ultimately reaches local aquifers, if underlying soil
1049 conditions permit.

1050 **Water Conservation and Recycling.** Downtown Berkeley can play an important role in conserving
1051 water resources, for which there will be increasing competition statewide. For landscaped areas,
1052 drought resistant plants and low-water irrigation systems are essential components. Conservation
1053 techniques available for buildings include low flow fixtures and the use of greywater for flushing and
1054 irrigation. At a larger scale, water recycling could serve to irrigate city and University green spaces.

1055 **Integrated Solutions to Water Management.** Many of the stormwater, flooding, and water
1056 conservation objectives discussed above can be addressed in a holistic manner by incorporating
1057 integrated approaches to the Downtown Area Plan, which provide multiple benefits across a range of
1058 important goals.

1059 For example, currently much of the City’s paved, impervious surfaces serve the automobile. By
1060 reducing dependency on cars and converting pavement to landscaping, the City can reduce the
1061 amounts of impervious surface in the public right-of-way, thus helping to alleviate flooding and

1062 allowing for more naturally-based stormwater treatment opportunities. Narrowing or eliminating
1063 roads, and increasing landscaping and permeable hardscapes may have benefits not only to the
1064 environment, but also to the social life of neighborhoods, the walkability of Downtown, and even
1065 localized climate change mitigation.

1066 Creating a variety of open spaces can play a vital role in reducing the city's environmental footprint
1067 and supporting human health and enjoyment. These open spaces can be designed to accomplish
1068 important ecological goals (such as natural flood retention areas), but will also serve as recreational
1069 and social gathering spaces for residents and visitors – again providing multiple benefits through
1070 integrated planning and design.

1071 **ZERO WASTE**

1072 Berkeley's City Council has adopted a goal of reducing the amount of waste going to landfills to zero
1073 by 2020. Achieving our community's zero waste goal will have a significant impact on the
1074 greenhouse gas emissions for which Berkeley is responsible. First, reducing waste sent to the landfill
1075 serves to reduce the methane released by waste breaking down in an anaerobic environment.
1076 Second, products made from recycled materials require significantly less energy to produce than
1077 products made from raw materials. Estimates are that for every one ton of mixed waste that is
1078 recycled, over two tons of greenhouse gas emissions are eliminated from the atmosphere.

1079 **PERCEIVED OBSTACLES TO SUSTAINABLE PRACTICES**

1080 **Up-Front Capital Costs Versus Long-Term Benefits.** Increased cost of green design is typically
1081 offset by saving elsewhere, for example in reduced cost of heating, lighting, water, and waste
1082 management. Green buildings typically require greater up-front capital costs while reducing ongoing
1083 operating costs. Since the first years of a project present the highest financing costs and project
1084 risks, builders often emphasize near-term capital costs instead of long-term savings associated with
1085 reduced use of energy, water, and other resources. The City can play a vital role by encouraging
1086 lenders to recognize that reductions in future operating costs can help pay for loans to pay for "green"
1087 projects. The City can also play a direct role by creating new public financing mechanisms. For
1088 example, Berkeley is currently (2009) piloting a program whereby property owners can borrow money
1089 for a solar energy system, with the debt paid as part of the property taxes on the property, and
1090 transferred to future owners of the property, so that the loan need not be paid off if the property is
1091 sold. This program may be expanded to include other energy-saving investments.

1092 **GOALS, POLICIES & ACTIONS**

1093 **GOAL ES-1: INTEGRATE ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT AND** 1094 **PRACTICES IN DOWNTOWN, AND IN EVERY ASPECT OF THE DOWNTOWN AREA PLAN.**

1095 **Policy ES-1.1: Sustainability as Comprehensive.** Consider and develop programs for
1096 environmental sustainability in a comprehensive way, including to reduce the generation of
1097 greenhouse gases, minimize the use of non-renewable resources, minimize impacts on effected
1098 ecosystems, improve public health, promote social equity, and communicate the community's
1099 commitment to sustainability.

1100 a) The City should develop a comprehensive outline to define actions that enhance Downtown's
1101 environmental performance, by summarizing pertinent actions described in this chapter and those
1102 being undertaken citywide to implement Berkeley's Climate Action Plan. This checklist for
1103 environmental action should set priorities for implementation, connect actions to needed funding
1104 and resources, and consider ways to measure and monitor performance.

