

City of Las Vegas Sustainability Policies and Codes

Resolutions and Agreements

- U.S. Mayor's Climate Protection Agreement (2005) – Mayor Oscar Goodman, signatory
- Climate Protection Resolution (R-57-2006) – August 2, 2006
- Green Building Resolution (R-81-2006) – October 18, 2006
- Green Building Special Revenue Fund (R-19-2012) – March 21, 2012
- Urban Forestry Resolution (R-26-2008) – May 7, 2008
- Sustainable Energy Strategy (R-50-2008) – September 3, 2008

City of Las Vegas Master Plan

- [Conservation Element of the 2020 Las Vegas Master Plan](#)
- [Food Access Policy and Planning Guide](#)

Southern Nevada Regional Planning Coalition – Tree Guidelines

- Regional Plant List
- Best Practices for Urban Trees
- Regional Fruit and Vegetable Plant List

Las Vegas Municipal Code

- **Title 6 – Business Taxes, Licenses, and Regulations**
 - Chapter 6.67: Public Utilities (Governs NV Energy and Southwest Gas franchise agreements)
 - Chapter 6.90: Farmers' Markets
- **Title 9 – Health and Safety**
 - Chapter 9.08: Solid Waste Management (Governs Republic Services for waste management and recycling)
- **Title 11 – Vehicles and Traffic**
 - Chapter 11.40: Bicycles
- **Title 14 – Public Services**
 - Chapter 14.10: Drought Plan
 - Chapter 14.18: Stormwater Management
- **Title 19 – Unified Development Code**
 - 19.00.030.N: Purpose and Intent: To promote the implementation of the "Sustaining Las Vegas" Policy, Sustainable Energy Strategy and Climate Protection resolution of the City.
 - Chapter 19.04: Complete Street Standards
 - Chapter 19.12: Permissible Uses: Small Wind Energy System (See Page 377-379)
 - Chapter 19.12: Permissible Uses: Solar Panel
 - Description: A small-scale unit that is designed and used, on an incidental or accessory basis, to generate power or heat (or both) to be supplied to the principal use of the site. This use:
 1. Does not include an "electric generating plant" or any other utility facility that is specifically defined in LVMC Chapter 19.18; and
 2. Shall not be deemed an accessory structure for purposes of the standards of this Title that govern accessory structures.
 - Conditional Use Regulations:

1. When visible from a public right-of-way, solar panels shall be installed so that they project no more than 40 inches from the roof surface.
2. When mounted on a sloped roof, the enclosure cladding and support structure of solar panels (excepting the solar collection cells) shall match the roof in color and appearance.
3. Roof-mounted hot water storage systems shall not be visible from neighboring properties or public rights-of-way.
4. Within an area designated as an Historic District, the location of the proposed unit must first be reviewed and approved pursuant to LVMC 19.10.150.



The U.S. Mayors Climate Protection Agreement

(As endorsed by the 73rd Annual U.S. Conference of Mayors meeting, Chicago, 2005)

- A. We urge the federal government and state governments to enact policies and programs to meet or beat the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012, including efforts to: reduce the United States' dependence on fossil fuels and accelerate the development of clean, economical energy resources and fuel-efficient technologies such as conservation, methane recovery for energy generation, waste to energy, wind and solar energy, fuel cells, efficient motor vehicles, and biofuels;
- B. We urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that 1) includes clear timetables and emissions limits and 2) a flexible, market-based system of tradable allowances among emitting industries; and
- C. We will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities such as:
 - 1. Inventory global warming emissions in City operations and in the community, set reduction targets and create an action plan.
 - 2. Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities;
 - 3. Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit;
 - 4. Increase the use of clean, alternative energy by, for example, investing in "green tags", advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology;
 - 5. Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money;
 - 6. Purchase only Energy Star equipment and appliances for City use;
 - 7. Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system;
 - 8. Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel;
 - 9. Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production;
 - 10. Increase recycling rates in City operations and in the community;
 - 11. Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO₂; and
 - 12. Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.

**RESOLUTION IN SUPPORT OF GOVERNMENTAL ACTION
TO REDUCE GLOBAL WARMING POLLUTION**

WHEREAS, the Inter-Governmental Panel on Climate Change, the international community's most respected assemblage of scientists, has found that climate disruption is a reality and that human activities are largely responsible for increasing concentrations of global warming pollution; and

WHEREAS, there is broad agreement among the worldwide scientific community that increasing emissions of carbon dioxide, methane and other greenhouse gases released to the atmosphere are affecting the earth's climate; and

WHEREAS, the U.S. Conference of Mayors has previously adopted the U.S. Mayors Climate Protection Agreement calling for cities, communities and the federal government to take actions to reduce global warming pollution; and

WHEREAS, actions to reduce greenhouse gas emissions such as energy conservation and development of renewable energy sources may have multiple benefits, including economic development, job creation, cost savings and improved air quality that are not limited to individual state boundaries; and

WHEREAS, regional technical and policy collaboration to address climate change and reduce greenhouse gas emissions can build upon individual state efforts by coordinating and combining available resources, enhancing communication and dialogue, and promoting and advancing clean energy technologies that are economically and environmentally beneficial to the City of Las Vegas; and

WHEREAS, recent, well-documented impacts of climate disruption include average global sea level increases of four to eight inches during the 20th century; a 40 percent decline in Arctic sea-ice thickness; and nine of the ten hottest years on record occurring in the past decade; and

WHEREAS, climate disruption of the magnitude now predicted by the scientific community will cause extremely costly disruption of human and natural systems throughout the world including: increased risk of floods or droughts; sea-level rises that interact with coastal storms to erode beaches, inundate land, and damage structures; more frequent and extreme heat waves;

1 more frequent and greater concentrations of smog; and

2 WHEREAS, on February 16, 2005, the Kyoto Protocol, an international agreement
3 to address climate disruption, went into effect in the 141 countries that have ratified it to date, and
4 38 of those countries are now legally required to reduce greenhouse gas emissions on average 5.2
5 percent below 1990 levels by 2012; and

6 WHEREAS, the United States of America, with less than five percent of the world's
7 population, is responsible for producing approximately 25 percent of the world's global warming
8 pollutants; and

9 WHEREAS, the Kyoto Protocol emissions reduction target for the U.S. would have
10 been 7 percent below 1990 levels by 2012; and

11 WHEREAS, many leading U.S. companies that have adopted greenhouse gas
12 reduction programs to demonstrate corporate social responsibility have also publicly expressed
13 preference for the U.S. to adopt precise and mandatory emissions targets and timetables as a means
14 by which to remain competitive in the international marketplace, to mitigate financial risk and to
15 promote sound investment decisions; and

16 WHEREAS, state and local governments throughout the United States are adopting
17 emission reduction targets and programs, and such leadership efforts are bipartisan, coming from
18 Republican and Democratic governors and mayors alike; and

19 WHEREAS, many cities throughout the nation, both large and small, are reducing
20 global warming pollutants through programs that provide economic and quality of life benefits such
21 as reduced energy bills, green space preservation, air quality improvements, reduced traffic
22 congestion, improved transportation choices, and economic development and job creation through
23 energy conservation and new energy technologies; and

24 WHEREAS, the City of Las Vegas has identified as a strategic priority to create,
25 integrate, and manage orderly and sustainable development and growth of the community; and

26 WHEREAS, the City is a leader in the reduction of greenhouse gas emissions through
27 the use of alternative fuel vehicles, with 87% of the City's non-emergency fleet running on
28 alternative fuels and comprising a significant portion of the 7,000 alternative fuel vehicles operating

1 in Southern Nevada; and

2 WHEREAS, the City provides incentives and subsidies to employees who commute
3 by mass transit, van pool or car pool, has increased employee enrollment in the Club Ride Program
4 in May of 2006 by 18%, and is recognized by the EPA as one of America's "Best Workplaces for
5 Commuters"; and

6 WHEREAS, all new public facilities to be built by the City will be built to meet or
7 exceed the standards of the United States Green Building Council LEED-Silver rating scale
8 requirements; and

9 WHEREAS, the City actively promotes the development of mass transit options
10 throughout the City and the Southern Nevada region including light rail, monorail, bus rapid transit
11 and a super speed train connecting Las Vegas with Primm, Nevada and ultimately with Barstow and
12 Anaheim, California; and

13 WHEREAS, the City actively promotes the creation and maintenance of open space
14 through the implementation of the Conservation, Parks and Recreational Trails Elements of the Las
15 Vegas Master Plan 2020; and

16 WHEREAS, the City actively promotes the planting of trees and for thirteen years
17 has been recognized as a "Tree City USA" by the National Arbor Day Foundation; and

18 WHEREAS, mayors from around the nation have signed the U.S. Mayors Climate
19 Protection Agreement which, as amended at the 73rd Annual U.S. Conference of Mayors meeting,
20 reads as follows:

21 **The U.S. Mayors Climate Protection Agreement**

22 **A. We urge the federal government and state governments to enact policies and programs to**
23 **meet or beat the target of reducing global warming pollution levels to 7 percent below 1990**
24 **levels by 2012, including efforts to: reduce the United States' dependence on fossil fuels and**
25 **accelerate the development of clean, economical energy resources and fuel-efficient**
26 **technologies such as conservation, methane recovery for energy generation, waste to energy,**
27 **wind and solar energy, fuel cells, efficient motor vehicles, and biofuels;**

28 **B. We urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that**

1 includes 1) clear timetables and emissions limits and 2) a flexible, market-based system of
2 tradable allowances among emitting industries; and

3 C. We will strive to meet or exceed Kyoto Protocol targets for reducing global warming
4 pollution by taking actions in our own operations and communities such as:

- 5 1. Inventory global warming emissions in City operations and in the community,
6 set reduction targets and create an action plan;
- 7 2. Adopt and enforce land-use policies that reduce sprawl, preserve open space,
8 and create compact, walkable urban communities;
- 9 3. Promote transportation options such as bicycle trails, commute trip reduction
10 programs, incentives for car pooling and public transit;
- 11 4. Increase the use of clean, alternative energy by, for example, investing in "green
12 tags," advocating for the development of renewable energy resources,
13 recovering landfill methane for energy production, and supporting the use of
14 waste to energy technology;
- 15 5. Make energy efficiency a priority through building code improvements,
16 retrofitting city facilities with energy efficient lighting and urging employees to
17 conserve energy and save money;
- 18 6. Purchase only Energy Star equipment and appliances for City use;
- 19 7. Practice and promote sustainable building practices using the U.S. Green
20 Building Council's LEED program or a similar system;
- 21 8. Increase the average fuel efficiency of municipal fleet vehicles; reduce the
22 number of vehicles; launch an employee education program including anti-
23 idling messages; convert diesel vehicles to bio-diesel;
- 24 9. Evaluate opportunities to increase pump efficiency in water and wastewater
25 systems; recover wastewater treatment methane for energy production;
- 26 10. Increase recycling rates in City operations and in the community;
- 27 11. Maintain healthy urban forests; promote tree planting to increase shading and
28 to absorb CO₂; and

1 **12. Help educate the public, schools, other jurisdictions, professional associations,**
2 **business and industry about reducing global warming pollution.**

3 NOW, THEREFORE BE IT RESOLVED, that the City Council of the City of Las
4 Vegas endorses the U.S. Mayors Climate Protection Agreement and will continue to be a leader in
5 the reduction of greenhouse gas emissions through:

- 6 ● Continuing to increase the percentage of vehicles that use alternative fuel in the City's
7 non-emergency fleet.
- 8 ● Expanding the availability and use of mass transit for the employees, residents and visitors
9 of the City.
- 10 ● Developing neighborhood parks in areas with deficient service levels and develop
11 mini-parks/urban parks in areas of high density.
- 12 ● Requiring that new residential development provide adequate neighborhood parks as
13 development occurs.
- 14 ● Improving streetscape enhancements in the highly urbanized areas of the City.
- 15 ● Maintaining recognition by the National Arbor Day Foundation as a Tree City USA.
- 16 ● Establishing programs and incentives to encourage builders and developers to implement
17 green building practices.

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- 1 • Encouraging the Clark County Board of County Commissioners, and the Mayors of
2 Henderson, North Las Vegas, Boulder City and Mesquite to support the U.S. Mayors
3 Climate Protection Agreement.
- 4 • Promoting the efforts of the City in reducing greenhouse gas emissions.

5 PASSED, ADOPTED, AND APPROVED this 2nd day of AUGUST, 2006.

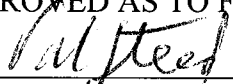
6 CITY OF LAS VEGAS

7
8 BY 
9 OSCAR B. GOODMAN, Mayor

10 ATTEST:

11 
12 BARBARA JO RONEUMUS, City Clerk

13 APPROVED AS TO FORM

14  7-19-06
15 Date

**RESOLUTION ADOPTING THE CITY OF LAS VEGAS
GREEN BUILDING PROGRAM**

WHEREAS, the City has identified as strategic priorities to create, integrate, and manage orderly and sustainable development and growth of the community; to support and encourage sustainability, livability, and pride in the City's neighborhoods; and to promote healthy lifestyles for all segments of the community; and

WHEREAS, the City has adopted a Climate Protection Resolution calling for the City to establish programs and incentives to encourage builders and developers to implement green building practices, which incorporate building design, construction, and maintenance to promote more energy-efficient, environmentally friendly, and sustainable building practices; and

WHEREAS, the City has adopted the 2003 International Energy Conservation Code, which establishes energy use requirements; and

WHEREAS, the City in the near future will adopt the 2006 version of the International Energy Conservation Code, which will establish some of the most stringent energy use requirements in the United States; and

WHEREAS, the City is an active member of the United States Green Building Council (USGBC); and

WHEREAS, the City is a leader in the reduction of greenhouse gas emissions through the use of alternative fuel vehicles, with 87% of the City's non-emergency fleet running on alternative fuels and comprising a significant portion of the 7,000 alternative fuel vehicles operating in Southern Nevada; and

WHEREAS, the City provides incentives and subsidies to employees who commute by mass transit, van pool or car pool; has increased employee enrollment in the Club Ride Program in May of 2006 by 18%; and is recognized by the EPA as one of America's "Best Workplaces for Commuters"; and

WHEREAS, the City actively promotes the development of mass transit options throughout the City and the Southern Nevada region including light rail, monorail, Bus Rapid Transit and a Super Speed Train connecting Las Vegas with Primm, Nevada and ultimately with Barstow and

1 Anaheim, California; and

2 WHEREAS, the City actively promotes the creation and maintenance of open space
3 through the implementation of the Conservation, Parks and Recreational Trails Elements of the Las
4 Vegas Master Plan 2020; and

5 WHEREAS, the City actively promotes the planting of trees, and for thirteen years has
6 been recognized as a "Tree City USA" by the National Arbor Day Foundation; and

7 WHEREAS, it is the intent of the City Council that the construction of all new public
8 facilities by or for the City will meet or exceed the standards of the LEED-Silver rating scale, as
9 promulgated by the USGBC, or standards that are deemed equivalent; and

10 WHEREAS, establishing a "Green Building Program" for development within the City
11 furthers the City's commitment to achieving a sustainable community; and

12 WHEREAS, over 700 homes will be built in the City by the end of 2006 as part of the
13 Southern Nevada Water Authority's Water Smart Home Program; and

14 WHEREAS, the Nevada Energy Star Partners are currently developing more than 50
15 active subdivisions in the City; and

16 WHEREAS, the Southern Nevada Home Builders Association has developed the
17 Southern Nevada Green Building Partnership to encourage residential builders to adopt and expand
18 green building practices; and

19 WHEREAS, the City has partnered with the Southern Nevada Home Builders
20 Association throughout the planning and development of the Southern Nevada Green Building
21 Partnership; and

22 WHEREAS, homes built as part of the Southern Nevada Green Building Partnership
23 will be built to exceed the energy and water use requirements of the City; and

24 WHEREAS, homes built as part of the Southern Nevada Green Building Partnership
25 will further include a quantifiable volume of renewable and recycled-content materials used in
26 construction; and

27 WHEREAS, those who purchase a home that is part of the Southern Nevada Green
28 Building Partnership will receive educational materials to help them achieve an even more sustainable

lifestyle; and

WHEREAS, the City should further commit to a policy of green building for all public buildings built by and for the City.

NOW, THEREFORE BE IT RESOLVED by the City Council of the City of Las Vegas as follows:

1. The City of Las Vegas Green Building Program is hereby adopted.
2. All homes built in the City and certified as meeting the requirements of the Southern Nevada Green Building Partnership will be recognized in the City's Green Building Program.
3. Builders participating in the Southern Nevada Green Building Partnership will be listed in a Green Building section on the City's website and will be provided with information on the City's Green Building program for their sales offices and model homes.
4. Each participating home will be given a certificate and window sticker to authenticate its participation.
5. The City will continue to work with the Southern Nevada Green Building Partnership to ensure that this remains a dynamic and responsive program for the City, its residents and the development community.
6. The City will use its best efforts to ensure that all public buildings built by and for the City are built to USGBC's LEED-Silver level or other equivalent standard, as identified by the Director of the Nevada State Office of Energy.
7. Beginning with Fiscal Year 2008, the City will dedicate 25% of any incremental increase in the aggregate amount of franchise fees collected from providers of electricity, gas, and solid waste collection services over the aggregate amount of those fees collected in 2007, not to exceed \$2,500,000 in any single year, in order to fund any increased costs associated with the construction of new public buildings, costs for the renovation or maintenance of existing facilities to LEED-Silver level or other equivalent standard, and the funding of green building and sustainability incentives and the development of public education programs. This revenue will be designated as the City's "Green Building Fund."
8. The City Manager is directed and authorized to take necessary actions to implement all

1 aspects of the City's Green Building Program as set forth in this Resolution, including the
2 establishment of a budget for the utilization of the Green Building Fund.

- 3 9. The City will prepare an annual report documenting achievements in increasing the number
4 of green buildings in the City and the resulting environmental benefits, to include savings in
5 energy, reduction in consumptive use of water, reduction in green house gas production, and
6 conservation of natural resources.

7 PASSED, ADOPTED, AND APPROVED this 18TH day of OCTOBER, 2006.

8 CITY OF LAS VEGAS

9
10 BY 
11 OSCAR B. GOODMAN, Mayor

12 ATTEST:

13 
14 BARBARA JO RONEMUS, City Clerk

15 APPROVED AS TO FORM

16 Val Reed 10-4-06
17 Date

1 **AMENDED RESOLUTION ESTABLISHING**
2 **THE GREEN BUILDING SPECIAL REVENUE FUND**

3 WHEREAS, on October 20, 2006, by means of Resolution R-81-2006, the City
4 Council adopted the City of Las Vegas Green Building Program (the "Program"); and

5 WHEREAS, on May 7, 2008, the City Council adopted Resolution R-22-2008, which
6 established the Green Building Special Revenue Fund (the "Fund"); and

7 WHEREAS, as expressed in those resolutions, the Program and the Fund were to be
8 supported with certain franchise fee revenue (the "Franchise Fee Revenue"), described as follows:

9 **Beginning with Fiscal Year 2008, the City will dedicate 25% of any incremental**
10 **increase in the aggregate amount of franchise fees collected from providers of**
11 **electricity, gas, and solid waste collection services over the aggregate amount of**
12 **those fees collected in 2007, not to exceed \$2,500,000 in any single year;**

13 and

14 WHEREAS, the stated purpose of the Fund was to fund "any increased costs
15 associated with the construction of new public buildings, costs for the renovation or maintenance
16 of existing facilities to LEED-Silver level or other equivalent standard, and the funding of green
17 building and sustainability incentives and the development of public education programs"; and

18 WHEREAS, it is the intent of the City Council to set forth additional revenue sources
19 for the Fund, as well as additional purposes for which the Fund may be used and applied.