1105 **Policy ES-1.2: Model Best Practices.** Improve the environmental performance of Downtown
1106 Berkeley, and model best practices applicable to urban centers. (For best practices, refer to the
1107 Policies in this chapter.)

1108 **GOAL ES-2: MODEL BEST PRACTICES FOR SUSTAINABILITY AND PROMOTE DOWNTOWN**
1109 **TO BUSINESSES, INSTITUTIONS, AND RESIDENTS WHO ARE COMMITTED TO**
1110 **ENVIRONMENTAL SUSTAINABILITY.**

1111 **Policy ES-2.1: Promote Downtown as Green.** Promote Downtown as a place that will attract
1112 visitors who want to see how "green" a city can be.

1113 a) Develop literature and internet pages to promote public awareness of sustainability features in
1114 Downtown.

1115 b) Develop an interpretive signage program to heighten awareness of Strawberry Creek, drainage
1116 patterns, natural areas, and sustainability features in Downtown.

1117 c) Create educational programs that highlight the following best practices for sustainability: green
1118 buildings, transit-oriented-development, adaptive re-use and pedestrian and bicycle facilities and
1119 amenities. Also consider establishing walking tours to highlight sustainability features in
1120 Downtown and the idea of "nature in the city" (such as through offering songbird or butterfly
1121 habitat, examining the effects of trees and vegetation on microclimate, or considering fish habitat
1122 in Strawberry Creek which lies just outside of the Downtown Area).

1123 d) Work to attract East Bay Green Corridor Partnership uses Downtown, to demonstrate the City's
1124 and the University's leadership in promoting sustainability (see LU-5.3

1125 **Policy ES-2.2: Green Businesses.** Encourage new "green businesses" to locate Downtown, and
1126 existing businesses to go "green."

1127 a) Promote environmental business practices to reduce energy use, reduce water use, and increase
1128 recycling and composting, as provided in this chapter.

1129 b) Promote Downtown as a recognized location for businesses and institutions that are committed to
1130 environmental sustainability, by working with developers, real estate brokers, local companies,
1131 the University of California the Convention and Visitors Bureau, and the Downtown Business
1132 Association. As part of this effort, develop a marketing plan to attract green enterprises by
1133 focusing on:

1134 – Berkeley's reputation for environmental innovation, education, research, and
1135 entrepreneurship, and

- 1136 – Downtown's transit-accessible location and green practices. (See other Policies in this
1137 chapter.)
- 1138 c) Encourage Downtown businesses to be certified under Alameda County's green business
1139 program.
- 1140 **Policy ES-2.3: Local Food & Businesses.** Promote strategies that connect Downtown residents,
1141 businesses and visitors with local sources of products, services, and healthful foods. (see ED5.1-5.4
- 1142 **Policy ES-2.4: Downtown Energy & Water Facilities.** Consider sustainable infrastructure that can
1143 serve several parcels, or several blocks, in Downtown and abutting areas.
- 1144 a) Consider creating a local electrical "cogeneration" facility to heat buildings with energy that is
1145 usually wasted when generating electricity.
- 1146 b) Consider ground-source heat pumps for heating and cooling multiple buildings in Downtown.
- 1147 c) Consider integrating management of energy systems among multiple buildings to optimize total
1148 energy demand.
- 1149 d) Consider incentives and institutional cooperation to promote greywater recycling systems that
1150 serve multiple properties and/or the larger Downtown Area. In partnership with the University,
1151 give consideration to a water-recycling plant to make water available for the irrigation of City and
1152 University landscaping.
- 1153 e) Offer Downtown businesses and residents energy conservation auditing and advice on energy
1154 retrofits at little or no cost, and possibly in cooperation with PG&E.
- 1155 **Policy ES-2.5: Environmental Leadership.** The City of Berkeley should demonstrate leadership in
1156 environmental sustainability through its own actions.
- 1157 a) Make "green infrastructure" improvements to promote stormwater quality and help restore natural
1158 systems (see ES-5.1-5.5 and OS-2.1-2.5, and Figure OS-##, Green Stormwater Infrastructure
1159 Concept).
- 1160 b) Evaluate the performance of City buildings in the Downtown Area, and formalize a program to
1161 continue energy- and water-conserving retrofits for such buildings.
- 1162 c) Develop and adopt a model program to certify City facilities, both owned and leased, for green
1163 building operations and maintenance.
- 1164 d) The City should encourage property owners from whom it leases space, to make water and
1165 energy efficiency improvements. Consider establishing standard lease agreement provisions.
- 1166 e) Consider a model affordable housing and green building project on the City-owned Berkeley Way
1167 parking lot site (see LU-2.2 and HC-4.2).