20 NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY
21 OF LAS VEGAS, AS FOLLOWS:

22 1. In addition to the Franchise Fee Revenue described above, funding sources for the Fund may also
23 include grants, refunds, rebates, donations, energy savings and proceeds from recycled materials
24 (collectively, the "Additional Revenue").

25 2. The purpose of the Franchise Fee Revenue and Additional Revenue is to provide funding for the
26 following:

27 A. Any increased costs associated with the construction of new public buildings that are
28 appropriate for certification to LEED-Silver or equivalent standard;

 B. Any increased costs associated with energy efficient upgrades in the design and
construction of new public buildings or facilities that are not appropriate or eligible for green

1 building certification;

2 C. Construction of renewable energy systems for public buildings and facilities;

3 D. Implementation of energy conservation measures for public buildings and facilities;

4 E. Planning and development of sustainable public facilities and related infrastructure;

5 F. Completion of the goals, objectives and purposes of any accepted grant or rebate
6 program;

7 G. Recycling programs;

8 H. Green building and sustainability incentives; and

9 I. Development of education and outreach programs for City employees and the public
10 generally.

11 3. This Resolution shall replace and supersede Resolution R-22-2008.

12 PASSED, ADOPTED, AND APPROVED this ____ day of _____, 2012.

13 CITY OF LAS VEGAS

14
15 BY _____
CAROLYN G. GOODMAN, Mayor

16 ATTEST:

17 _____
18 BEVERLY K. BRIDGES, MMC
City Clerk

19 APPROVED AS TO FORM

20 Val Steed 3-5-12
Date

**RESOLUTION ADOPTING THE
CITY OF LAS VEGAS URBAN FORESTRY INITIATIVE**

WHEREAS, the City Council recognizes the important role of trees within the urban environment, sometimes referred to as the “urban forest”; and

WHEREAS, the urban forest provides numerous economic, social and environmental benefits; and

WHEREAS, an urban forestry initiative will enhance citizen awareness, build neighborhood unity, foster community pride and promote civic trust; and

WHEREAS, an urban forestry initiative will provide opportunities for public-private partnerships with businesses and nonprofit organizations to maximize resources, expand funding opportunities, and increase the urban tree canopy; and

WHEREAS, the City Council finds it desirable to develop partnerships with public institutions, regulatory agencies and regional bodies to broaden the possibilities for conducting research and analyzing the benefits of the urban forest in this part of the country; and

WHEREAS, an urban forestry initiative will contribute to the City’s long-term sustainability, as trees clean the air, improve stormwater management, conserve energy, improve public health, and increase property values; and

WHEREAS, the City has identified strategic priorities to create, integrate and manage orderly and sustainable development and growth of the community; to support and encourage sustainability, liveability, and pride in the City’s neighborhoods; and to promote healthy lifestyles for all segments of the community; and

WHEREAS, the Conservation Element of the 2020 Master Plan recommends the adoption of an urban forestry program to assure the protection, preservation and maintenance of mature trees, shrubs and decorative plantings within public parks, public rights-of-way and public facilities throughout the City for future generations; and

WHEREAS, on August 27, 2007, the City Council and Planning Commission attended a Joint Workshop on Sustainability; and

WHEREAS, on October 4, 2007, the City Council accepted the Joint Workshop

1 Report, with direction to the Planning and Development Department to develop programs to plant
2 more trees in City rights-of-way and in connection with City facilities, and to provide assistance to
3 businesses and homeowners to plant more trees on private property; and

4 **WHEREAS**, the City Council has adopted a Climate Protection Resolution
5 (R-57-2006) expressing City support for programs and policies that, by 2012, will reduce
6 greenhouse gas emissions nationwide by 7% below 1990 levels; and

7 **WHEREAS**, the City has received recognition as a "Tree City USA" from the Arbor
8 Day Foundation for the past 15 years, and an urban forestry initiative will allow the City to maintain
9 this designation; and

10 **WHEREAS**, the City recently received a \$38,000 grant from the Nevada Division
11 of Forestry, along with a match in the amount of \$10,000 from the Southern Nevada Water
12 Authority, to inventory the urban forest.

13 **NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE**
14 **CITY OF LAS VEGAS** to adopt the City of Las Vegas Urban Forestry Initiative, with the
15 following goals:

- 16 1. Double the average tree canopy coverage to 20% by 2035.
17 2. Work with existing partners and develop new partnerships in order to ensure that urban forestry
18 remains a priority for the City and the Southern Nevada region.
19 3. Prepare an Urban Forest Management Plan.

20 PASSED, ADOPTED, AND APPROVED this 7TH day of MAY, 2008.


21 CITY OF LAS VEGAS

22 BY 
23 OSCAR B. GOODMAN, Mayor

24 ATTEST:

25 
26 BEVERLY K. BRIDGES, CMO
City Clerk

27 APPROVED AS TO FORM

28  4-23-08
Date

**RESOLUTION ADOPTING A SUSTAINABLE ENERGY STRATEGY
FOR THE CITY OF LAS VEGAS**

WHEREAS, the City Council has adopted a Climate Protection Resolution (R-57-2006), making a commitment to be a leader in the reduction of greenhouse gas emissions; and

WHEREAS, the City's "Sustain Las Vegas" Policy promotes the environmentally-responsible, sustainable development of the City by reducing overall energy consumption, developing infrastructure to facilitate sustainable development, and supporting efforts to improve air quality and conserve non-renewable resources; and

WHEREAS, the City Council has accepted a Joint Workshop Report relating to its Workshop on Sustainability, establishing a strategic framework that introduces sustainability into City codes and policies, organizational practices, and community programs;

WHEREAS, a comprehensive sustainable energy strategy will implement the City's Climate Protection Resolution, the "Sustain Las Vegas" Policy, and the Joint Workshop Report by addressing energy conservation and renewable energy in City codes and policies, organizational practices and community programs; and

WHEREAS, such an energy strategy meets the value of "Innovation In Meeting the Present and Future Needs of the City," as set forth in the City's Strategic Plan, as well as the Strategic Priorities of the City Council, which include: to create, integrate, and manage orderly and sustainable development and growth of our community; manage costs and revenue resources to achieve efficient operations; support and encourage sustainability, livability, and pride in our neighborhoods; aggressively attract and retain diverse businesses; promote healthy lifestyles for all segments of the community; and provide a safe environment for our residents, businesses and visitors using a community oriented approach; and

WHEREAS, established City sustainability policy dictates that it is no longer acceptable to allocate public resources based solely on financial analysis, but rather that decisions on energy projects, policies and programs must also take into consideration environmental health, economic strength, and social well-being; and

WHEREAS, the City is facing the possibility of higher energy costs, and renewable

1 energy and energy efficiency can help meet growing energy demands while setting an energy
2 conservation precedent for the region and State; and

3 WHEREAS, energy conservation and the development of renewable energy sources
4 may have benefits for the community and region, including economic development, job creation,
5 municipal cost savings, and improved air quality; and

6 WHEREAS, the City continues to demonstrate leadership in energy strategies by
7 requiring new City buildings to meet or exceed LEED-Silver requirements; participating in
8 EnergyStar programs; installing efficient lighting; managing mechanical systems in buildings;
9 controlling use of machines and electronic equipment; and establishing sustainability committees
10 and programs such as the Green Council, the CELEBRATE Committee, and the Green Building
11 Program.

12 NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Las
13 Vegas as follows:

- 14 1. To adopt the Sustainable Energy Strategy document that is attached to and incorporated into
15 this Resolution;
- 16 2. To take action on renewable energy and energy conservation programs, consistent with
17 established sustainability and climate protection policy; and
- 18 3. To make sure that any such action takes into consideration the following:
 - 19 A. The life-cycle costs and benefits to the environment;
 - 20 B. Quality of life;
 - 21 C. The well-being of citizens and employees;

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1 D. Overall livability as it pertains to the community; and

2 E. The local economy.

3 PASSED, ADOPTED, AND APPROVED this 3rd day of September, 2008.


4 CITY OF LAS VEGAS

5
6 BY 
OSCAR B. GOODMAN, Mayor

7 ATTEST:

8 
9 BEVERLY K. BRIDGES, CMC
City Clerk

10 APPROVED AS TO FORM

11  8-25-08
Date

City of Las Vegas
Sustainable Energy Strategy
September, 2008

Introduction

America's carbon footprint is expanding. With a growing population and an expanding economy, America's settlement area is widening, and as it does, Americans are driving more, building more, consuming more energy, and emitting more carbon. Rising energy prices, growing dependence on imported fuels, and accelerating global climate change make the nation's growth patterns unsustainable.¹

Cities have tremendous influence over growth and development patterns, and therefore cities have the opportunity to provide national and global leadership for these environmental and energy issues. This opportunity is especially pronounced for Las Vegas, a global city known for excess, to become a world leader in municipal energy strategies. Some opportunities and threats to Las Vegas, outlined below, provide insight into why a comprehensive energy strategy should matter to all members of the Las Vegas community today, and why action is called for now.

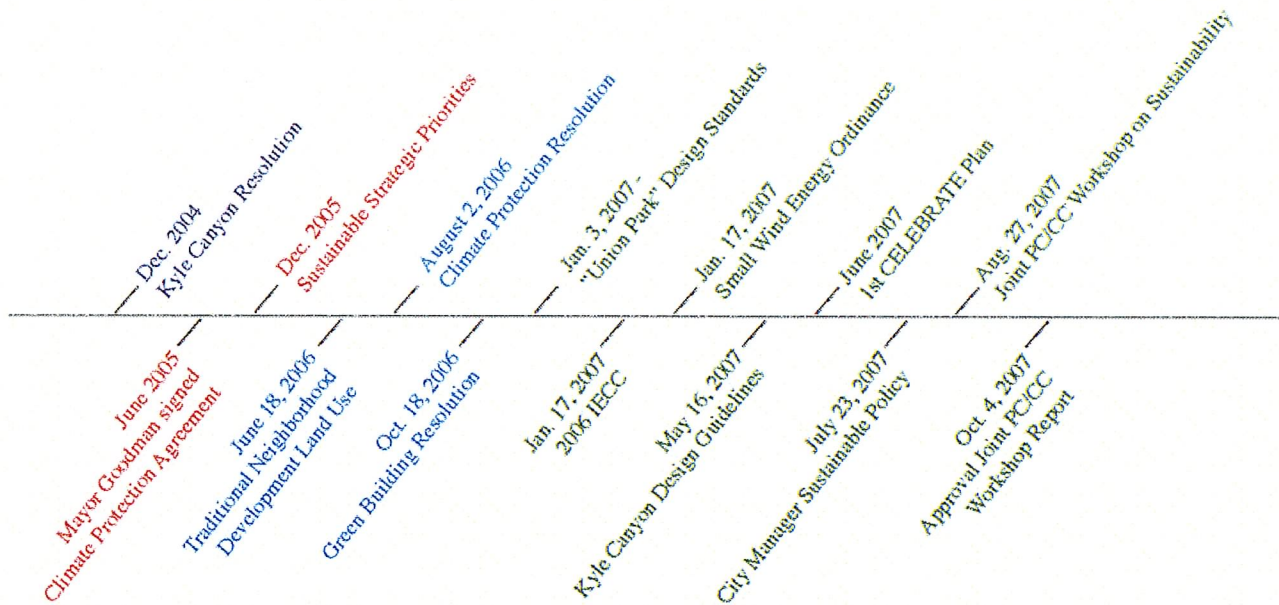
- **Tourism.** Perhaps one of the biggest climate change challenges is to alter the perception that Las Vegas is an unsustainable city. The reality is that Southern Nevada is a leader in solar energy, energy efficient buildings and use of cleaner burning alternative fuels for transportation, and the city of Las Vegas is becoming known as one of America's leading sustainable cities. Promoting the city's sustainability could have a positive impact on tourism. According to a 2007 study conducted by the BBC, greater than 70% of people in developed countries believe major steps should be taken to address climate change. A 2007 study in the U.S. conducted by the Yale Center for Environmental Law and Policy found that 83% of Americans believe global warming is a serious problem, and 81% believe they have a responsibility to reduce the impacts of global warming. These numbers are trending up rapidly, and could impact attitudes and perceptions about spending tourist dollars in Las Vegas. Becoming known as a world leader in energy conservation and renewable energy will turn this threat into opportunity as people from around the world come to see, experience and learn from Las Vegas.
- **Economic Growth.** "Green-collar" jobs – including engineers, architects, project managers and consultants - are expected to experience explosive growth at a rate of 1.3 million per year through 2030, creating the best opportunities for college graduates since the dot-com boom of the 1990's. The American Solar Energy Society reported that renewable energy and energy efficient industries created nearly 8.5 million jobs in 2006, expected to grow to 40 million by 2030, including support jobs such as accountants, truck drivers and computer analysts. However, most of the green economy jobs, according to Green for All, an organization that promotes green job training for the poor, will be weatherizing homes and offices, installing solar panels and retrofitting factories with energy-efficient technologies. "This is not an

¹ Shrinking the Carbon Footprint of Metropolitan America, The Brookings Institution

eco-elite, eco-chic movement for people who can afford to buy hybrid cars and shop at Whole Foods...The green economy to come is going to be a broad-shouldered, mass movement of American labor." Investing in renewable energy and energy conservation in Las Vegas will help diversify the economy and create opportunities for on the job training for skilled labor and for graduates of the University and Community College System of Nevada. Failure to act will place Las Vegas at a competitive disadvantage for jobs growth.

- **Cost of Energy.** World electricity generation is projected to double between 2006 and 2030, fossil fuels will account for 70 percent of the growth. The nation's electricity transmission facilities are estimated to require \$1.6 trillion in investment to keep pace with demand. Add to that a growing commitment among the nation's leaders to regulate carbon emissions, and upward pressure on electricity prices will remain strong as it has since 2000. During the period 2000 to 2008, average retail price per kilowatt hour of electricity for all sectors in Nevada has increased by just over 59 percent, compared to an increase of 32 percent nationally. By comparison, during the 1990s average retail price per kilowatt hour of electricity for all sectors in Nevada increased by 14 percent. During the 1990's Nevadan's paid on average 13 percent less for electricity than the national average, whereas since 2000 Nevadan's have paid 10 percent more than the national average. Investing in renewable energy and energy conservation in Las Vegas will protect the City from escalating electricity costs.
- **National Security.** America taxpayers have spent trillions of dollars, and more importantly thousands of American lives have been lost, securing oil interests in foreign countries. The largest transfer of wealth in history, \$700 billion annually and growing, is occurring now between the U.S. and unstable middle eastern countries whose interests are not aligned with ours. The U.S. imports 70% of its oil today, compared to 24% in 1970. American policy needs to move towards an energy independent future to create jobs and wealth in the U.S., save lives and money, and reduce green house gas emissions. Las Vegas, with its abundant solar resources, and demonstrated leadership with cleaner burning domestically produced and renewable alternative fuels, can provide leadership by reducing its reliance on foreign oil and non-renewable energy.

The Mayor and City Council have demonstrated a commitment to sustainability by adopting a body of public policy aimed at reducing the City's carbon footprint, supporting a strong economy and improving the quality of life for current and future generations of Las Vegans and those who come to visit. The City Manager has adopted a sustainability policy for the organization, in alignment with Council policy, that is changing professional practices and organizational culture. As a result, the City is reducing the cost of delivering public services while reducing the organization's carbon footprint.



The Sustainable Energy Strategy is one implementation measure of those policies. It is a comprehensive strategy that recommends investments in energy conservation and renewable energy based on a framework developed at the 2007 City Council – Planning Commission Workshop on Sustainability. The framework was approved by the City Council in a report presented during a subsequent public hearing. There are three components to the framework: city operations; city codes and policies; and community involvement.

In a recent study by the Brookings Institution, Las Vegas ranked 18th best among the 100 largest metropolitan areas for carbon emissions from transportation and energy use. This is a reflection of sound public policy. Las Vegas must continue to be progressive and invest in renewable energy and energy conservation to remain among the nations leading cities.

Energy Strategy Goals

City Operations

- By 2009, 100 percent of decisions on major capital projects and new City programs will be made after considering life cycle financial, environmental and social costs and benefits using the Sustainability Action Map.
- By 2011, invest in 3 megawatts of renewable energy, and 7 megawatts by 2015.
- Invest 100 percent of cost savings from renewable energy projects in energy conservation and additional renewable energy projects.
- By 2011, 10 percent reduction to the City's carbon footprint, 20 percent by 2020, and 30 percent by 2030.
- By 2011, reduce rate of electricity consumption per unit by 5 percent.

- By 2011, achieve 10 percent renewable energy portfolio standard, 20 percent by 2020, and 30 percent by 2030.
- By 2009, implement preferential purchasing policy for products that are certified to be environmentally friendly.
- By 2010, 90 percent of fuel consumed will be cleaner burning, domestically produced alternative fuel.
- By 2010, adopt contracting policy consistent with NRS that considers sustainable practices as criteria for awarding contracts.

City Codes, Regulations and Policies

- By 2010, adopt form-based sustainability zoning code.
- By 2011, adopt an energy code that is 30 percent more efficient than the current energy code.
- By 2009, work with Green Council to revise the Green Building Program to include mandates and incentives.

Community Involvement

- By 2009, participate in creating regional Home Performance energy audit and conservation program, and provide incentives to City residents who enroll in the program.
- By 2009, have fully implemented residential solar rebate program.
- By 2009, implement indoor water conservation program.

Triple Bottom Line Decision Making

*"We cannot solve our problems with the same thinking we used when we created them."
~Albert Einstein*

Investing in long-term strategies to conserve energy and increase energy from renewable resources requires a new approach to decision making. Financial accounting can no longer be the only bottom line. In order to successfully implement sustainability policies and reduce the city's carbon footprint, the "triple bottom line" must be considered. This approach, also known as "people, planet, profit" requires decision makers to take action based on a proposal's life-cycle impact on financial resources, natural resources and the environment, economic development, community livability and social health. For example, evaluating alternative investments in renewable energy technologies with equal energy generation and financial paybacks of 2, 5 and 10 years has to be measured against ongoing maintenance costs, potential impacts on air quality, reduction in greenhouse gas emissions and job creation throughout the life of the project.

Other less tangible measures such as community perception and leadership must also be taken into account when a community evaluates energy investment alternatives. As the world shifts to a clean or green economy, the economic scales will be tipped towards those cities marked by innovation and leadership; cities that make sustainability a priority and invest in renewable energy to secure their energy future. Those cities will attract skilled and educated workers and growing businesses looking to invest in, and associate

with, communities that are reducing their carbon footprint while creating a high quality of life.

Energy Trends

Investments in energy conservation and renewable energy projects are often evaluated based on a simple financial payback. A major factor in that calculation is the projected change in the cost of energy. For example, investing in a 1 kilowatt solar panel will cost approximately \$8,000. Assuming a 1 kilowatt solar panel generates 2,000 kilowatt hours of energy annually and energy costs \$0.10 per kilowatt hour, the value of energy delivered for a 1 kilowatt system is \$200 annually. It will take 40 years to payback the initial \$8,000 investment. To make the calculations simple and to isolate the effect of changing energy prices on payback calculations, other factors such as changes in system performance over time, maintenance costs, and the potential earnings from investing the \$8,000 dollars are ignored. Using this simple payback model, if the price of energy increases by 3% annually, the payback on the 1 kilowatt solar system is reduced from 40 years to just under 27 years. Energy prices in Nevada have increased by 59% in the last eight years.