1168 **GOAL ES-3: ENCOURAGE HIGH DENSITY, HIGHLY LIVABLE DEVELOPMENT TO TAKE**
1169 **ADVANTAGE OF DOWNTOWN'S PROXIMITY TO REGIONAL TRANSIT AND TO IMPROVE THE**
1170 **AVAILABILITY OF DIVERSE WALK-TO DESTINATIONS -- SUCH AS RETAIL, SERVICES,**
1171 **CULTURE, AND RECREATION.**

1172 **Policy ES-3.1: Land Use.** Encourage development with high intensities in close proximity to transit,
1173 and encourage a mix of land uses that allows most daily needs to be met on foot. (See Land Use
1174 chapter.)

1175 **Policy ES-3.2: Streets and Open Space.** Make major enhancements and additions to sidewalks,
1176 parks, plazas, midblock pedestrian walkways, streets, and other open space, and incorporate
1177 ecologically beneficial features. (See Streets & Open Space chapter.)

1178 **Policy ES-3.3: Urban Design.** Encourage exceptional, high-quality new architecture, and minimize
1179 noise, wind, glare and other impacts from development. (See Historic Preservation & Urban Design
1180 chapter and Housing and Community Health & Services chapter.)

1181 **Policy ES-3.4: Alternative Modes.** Enhance and expand transit service, walking and bicycle use, as
1182 an alternative to the use and ownership of private vehicles. (See Access chapter.)

1183 **Policy ES-3.5: Pedestrian Priority.** Streets and other public improvements and programs, should
1184 give pedestrians priority in Downtown. (See Access chapter.)

1185 **GOAL ES- 4: PROMOTE "GREEN" BUILDINGS.**

1186 **Policy ES- 4.1: Energy Efficiency & Generation.** Promote highly energy-efficient buildings and on-
1187 site energy generation through design and construction techniques.

1188 a) For new construction and substantial renovations, establish development requirements and/or
1189 incentives for energy performance that significantly exceeds State of California Title 24 design
1190 standards. Also establish preferred development practices through amendments to the
1191 Downtown Design Guidelines (see HD-##) and, where appropriate, through revised Zoning
1192 standards. Energy efficiency provisions should vary by building type, in recognition of the unique
1193 opportunities and constraints associated with each. Coordinate Downtown initiatives with citywide
1194 provisions. Consider requirements and incentives for new buildings to incorporate energy
1195 prerequisites for Green Building rating systems such as US Green Building Council's "Leadership
1196 in Energy and Environmental Design" (LEED), GreenPoints rated, or equivalent requirements
1197 adopted by the City.

1198 Factors to consider include but are not limited to:

- 1199 – reuse of buildings or portions of buildings;
- 1200 – super insulated walls, windows, and doors;
- 1201 – daylighting interiors;
- 1202 – passive solar heating;
- 1203 – efficient appliances and equipment;

- 1204 – making the use of stairways a more inviting alternative to the use of elevators, especially
1205 between floors in commercial buildings;
- 1206 – "smart-metering" to capture detailed energy usage information about a building or unit, and
1207 communicate it back to occupants; and
- 1208 – credit for energy performance features not recognized by Title 24 -- such as the use of
1209 natural ventilation and providing on-site renewable energy generation.
- 1210 d) Emphasize performance-based measures and avoid rigid requirements that could conflict with
1211 other objectives (e.g., strict standards for larger windows would increase daylight indoors but
1212 increase indoor heating and cooling because walls insulate better).
- 1213 e) Encourage the University of California, Berkeley, to further strengthen and apply standards for
1214 energy efficiency, to be implemented by any project the University undertakes, including projects
1215 in the Downtown Area. In 2009, University policy required that new construction projects
1216 outperform California's Title 24 by a minimum of 20%, and strives to achieve a minimum energy
1217 efficiency standard equivalent to the energy prerequisites needed to attain LEED Silver (as
1218 defined by the US Green Building Council's "Leadership in Energy and Environmental Design"
1219 program).
- 1220 f) Consider requiring or encouraging commercial properties to use the Energy Star Portfolio
1221 Manager to track building energy use and benchmark performance.
- 1222 g) Consider requiring or encouraging an energy efficiency rider for commercial properties, such as
1223 the Building Owner and Manager Association's (BOMA) green lease to encourage owners to
1224 invest in energy efficiency measures.
- 1225 h) Encourage evaluation of whole-energy performance, throughout the building design process.
1226 Encourage projects to undergo whole-building energy performance modeling by a Professional
1227 Engineer (PE) during design development, by using services such as the "Savings By Design"
1228 program made available at no costs by PG&E.
- 1229 i) Provide adequate natural light in residential units (see HC-2.1 and HD-4.2).
- 1230 j) After construction, verify that building elements and systems have been designed, installed,
1231 calibrated, and performing as designed. The City should identify appropriate methods for
1232 verification.
- 1233 k) Consider incentives for on-site generation of renewable energy, and additional incentives for
1234 projects that demonstrate "state of the art" methods, such as "zero-carbon" buildings that offset
1235 greenhouse-gas emissions by generating energy on-site (see LU-8.2).
- 1236 l) Expand electric car and hybrid plug-in locations (see AC-3.6).
- 1237 m) Consider requiring that owners of new apartment buildings disclose the "green-rating" of
1238 buildings, including average energy used per unit and per square foot.

1239 n) Consider restricting interior lighting of commercial space during hours of low use, such as at
1240 night.

1241 o) Consider City incentives for zero-emissions projects that demonstrate "state of the art" methods
1242 for energy efficiency and the generation of electricity.

1243 **Policy ES-4.2: Comprehensive Performance.** Buildings should have a high level of environmental
1244 performance across a spectrum of concerns, such as those identified by LEED for proximity to transit,
1245 stormwater design (see ES-5.3), water conservation (see ES-4.3), energy efficiency and generation
1246 (see ES-4.1), waste management (see ES-6.1), green materials (see ES-4.4) and material reuse
1247 (see ES-6.1 and 6.2), indoor environmental quality (see ES-4.4), etc..

1248 a) For new construction and substantial renovations establish development requirements and/or
1249 incentives for performance equivalent to LEED Gold or its Build It Green equivalent (see LU-##).
1250 Also establish preferred development practices through amendments to the Downtown Design
1251 Guidelines (see also HD-4.1) and, where appropriate, through revised Zoning provisions.
1252 Coordinate Downtown initiatives with the development of citywide provisions.

1253 b) Encourage the University of California, Berkeley, to strengthen and apply standards for
1254 environmental performance not directly related to energy, to University projects in the Downtown
1255 Area. As of 2009, the University strives to attain an overall standard for certification as LEED
1256 Silver.

1257 c) Develop City targets for building operations and maintenance, and encourage the attainment of
1258 these targets by property owners and tenants. Consider performance measures established by
1259 LEED, Alameda County Waste Management Authority (Stopwaste) and Build It Green.
1260 Coordinate Downtown initiatives with the development of citywide provisions.

1261 **Policy ES-4.3: Water Conservation & Reuse.** Promote best practices for substantial water
1262 conservation and water re-use as part of new construction, renovations, and site improvements and
1263 landscaping.

1264 a) Establish development requirements and/or incentives for performance in this area (see ES-4.2).

1265 b) Work with East Bay Municipal Utility Districts to provide incentives for the installation and/or
1266 replacement of water fixtures for greater efficiency.

1267 c) Encourage the use of innovative water conservation technologies, such as waterless urinals and
1268 water reuse, through the development of local guidelines and/or alternative building code
1269 requirements.

1270 d) Encourage the use of cisterns and other devices that retain and make use of rainwater (see ES-
1271 5.1 and 5.3, and OS 3.1).

1272 e) Encourage water recycling through the use of graywater for flushing toilets, irrigation, and other
1273 purposes, by working to reform existing regulations that may discourage such practices, and by
1274 developing guidelines to illustrate opportunities and design considerations.

1275 **Policy ES-4.4: Green Materials.** Encourage use of environmentally preferable materials for building
1276 construction and maintenance for: maintaining healthful indoor air quality; reducing harmful
1277 exposures to harmful materials during their production; installation and disposal; protecting species
1278 that are threatened or endangered; and reducing consumption of natural resources (see ES-4.2).

1279 a) Establish building requirements and/or incentives for performance in these areas (see ES-4.2).

1280 b) Inform builders and landowners of standards and guidelines for preferable construction products,
1281 such as those developed by LEED, Green Seal, Stopwaste, and the Healthy Building Network.

1282 c) Encourage reused, reclaimed or recycled materials, and wood products that are harvested
1283 responsibly, such as those certified by the Forest Steward Council (FSC) by providing builders
1284 with information on these options.