Three trends leading to higher future energy costs are:

Global Demand

According to a report published by the Energy Information Administration (EIA) “International Energy Outlook 2008”, global demand for energy (including all forms of energy) is projected to grow by 50 percent by 2030. The report also projected energy costs to increase as much as 37 percent in constant dollars by 2030. This projection considers rising cost to build energy infrastructure, rising global demand for natural resources, rising temperatures, regulatory limitations on carbon emissions and development of power plants and transmission facilities.

Aging Energy Infrastructure

According to the American Society of Civil Engineers, aging and overburdened infrastructure threatens the economy and quality of life in every state, city and town in the nation. The U.S. power transmission system is in urgent need of modernization. Growth in electricity demand and investment in new power plants has not been matched by investment in new transmission facilities. Existing transmission facilities were not designed for the current level of demand, resulting in an increased number of "bottlenecks," which increase costs to consumers and elevate the risk of blackouts. To cure this problem, \$1.6 trillion investment is needed over a five-year period. This will increase the cost of power to households and businesses in Las Vegas. Investing in renewable energy at city facilities will lower demand on transmission facilities and save money for taxpayers.

Carbon Emissions Regulations

National policy is moving towards some form of regulation on carbon emissions. The two leading proposals are taxation and cap-and-trade. Either program will increase the cost of generating and delivering energy. In establishing a cap-and-trade program, policymakers would create a new commodity: the right to emit CO₂. The Congressional Budget Office estimated that by 2020, the value of CO₂ allowances could total between \$50 billion and \$300 billion annually (in 2006 dollars). Investing in renewable energy will reduce the risk to the City of paying for carbon emissions, and create a commodity that can be sold to further offset the initial investment.

Climate Change

Nevada Climate Change Advisory Committee

The Governor's Climate Change Advisory Committee provided a general overview of potential impacts to the state of Nevada from a change in the climate. Data was provided that indicated forecasted climate changes would have an undesirable impact on public health, the environment, and the economy in the Silver State:

- High temperatures could result in direct public health concerns with heat sickness, increased troposphere ozone pollution and increased dust and particulate matter concentrations.
- Increased drought conditions in the southern part of the state.
- Less snowfall but more precipitation (Sierras) increasing flooding.
- Decreasing water reserves.
- More forest and wild land fires with potential greater intensity and devastating consequences.
- Disappearance of some native species of fauna and increased invasive weed species.
- Agriculture practices and recreation opportunities in Nevada could also be negatively impacted.

Intergovernmental Panel on Climate Change (IPCC)

The IPCC was set up by the World Meteorological Organization and by the United Nations Environment Program. Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts and options for adaptation and mitigation.

At continental, regional and ocean basin scales, numerous long-term changes in climate have been observed:

- Changes in arctic temperatures and ice,
- Widespread changes in precipitation amounts, ocean salinity, wind patterns, and
- Aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones.

Comparative Analysis: Cities Respond to Climate Change

In response to threats from climate change, many leading cities around the country have adopted policies to reduce their greenhouse gas emissions.

- Seattle, WA – reduce GHG emissions 7 percent below 1990 levels by 2012.
- Portland, OR - reduce CO₂ emissions to 10 percent below 1990 levels by 2010.
- San Francisco, CA - reduce GHG emissions by 20 percent below 1990 levels by 2012.
- New York City, NY - 30 percent reduction in emissions made by city operations by 2017 and a 30 percent reduction in emissions citywide by 2030.
- Denver, CO - by 2012 reduce its emissions of greenhouse gases by 10 percent per capita relative to 1990 levels.
- Phoenix, AZ - a statewide goal to reduce Arizona's greenhouse gas emissions to the 2000 emissions level by the year 2020, and to 50 percent below the 2000 level by 2040.

Southern Nevada Regional Planning Coalition
Regional Plant List



Approved
June 28, 2011



Acknowledgements

This Regional Plant List has been the effort of literally countless hours of work from members of the Southern Nevada Regional Planning Coalition's (SNRPC) Regional Urban Forestry Work Group and local arboriculture and horticulture experts. Special thanks go to the following individuals for their contributions:

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On the cover: Acacia Demonstration Gardens, 50 Casa Del Fuego St., Henderson, NV

Table of Contents

Introduction	ii
How to Use the List	ii
Process for Review and Amendment.....	ii
Trees	1
Shrubs	3
Groundcovers.....	5
Vines.....	6
Agaves, Cacti, Succulents, and Yuccas	6
Ornamental Grasses.....	8
Perennials	8
Plants with Special Needs	10
References.....	10

Introduction

The Southern Nevada Regional Planning Coalition (SNRPC) is pleased to present this list of plants that can be adapted to our desert environment in the Las Vegas area for use in new developments and in retrofits to existing developments. It was created by members of the SNRPC's Regional Urban Forestry Working Group in conjunction with local experts including arborists, horticulturists, and urban foresters. Much of the work that went into the creation of this list was built on the foundations of excellent local resources such as the Nevada Division of Forestry's 2007 *Cleaner Air, Tree by Tree* and the 2005 Centennial edition of *Trees for Tomorrow*, a project of the High Desert Resource Conservation & Development Council. Both projects were made possible by grants from the Nevada Division of Forestry and the United States Forest Service.

The intent of this list is to provide a single, region-wide reference for landscape designers, architects and developers to select appropriate plants when designing their projects in the Las Vegas area. In addition, it is a tool for those who review those projects—such as city planners—to determine if those plants meet applicable codes and ordinances. In short—right plant, right place.

This list is not intended to be a list of the only plants allowed in the region, nor is it intended to be an exhaustive, comprehensive list of all desert-appropriate plants. In addition, it is not intended to restrict what plants residents choose to plant in their yards. Rather, we hope that this list will help residents and developers make informed decisions about which plants to choose.

How to Use the List

The list is divided between trees and other plants, including shrubs, groundcovers, vines, succulents and perennials. It is sorted alphabetically by botanical name and includes the common names of the plants. There are several columns of attributes that can be used to determine which plants are appropriate to use in specific situations.

For example, an out-of-state landscape architect is looking to select a Mojave native shrub that can act as a screen or hedge, but is thornless and is highly drought tolerant. A quick look down the attributes reveal a couple of recommendations in *Asclepias subulata* “desert milkweed” and *Foresteria pubescens (neomexicana)* “desert olive,” a.k.a. “New Mexico privet.”

In another example, a city planner is reviewing a development application that shows an *Arbutus unedo* “strawberry tree” proposed as a tree in a parking lot diamond. A quick review of the tree list reveals that this small tree is not appropriate as a parking lot tree, and the planner is able to recommend several other species that will serve that purpose.

Process for Review and Amendment

The SNRPC Plant List is intended to be a living document and will therefore be open to periodic review and amendment. To that end, the SNRPC Planning Directors shall review the list on an annual basis with input from local plant experts as needed. Any requests to add or delete plants from the list must be submitted to the SNRPC secretary in writing. The request shall include the following information at a minimum: the applicant's name and contact information, the botanical and common name(s) of the plant(s) to be considered, reasons for the plant(s) to be considered, and any supporting documentation. For new plants, supporting documentation shall include the plants' attributes as well as information regarding the plants' history and performance in similar climates. Supporting documentation must be verified by a certified arborist or horticulturist.