1285 d) Encourage preferable construction materials by developing a new "green building materials
1286 checklist" for Downtown projects. Consider creating a "worst in class" list of materials to avoid.
1287 Consider incentives for construction projects that conform significantly to this checklist.

1288 e) Inform building owners and building managers of standards and guidelines for preferable
1289 maintenance products and operations, such as integrated pest management, environmentally
1290 preferable purchasing and waste reduction strategies.

1291 **Policy ES-4.5: Noise.** Evaluate and strengthen noise mitigation measures for preventing and
1292 eliminating noise as appropriate to Downtown's active mixed-use environments (see HC-2.2).

1293 **Policy ES-4.6: Longevity.** Promote buildings and features that require less frequent maintenance or
1294 replacement.

1295 a) Amend the Downtown Design Guidelines to encourage architectural and site features that use
1296 durable materials and are detailed to be long lasting (see HD-4.1).

1297 b) Provide public education and technical assistance to encourage private builders to factor mid-
1298 and long-term "life-cycle costs" in the design of buildings. Green buildings generally have lower
1299 on-going operating costs that should be factored when considering up-front capital investments
1300 for green features.

1301 c) Encourage life-cycle analysis of long-term maintenance and replacement costs for building and
1302 site features, such as by making such an analysis part of a new "green building material checklist.

1303 **Policy ES-4.7: Solar & Wind Impacts.** Design and locate new buildings to avoid significant adverse
1304 solar- or wind-related impacts on important public open spaces (see LU 3.2 and HD 4.2).

1305 **Policy ES-4.8: Adaptive Reuse.** Encourage adaptive reuse of older buildings by promoting their
1306 rehabilitation, and allow intensification, where appropriate (see HD-1.1 and ED 1.3).

1307 **GOAL ES-5: PROMOTE ECOLOGICALLY BENEFICIAL LANDSCAPING AND STORMWATER**
1308 **FEATURES THROUGHOUT THE DOWNTOWN, TO IMPROVE THE QUALITY OF URBAN**
1309 **RUNOFF IN DOWNTOWN, PROTECT AND RESTORE CONNECTED NATURAL ECOSYSTEMS,**

1310 **REDUCE DOWNSTREAM FLOOD IMPACTS, AND EXPRESS THE COMMUNITY'S COMMITMENT**
1311 **TO ENVIRONMENTAL SUSTAINABILITY.**

1312 **Policy ES-5.1: Stormwater Quality.** New development and public infrastructure should protect and
1313 improve ecological quality and functions relating to stormwater, by treating urban runoff, retaining
1314 stormwater, and attaining no net increase in runoff from Downtown. (see Goal OS 2)

1315 a) Develop a comprehensive strategy for Downtown that provides for the retention of stormwater
1316 and, to the extent feasible, the recharge of local aquifers. Consider this as part of a new Streets
1317 & Open Space Improvements Plan. (see OS-1.1 .) The strategy should look beyond the
1318 boundaries of Downtown to consider issues and opportunities comprehensively, and should
1319 engage the University of California as a partner in this process.

1320 b) Design public improvements, including streets, parks and plazas, to include appropriate "best
1321 management practices," such as for retention and infiltration of urban runoff by diverting urban
1322 runoff (which contains waterborne pollutants) to bio-filtration systems (such as landscaped
1323 swales), and infiltration areas (at-grade and/or below-grade). Specific opportunities include:
1324 streets where travel lanes might be eliminated, median strips that might be retrofitted or widened,
1325 parks, and plazas (see OS 1.2).

1326 c) Encourage the University to explore opportunities for incorporating best management practices
1327 for urban places along the western edge of the Campus, such as on "the Crescent" (see OS-1.2).

1328 d) Develop design guidelines and development standards (see OS 3.1) to encourage appropriate
1329 "best management practices" for urban runoff retention and infiltration as part of private and
1330 institutional development projects, by diverting rainwater to:

1331 – landscaped retention features (such as swales or "rain gardens"),

1332 – permeable paving,

1333 – "green roofs,"

1334 – below-grade "dry wells," and

1335 – rooftop and/or below-grade cisterns.

1336 p) Consider the use of dry wells and cisterns as an emergency source of water, if East Bay
1337 Municipal Utility District (EBMUD) service is interrupted.

1338 **Policy ES-5.2: Ecological Landscaping.** Promote extensive landscaping and best practices for
1339 landscaping that benefit and help restore natural systems throughout the Downtown Area.

1340 a) Develop a Streets & Open Space Improvements Plan (see OS-1.1 and 1.2) and guidelines that
1341 incorporate landscaping, naturalized features and permeable paving, such as by establishing a
1342 Center Street Plaza that models sustainable design , daylighting Strawberry Creek in or next to
1343 MLK Civic Center Park , or including larger ecological features in the design of the Park Blocks).
1344 As part of the SOSIP, provide a program for significant near-term "greening" of Downtown.

- 1345 b) Develop a street tree master plan that is associated with a new Streets & Open Space
 1346 Improvements Plan and selects appropriate tree and plant species for Downtown's streets and
 1347 open spaces. Consider the use of native tree species.
- 1348 c) All street tree installations should be accompanied by appropriate soil and drainage to encourage
 1349 each tree's healthy maturation.
- 1350 d) On public land, maintain healthy mature trees wherever possible (see OS-2.3). Permit the
 1351 elimination of mature trees in instances of disease, public safety, or overriding public benefits.
 1352 Establish clear criteria for the retention of trees and the replacement of trees for instances when
 1353 tree removal is unavoidable. Permit the elimination of trees only after findings have been made
 1354 according to established criteria and only after opportunities for public comment, except in cases
 1355 when unsafe conditions or property damage may result.
- 1356 e) Establish new and strengthen existing landscaping standards and guidelines for substantial water
 1357 conservation and recycling in new landscaping and retrofits Also specify appropriate plants for
 1358 use Downtown, and ways to reduce waste, nourish the soil, conserving energy, and protect water
 1359 and air quality. When developing these provisions, consider guidelines used by the City's
 1360 municipal projects and Stopwaste's "Bay Friendly Guidelines" (www.stopwaste.org) (see OS-2.5).
- 1361 **Policy ES-5.3: On-Site Features.** Promote beneficial landscaping and other open space features as
 1362 part of private development.
- 1363 a) Amend the Downtown Design Guidelines to promote additional greenery and environmentally
 1364 beneficial features on-site (see OS-3.1).
- 1365 b) Private development should expand and enhance on-site open space and landscaping, and
 1366 promote their use to address urban runoff and drainage issues (see LU-8.1, LU-8.2 and OS3.1).
- 1367 **Policy ES-5.4: Natural Areas on UC Campus.** Encourage the University to maintain and enhance
 1368 natural areas adjacent to Downtown, such as surrounding Strawberry Creek (see OS-1.2).
- 1369 **GOAL ES-6: MINIMIZE WASTE GENERATED DOWNTOWN, AND STRIVE TO MAKE**
 1370 **DOWNTOWN A "ZERO WASTE ZONE."**
- 1371 **Policy ES-6.1: Recycling & Reuse.** Maximize recycling and reuse opportunities for Downtown
 1372 residents, workers, visitors, businesses, and institutions.
- 1373 a) Promote on-site recycling by apartment and condominium dwellers and businesses.
- 1374 b) Educate building, owners, managers and tenants about techniques for on-site recycling, local
 1375 recycling programs and State "recycling plan" requirements.
- 1376 c) Require sufficient space for receptacles in new construction.
- 1377 d) Develop guidelines for accessible storage and collection areas for the separation and collection of
 1378 recyclable materials.

1379 e) Maintain and enhance existing programs for receiving and processing restaurant compostables.

1380 f) Expand recycling receptacles on street and in other public open spaces, and provide for their
1381 continued maintenance. Evaluate opportunities for composting receptacles on street and in other
1382 public open spaces, and consider their implementation.

1383 g) Encourage recycling programs through the University, BUSD, and other institutions.

1384 **Policy ES-6.2: Adaptive Reuse.** Encourage adaptive reuse of older buildings (see HD-1.1 and HD-
1385 1.2).

1386 **GOAL ES-7. CONTINUOUSLY IMPROVE CITY STANDARDS AND PROGRAMS PROMOTING**
1387 **SUSTAINABLE PRACTICES.**

1388 **Policy ES-7.1: Continuous Improvement.** Regularly evaluate sustainability programs and
1389 standards, using environmental, social and economic measures in relation to sustainability practices
1390 and progress Downtown.

1391 a) As part of the Climate Action Plan, establish progress indicators and regularly assess progress
1392 being made on aforementioned policies and measures. Based on assessments, recommend
1393 revisions to improve performance.