1

2

KEY		"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS		
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established. Height, Width, Coverage at mature growth. Type: Deciduous, Evergreen, Semi-evergreen Growth Rate: Slow, Medium, Fast Water Use: Very Low, Low, Medium, High Drought Tolerance: Low, Medium, High Exposure: Full sun, Partial shade, Shade																
BOTANICAL NAME		COMMON NAME		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
SHRUBS																
Abelia x grandiflora		Glossy Abelia			5	5	20	E, S	F	M	M	N	Y	Y	F, P	
Abutilon palmeri		Velvet-leaf Mallow, Superstition Mallow			4	4	13	E, S	M	L, M	M	N	N	N	F, P	
Acacia berlandieri		Berlandier Acacia, Guajillo			12	12	113	D	M	L, M	H	N	N	N	F, P	
Acacia craspedocarpa		Leatherleaf Acacia, Waxleaf A.			10	15	177	E	S	L	M	N	N	N	Y	F
Acacia cultiformis		Knifeleaf Acacia, Knife Acacia			10	10	79	E	M	L	M	N	N	Y	F, P	4
Acacia redolens		Creeping Acacia, Prostrate Acacia		●	3	10	79	E	F	VL	H	N	N	N	F	
Acacia rigidula		Blackbrush Acacia			10	10	79	S	S	L	H	Y	Y	N	P	
Alyogne huegelii		Blue Hibiscus			6	6	28	E	M	L	M	N	N	N	F	
Ambrosia dumosa		White Bursage, Burrobush		●	2	4	13	E	F	L	H	N	N	N	F	6
Ambrosia eriocentra		Wooly Bursage		●	3	3	7	E	M	L	H	N	N	N	F,P	6
Anisacanthus quadrifidus-wrightii 'Mexican Flame'		Mexican Flame			4	4	13	D	M	L	H	N	N	Y	F, P	
Anisodonteia hypomandarum		Pink Desert Hibiscus, African Mallow			4	4	13	E	F	M	L	N	Y	Y	F, P	
Artemisia filifolia		Sand Sage		●	4	3	7	E	M	L	H	N	N	Y	F	6
Artemisia tridentata		Big Sage Brush		●	4	3	7	E	M	L	H	N	N	Y	F	6
Asclepias subulata		Desert Milkweed		●	5	5	20	E	S	L	H	N	Y	Y	F	6
Atriplex canescens		Four-Wing Saltbush		●	5	8	50	S	M	M	H	N	N	N	P	6
Atriplex confertifolia		Shadscale		●	2	3	7	D	F	VL	H	Y	N	N	F	6
Atriplex hymenelytra		Saltbush, Desert Holly		●	2	2	3	E	S	VL	H	N	N	N	F	6
Atriplex lentiformis		Quailbush, Big Saltbush		●	6	8	50	D	M	L	H	Y	Y	Y	F	6
A. l. breweri		Brewer's Saltbush, Quail Bush		●	7	7	38	E	M	L	H	Y	Y	Y	F	6
Atriplex polycarpa		Desert Saltbush		●	6	6	28	D	S	M	H	N	N	N	F	6
Baccharis sarothroides		Desert Broom, Coyote Bush			6	7	38	E	M	L	H	N	Y	N	F	3, 5, 6
Baccharis x 'Centennial' (female hybrid)		Centennial Broom			3	5	20	E	F	L	H	N	N	N	F	
Baccharis x 'Starn' (male hybrid)		Thompson Broom			3	5	20	E	M	L	H	N	N	N	F	
Bebbia juncea		Sweet Bush		●	3	3	7	S	M	L	H	N	N	N	F	6
Berberis fremontii		Fremont's Barberry		●	6	4	13	E	S	L	H	Y	Y	Y	F,P	6
Berberis thunbergii		Japanese Barberry			4	4	13	D	M	M	L	Y	Y	Y	F, P	2
Buddleja davidii		Butterfly Bush			8	6	28	D,S	F	L, M	L	N	Y	Y	F, P	
Buddleja marrubifolia		Wooly Butterfly Bush		●	5	5	20	E	F	L	H	N	Y	Y	F, P	
Buddleja utahensis		Utah Butterfly Bush		●	2	2	3	E	M	L	H	N	N	N	F,P	6
Buxus microphylla 'Japonica'		Japanese Boxwood			4	4	13	E	S	L	M	N	N	Y	F, P, S	1
Caesalpinia gilliesii		Yellow Bird of Paradise			8	6	28	D, E	F	L	H	N	N	N	F	2, 7 (seed pods)
Caesalpinia mexicana		Mexican Bird of Paradise		●	12	6	28	D, E	F	L	H	N	N	N	F, P	2, 7 (seed pods)
Caesalpinia pulcherrima		Red Bird of Paradise			6	6	28	D, E	F	L	H	Y	N	N	F	2, 7 (seed pods)
Calliandra californica		Baja Fairy Duster		●	5	6	28	E	S,M	L	H	N	N	N	F, P	
Calliandra eriophylla		Pink Fairy Duster		●	3	3	7	E	S,M	L	H	N	N	N	F, P	
Callistemon citrinus		Bottlebrush, Lemon Bottlebrush			8	8	50	E	M	M	M	N	Y	N	F	1, 8
C. c. 'Nana'		Dwarf Bottlebrush			2	3	7	E	S	M	M	N	N	N	F	1
Caryopteris x clandonensis 'Dark Knight'		Blue Mist Spirea			3	4	13	D	M	M	L	N	Y	N	F, P	
Chamaebatiaria millefolium		Fern Bush, Desert Sweet			5	5	20	S	M	L	M	N	Y	N	F, P	
Chrysactinia mexicana		Damianta		●	2	2	3	E	S,M	L	M	N	N	N	F	
Chrysothamnus viscidiflorus		Yellow Rabbit Brush, Green Rabbit Brush		●	3	3	7	D	M	L	H	N	N	N	F	
Cistus hybridus		White Rockrose			3	5	20	E	F	L	H	N	N	N	F	
Cistus purpureus		Purple Rock Rose, Orchid Rockrose			4	4	13	E	F	L	H	N	N	N	F	
Coleogyne ramosissima		Blackbrush		●	5	5	20	S	S	L	H	N	Y	Y	F	
Cordia parvifolia		Little Leaf Cordia		●	6	8	50	E	M	M	H	N	Y	Y	F	
Cotoneaster congestus		Pyrenees Cotoneaster			2	3	7	E	M	L, M	M	N	N	Y	F, P	
Cotoneaster glaucophyllus		Gray-Leaf Cotoneaster			5	6	28	E	M	M	M	N	Y	Y	F, P	
Cotoneaster lacteus		Red Clusterberry			6	6	28	E	M	L, M	M	N	Y	Y	F, P	
Cotoneaster microphyllus		Rockspray			3	6	28	E	M	L, M	M	N	N	N	F, P	
Cycas revoluta		Japanese Sago Palm			5	6	28	E	S	L, M	M	Y	Y	N	P, S	
Dalea bicolor 'argyraea'		Silver Dalea		●	3	3	7	E	F	L	H	N	N	N	F	
Dalea frutescens		Black Dalea		●	4	5	20	S	M	L	H	N	Y	Y	F	
Dalea pulchra		Pink Indigo Bush		●	4	5	20	E	M,F	L	H	N	Y	Y	F	
Dodonaea viscosa		Purple Hopseed Bush			10	6	28	E	M	L, M	M	N	Y	Y	F	
Duranta erecta 'Sweet Memory'		Golden Dewdrop, Sky Flower			15	10	79	S	S	M	L, M	N	N	Y	F, P	7 (berries), 8
Elaeagnus pungens		Silverberry			8	8	50	E	F	L, M	M	Y	Y	Y	F, P	
Elaeagnus x ebbingei		Ebbing's Silverberry			8	8	50	E	F	L, M	M	N	Y	Y	F, P	
Encelia farinosa		Brittlebush		●	3	4	13	D	M	VL	H	N	N	N	F	6
Encelia virginensis		Virgin River Brittlebush		●	2	2	3	S	M	VL	H	N	N	N	F	6
Ephedra nevadensis		Nevada Jointfir, Nevada Mormon Tea		●	3	3	7	E	M	VL	H	N	N	N	F	6
Ephedra viridis		Mormon Tea		●	3	3	7	E	S	L	H	N	N	N	F	6
Eremophila decipiens		Slender Fuchsia			3	3	7	E	M	L	H	N	Y	Y	F,P	
Eremophila laanii 'Pink Beauty'		Pink Beauty Emu Bush			6	6	28	E	F	M	H	N	Y	Y	F	
Eremophila glabra 'Murchinson River'		Fire and Ice Emu Bush			3	6	28	E	M	L	H	N	Y	Y	F	
Eremophila maculata		Spotted Emu Bush			6	6	28	E	S	L	H	N	Y	Y	F,P	

KEY															COMMENTS
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established. Height, Width, Coverage at mature growth. Type: Deciduous, Evergreen, Semi-evergreen Growth Rate: Slow, Medium, Fast Water Use: Very Low, Low, Medium, High Drought Tolerance: Low, Medium, High Exposure: Full sun, Partial shade, Shade		Comments: 1. Organic mulch recommended. 2. Many cultivars. 3. Some species may form dense thickets. 4. Not cold hardy below 28°F. 5. Invasive species. 6. Mojave native. 7. Toxic (parts specified). 8. May be trained as a small tree. 9. Needs a protected site (north facing site or afternoon shade).													
BOTANICAL NAME	COMMON NAME	"Bulletproof"	Height (average) (feet)	Width (average) (feet)	Coverage (sq. feet)	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure		
			(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
SHRUBS (continued)															
E. m. 'Valentine'	Valentine Emu Bush		4	5	20	E	M	L	H	N	Y	Y	F		
E. m. 'Winter Gold'	Winter Gold Emu Bush		4	6	28	E	M	L	H	N	Y	Y	F,P		
Eremophila racemosa	Easter Egg Eremophila		5	5	20	E	M	L	H	N	Y	Y	F		
Eremophila x 'Summertime Blue' (polyclada x divaricata)	Summertime Blue Emu Bush		6	10	79	E	F	L	H	N	Y	Y	F		
Eremophila sp.	Eremophila, Emu Bush	•	4	4	13	E	M	L	H	N	Y	Y	F,P		
Ericameria cuneata	Cliff Goldenbush	•	2	3	7	D	S	L	H	N	N	N	F	6	
Ericameria laricifolia	Turpentine Bush	•	2	3	7	D	S	VL	H	N	N	N	F		
Eriodictyon angustifolium	Yerba Santa	•	3	3	7	E	M	L	H	N	N	N	F,P	6	
Eriogonum corymbosum var. nilesii	Las Vegas Valley Buckwheat	•	3	3	7	D	M	VL	H	N	N	N	F	6	
Eriogonum fasciculatum	Wild Buckwheat, California Buckwheat	•	2	3	7	E	F	L	H	N	N	N	F	6	
Eriogonum sp.	Buckwheat	•	3	3	7	D	M	L	H	N	N	N	F		
Euonymus japonica	Evergreen Euonymus		6	6	28	E	S	M	M	N	Y	Y	P, S	1	
E. j. 'Aureo-Variegata'	Gold Spot Euonymus		5	6	28	E	S,M	M	M	N	Y	Y	P, S	1	
E. j. 'Microphylla'	Box-leaf Euonymus		2	2	3	E	S	M	M	N	N	Y	P, S	1	
E. j. 'Silver King'	Silver King Euonymus		5	6	28	E	S	M	M	N	N	Y	P, S	1	
Fallugia paradoxa	Apache Plume	•	6	4	13	S	F	L	H	N	Y	Y	F,P	6	
Feijoa sellowiana	Pineapple Guava		15	15	177	E	S	L	H	N	Y	Y	F,P	1, 8	
Forestiera pubescens (=neomexicana)	Desert Olive, New Mexico Privet	•	6	6	28	D	M	L	H	N	Y	Y	F,P	6	
Fraxinus greggii	Little Leaf Ash	•	8	8	50	E	S	M	M	N	Y	Y	F,P	8	
Genista tinctoria	Dyer's Greenwood		6	6	28	D	S	L	H	N	N	N	F		
Gutierrezia sarothrae	Snakeweed	•	2	2	3	S	M	VL	H	N	N	N	F,P	6	
Juniperus chinensis 'Blue Point'	Blue Point Juniper		10	4	13	E	M	M	M	N	Y	Y	F,P		
J. c. 'Spartan'	Spartan Chinese Juniper		15	6	28	E	M	L	H	N	Y	Y	F,P		
J. c. 'Sea Green'	Sea Green Juniper		5	6	28	E	M	M	M	N	Y	Y	F,P		
J. c. 'Torulosa'	Hollywood Twisted Juniper		15	10	79	E	M	L	H	N	Y	Y	F,P	8	
Juniperus sabina 'Tamariscifolia'	Tam Juniper		3	10	79	E	M	M	L	N	N	N	P	1	
Juniperus scopulorum 'Gray Gleam'	Gray Gleam Juniper		15	6	28	E	S	M	M	N	Y	Y	F, P	8	
Juniperus sp.	Juniper		20	10	79	E	M	L, M	M	N	var.	var.	F, P	2	
Justicia californica	California Justicia, Chuparosa	•	3	4	13	D	M	L	H	N	N	N	F		
Justicia candicans	Red Justicia	•	5	3	7	D	M	H	L	N	N	N	P,S		
Justicia spicigera	Mexican Honeysuckle	•	3	4	13	E	M	M	M	N	N	N	F,P	2	
Keckelia antirrhinoides	Yellow Snapdragon Bush	•	4	4	13	S	M	L	H	N	N	Y	F,P	6	
Krascheninnikovia lanata	Winterfat	•	2	3	7	E	F	VL	H	N	N	N	F	6	
Lantana camara	Bush Lantana		3	6	28	E	F	L	H	N	N	N	F	2,7(berries, leaves)	
Larrea tridentata	Creosote Bush	•	8	6	28	E	M	VL	H	N	N	Y	F	6	
Leucophyllum candidum 'Silver Cloud'	Silver Cloud Texas Ranger	•	5	5	20	E	S	L	H	N	Y	Y	F		
L. c. 'Thunder Cloud'	Thunder Cloud Texas Ranger	•	3	4	13	E	S	L	H	N	Y	Y	F		
Leucophyllum frutescens	Texas Ranger, Texas Sage, Cenizo	•	6	6	28	E	S	L	H	N	Y	Y	F		
L. f. 'Compacta'	Compact Texas Ranger	•	5	5	20	E	S	L	H	N	Y	Y	F		
L. f. 'Green Cloud'	Green Cloud Texas Ranger	•	6	6	28	E	S	L	H	N	Y	Y	F		
L. f. 'White Cloud'	White Cloud Texas Ranger	•	6	6	28	E	S	L	H	N	Y	Y	F		
Leucophyllum langmaniae 'Lynn's Legacy'	Lynn's Legacy Texas Ranger	•	5	5	20	E	S	L	H	N	Y	Y	F		
L. l. 'Rio Bravo'	Rio Bravo Texas Ranger	•	6	6	28	E	S	L	H	N	Y	Y	F		
Leucophyllum laevigatum	Chihuahuan Sage	•	6	6	28	E	S	L	H	N	Y	Y	F		
Leucophyllum pruinosum 'Sierra Bouquet'	Sierra Bouquet Texas Ranger	•	6	6	28	E	S	L	H	N	Y	Y	F		
Leucophyllum revolutum 'Houdini'	Houdini Texas Ranger		4	4	13	E	S	L	H	N	Y	Y	F		
Leucophyllum zygophyllum 'Cimarron'	Blue Texas Ranger, Cimarron Ranger	•	3	3	7	E	S	L	H	N	Y	Y	F		
Leucophyllum x 'Rain Cloud'	Rain Cloud Texas Ranger	•	5	4	13	E	S	L	H	N	Y	Y	F		
Lycium andersonii	Wolf Berry	•	6	4	13	D	M	VL	H	Y	N	Y	F	6	
Lycium cooperi	Cooper's Wolfberry	•	5	6	28	E	F	L	H	Y	Y	Y	F,P	6	
Lycium pallidum var. oligospermum	Pale Wolfberry	•	5	6	28	E	F	L	H	Y	Y	Y	F,P	6	
Malpighia glabra 'Mariquita'	Barbados Cherry		3	3	7	S	M	L, M	L	N	N	N	P	1, 4	
Myrtus communis	Classic Myrtle		6	6	28	E	S	L	H	N	Y	Y	F,P	1	
M. c. boetica	Twisted Myrtle		10	10	79	E	S	L	H	N	N	Y	F,P	1, 8	
M. c. 'Compacta'	Compact Myrtle		4	4	13	E	S	L	H	N	N	Y	F,P	1	
Nerium oleander	Oleander	•	15	15	177	E	M	L	H	N	Y	Y	F	** 2, 7(all parts), 8	
N. o. 'Petite'	Dwarf Oleander	•	6	5	20	E	M	L	H	N	Y	Y	F	** 2, 7(all parts)	
Phlomis fruticosa	Shrubby Jerusalem Sage		3	3	7	E	M	L, M	M	N	N	N	F, P	1	
Phlomis lanata	Jerusalem Sage		3	4	13	E	M	L, M	M	N	N	N	F, P	1	
Plumbago auriculata	Cape Plumbago		6	8	50	E, S	M,F	L, M	M	N	N	N	F, P		
Poliomnitha maderensis	Lavender Spice, Mexican Oregano		3	3	7	E, S	M	L, M	M	N	N	N	F, P		
Prunus fasciculata	Desert Almond	•	4	4	13	D	M	L	H	N	N	N	F	6	
Psoralemmus fremontii	Indigo Bush	•	3	4	13	D	S	VL	H	N	N	N	F	6	
Psoralemmus polydenius	Nevada Smokebush	•	5	4	13	D	S	VL	H	N	N	N	F	6	
**NOT ACCEPTED IN THE CITY OF HENDERSON															

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KEY																	
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established. Height, Width, Coverage at mature growth. Type: Deciduous, Evergreen, Semi-evergreen Growth Rate: Slow, Medium, Fast Water Use: Very Low, Low, Medium, High Drought Tolerance: Low, Medium, High Exposure: Full sun, Partial shade, Shade		Comments:															
		1. Organic mulch recommended.															
		2. Many cultivars.															
		3. Some species may form dense thickets.															
		4. Not cold hardy below 28°F.															
		5. Invasive species.															
		6. Mojave native.															
		7. Toxic (parts specified).															
		8. May be trained as a small tree.															
		9. Needs a protected site (north facing site or afternoon shade).															
		BOTANICAL NAME		COMMON NAME			"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen
					(feet)	(feet)	(sq. feet)		D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S	
SHRUBS (continued)																	
<i>Punica granatum</i> 'Nana'	Dwarf Pomegranate	•	3	3	7	D	M	M	M	Y	N	N	F, P				
<i>Purshia mexicana</i>	Mexican Cliffrose	•	7	4	13	E	S	L	M	N	N	N	F				6
<i>Purshia stansburiana</i> (=Cowania)	Cliff Rose	•	6	6	28	E	S	L	H	N	N	Y	F, P				6
<i>Pyracantha</i> sp.	Pyracantha, Firethorn		8	8	50	E	F	M	M	Y	Y	Y	F, P				1
<i>Quercus turbinella</i>	Scrub Live Oak	•	6	6	28	E	S	L	H	Y	Y	Y	F, P, S				6
<i>Rhus microphylla</i>	Littleleaf Sumac	•	8	12	113	D	M	L	H	Y	Y	Y	F, P				
<i>Rhus ovata</i>	Sugar Bush	•	12	12	113	E	S, M	L, M	H	N	Y	Y	F, P				
<i>Rhus trilobata</i>	Squaw Bush / Skunk Bush	•	5	8	50	D	M	L	H	N	Y	Y	F, P				
<i>Rhus virens</i>	Evergreen Sumac	•	10	15	177	E	M	L	H	N	Y	Y	F, P				8
<i>Romneya coulteri</i>	Matilija Poppy, Fried Egg Poppy		6	6	28	S	S	L, M	M	N	N	N	F, P				
<i>Rosa</i> sp.	Rose		4	3	7	D, E	F	M	M	Y	Y	Y	F, P				1, 2
<i>Rosa woodsii</i>	Woods' Rose		4	4	13	D	M	M	M	Y	Y	N	F, P				3, 6
<i>Rosmarinus officinalis</i>	Rosemary		4	6	28	E	M, F	L, M	M	N	Y	Y	F, P				
<i>Ruellia peninsularis</i>	Desert Ruellia	•	4	5	20	S	M	L	H	N	N	Y	F				
<i>Russelia equisetiformis</i>	Coral Fountain		4	6	28	E, S	M	M	H	N	N	N	F, P				4
<i>Salazaria mexicana</i>	Bladdersage	•	3	3	7	D	M	VL	H	N	N	N	F				6
<i>Salvia chamaedryoides</i>	Mexican Blue Sage	•	2	2	3	E, S	M	M	M	N	N	N	F, P				
<i>Salvia clevelandii</i>	Chaparral Sage	•	5	6	28	E	M	L	H	N	Y	N	F, P				
<i>Salvia coccinea</i>	Scarlet Sage		3	4	13	S	M	L, M	M	N	N	N	F, P				
<i>Salvia dorrì</i>	Purple Sage, Desert Sage	•	2	3	7	E, S	M	L	H	N	N	N	F, P				6
<i>Salvia greggii</i>	Autumn Sage		2	2	3	S	F	L, M	M	N	N	N	F, P				2
<i>Salvia leucantha</i>	Mexican Bush Sage		4	4	13	S	M, F	M	M	N	N	N	F, P				1
<i>Salvia microphylla</i> 'Sierra Madre'	Sierra Madre Sage		3	3	7	E	M	M	M	N	N	N	F, P				
<i>Salvia mohavensis</i>	Mojave Sage	•	3	3	7	E	M	VL	H	N	N	N	F, P, S				6
<i>Salvia</i> sp.	Sage		4	4	13	D, E	M, F	M	M	N	N	N	F, P				
<i>Sambucus mexicana</i>	Mexican Elderberry	•	15	15	177	D, S	M, F	L, M	H	N	Y	Y	F, P				6, 8
<i>Santolina chamaecyparissus</i>	Lavender Cotton, Gray Santolina		2	3	7	E	M	L, M	M	N	N	N	F, P				
<i>Santolina rosmarinifolia</i> (=S. virens)	Green Lavender Cotton, Green Santolina		2	3	7	E	M	L, M	M	N	N	N	F, P				
<i>Senna armata</i> (=Cassia)	Spiny Senna	•	3	4	13	D	M	VL	H	Y	N	N	F				6
<i>Senna artemisioides</i> (=Cassia)	Feathery Senna, Feathery Cassia	•	6	6	28	E	M	VL, L	H	N	N	Y	F, P				
<i>Senna lindheimeriana</i> (=Cassia)	Velvet-leaf Senna	•	3	3	7	E	M	L	H	N	N	N	F, P				
<i>Senna nemophila</i> (=Cassia)	Desert Senna, Desert Cassia		6	6	28	E	M	L	H	N	N	N	F, P				4
<i>Senna phyllodinea</i> (=Cassia)	Silvery Senna, Silver Leaf Cassia		6	6	28	E	M	L	H	N	N	N	F, P				4
<i>Senna wislizenii</i> (=Cassia)	Shrubby Senna, Shrubby Cassia		8	6	28	D	M	L	H	N	N	N	F, P				
<i>Simmondsia chinensis</i>	Jojoba	•	6	6	28	E	S, M	VL, L	H	N	Y	Y	F, P				
<i>S. c.</i> 'Vista'	Compact Jojoba	•	4	4	13	E	S, M	VL, L	H	N	Y	Y	F, P				
<i>Sophora arizonica</i>	Arizona Mescal Bean	•	10	8	50	E	S	L, M	M	N	N	N	F, P				8
<i>Tecoma stans</i>	Yellow Trumpet Flower, Yellow Bells		8	8	50	S	F	L, M	M	N	N	N	F, P				2, 8
<i>Tecoma</i> x 'Orange Jubilee'	'Orange Jubilee' Tecoma, Orange Bells		8	8	50	D, S	F	L, M	M	N	N	N	F, P				
<i>Tecoma</i> x 'Sunrise' TM	'Sunrise' Tecoma		8	8	50	D, S	F	L, M	M	N	N	N	F, P				
<i>Teucrium chamaedrys</i>	Germander		2	2	3	E	M	L, M	M	N	N	N	F, P				
<i>Thamnosma montana</i>	Turpentine Broom	•	2	2	3	D	S	VL	H	N	N	N	F				6
<i>Vauquelinia californica</i>	Arizona Rosewood	•	15	10	79	E	M	L	H	N	Y	Y	F, P				8
<i>Vauquelinia corymbosa</i> var. <i>heterodon</i>	Narrowleaf Rosewood	•	15	15	177	E	M	L, M	H	N	Y	Y	F, P				8
<i>Wedelia texana</i> 'Devil's River' (= <i>Zexmenia hispida</i>)	Devil's River, Orange Daisy		3	3	7	S, D	M	L, M	H	N	N	N	F, P				
<i>Xylosma congestum</i>	Xylosma	•	8	8	50	E	M	M	M	N	N	Y	F, P, S				
<i>X. c.</i> 'Compacta'	Dwarf Xylosma	•	5	6	28	E	M	M	M	N	N	Y	F, P, S				
<i>Ziziphus obtusifolia</i>	Greythorn	•	6	8	50	D	S, M	L	H	Y	Y	Y	F, P				6
GROUNDCOVERS																	
<i>Abronia villosa</i>	Desert Sand Verbena	•	1	2	3	D	M	L	H	N	N	N	F				6
<i>Acacia redolens</i> 'Desert Carpet'	Desert Carpet Creeping Acacia	•	2	12	113	E	S, M	VL	H	N	N	N	F				
<i>Acalypha monostachys</i>	Raspberry Fuzzies		1	1	1	S	M	M	M	N	N	N	F				
<i>Aptenia cordifolia</i>	Hearts and Flowers, Red Apple Ice Plant		1	3	7	E	M	L, M	L, M	N	N	N	F, P				
<i>Asteriscus maritimus</i>	Gold Coin Daisy		1	3	7	E	M	L, M	M	N	N	N	F				
<i>Baccharis pilularis</i> 'Pigeon Point'	Dwarf Coyote Brush	•	1	8	50	E	F	L	L	N	N	N	F				
<i>Berberis repens</i> (=Mahonia)	Creeping Oregon Grape		2	4	13	E	S	M	M	N	N	N	P, S				1
<i>Calylophus hartwegii</i>	Sierra Sundrop		1	2	3	D	F	L	H	N	N	N	F				
<i>Cephalophyllum speciosum</i> 'Red Spike'	Red Spike Iceplant		1	2	3	E	M	L	M	N	N	N	F, P				4
<i>Cerastium tomentosum</i>	Snow-in-Summer		1	1	1	D	F	L	L	N	N	N	F, P				
<i>Conoclinium greggii</i> 'Boothill' (=Eupatorium)	Boothill Eupatorium		2	2	3	E	F	M	M	N	N	N	P				
<i>Convolvulus cneorum</i>	Bush Morning Glory		2	4	13	E	F	L	M	N	N	N	F				
<i>Convolvulus mauritanicus</i>	Ground Morning Glory		1	3	7	P	F	L	M	N	N	N	F				
<i>Cotoneaster horizontalis</i>	Rock Cotoneaster		2	6	28	E	M	M	L	N	N	N	P				
<i>Dalea capitata</i> 'Sierra Gold'	Sierra Gold Dalea	•	1	3	7	D	F	L	H	N	N	N	F				1
<i>Dalea greggii</i>	Prostrate Indigo Bush	•	1	8	50	E	F	L	H	N	N	N	F				

KEY		"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS	
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established. Height, Width, Coverage at mature growth. Type: Deciduous, Evergreen, Semi-evergreen Growth Rate: Slow, Medium, Fast Water Use: Very Low, Low, Medium, High Drought Tolerance: Low, Medium, High Exposure: Full sun, Partial shade, Shade															
BOTANICAL NAME		COMMON NAME		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S	
GROUNDCOVERS (continued)															
Dichondra argentea 'Silver Falls'	Silver Dichondra, Kidneyweed		1	3	7	S	F	L	M	N	N	N	F, P		
Dichondra micrantha	Green Dichondra		1	3	7	E	M	M	L	N	N	N	P, S	1	
Drosanthemum cooperi	Purple Iceplant		1	4	13	E	M, F	L	M	N	N	N	F, P		
Euonymus fortunei 'Coloratus'	Purple-leaf Wintercreeper		1	3	7	E	M	M	L	N	N	N	P	1	
Euphorbia rigida	Spurge, Gopher Plant	●	2	3	7	E	F	L	H	N	N	N	F		
Gazania rigens	Gazania, Treasure Flower		1	1	1	E	F	L	M	N	N	N	F, P	2	
Glandularia gooddingii (=Verbena)	Goodding Verbena	●	1	3	7	D	M	L	H	N	N	N	F	6	
Glandularia peruviana (=Verbena)	Peruvian Verbena		1	2	3	D	F	L	L	N	N	N	P		
Glandularia pulchella (= Verbena)	Moss Verbena		1	3	7	E	M	L, M	L	N	N	N	F, P		
Glandularia tenera (=Verbena)	Rock Verbena		1	2	3	P	F	L	L	N	N	N	P		
Juniperus chinensis procumbens	Japanese Garden Juniper		2	8	50	E	S	M	L	N	N	N	P	1	
Juniperus conferta	Shore Juniper		1	8	50	E	S	M	L	N	N	N	P	1	
Juniperus horizontalis 'Prince of Wales'	Prince of Wales Juniper		1	4	13	E	S	M	L	N	N	N	P	1	
J. h. 'Wiltonii'	Blue Carpet Juniper		1	6	28	E	S	M	L	N	N	N	P	1	
Juniperus sabina 'Buffalo'	Buffalo Juniper		1	8	50	E	S	M	L	N	N	N	P	1	
Lantana montevidensis	Trailing Lantana		1	6	28	D	F	L	M	N	N	N	F	7 (berries, leaves)	
Malephora crocea	Gray Ice Plant, Coppery Mesemb		1	3	7	E	M	L, M	M	N	N	N	F, P		
Malephora lutea	Rocky Point Ice Plant		1	3	7	E	M	L, M	M	N	N	N	F, P		
Mirabilis multiflora	Four O'Clock	●	2	2	3	D	F	L	H	N	N	N	F, P, S	6	
Muehlenbeckia axillaris	Creeping Wire Vine		1	3	7	E	F	M	M	N	N	N	P		
Myoporum brevifolium 'Emerald Gem'	Small Leaf Myoporum		0.5	4	13	D	M	L, M	H	N	N	N	F, P		
Myoporum parvifolium	Prostrate Myoporum		0.5	8	50	D	F	L	H	N	N	N	F		
Pyracantha fortuneana 'Santa Cruz'	Santa Cruz Pyracantha, Firethorn		2	5	20	E	M	M	M	Y	Y	Y	P	1	
Rosmarinus officinalis 'prostratus'	Prostrate Rosemary		2	4	13	E	F	L	H	N	N	Y	F		
Sedum spectabile	Stonecrop		1	2	3	E	F	L	M	N	N	N	P		
Sphaeralcea grossulariifolia	Goosefoot Mallow	●	2	4	13	E	F	VL	H	N	N	N	P	6	
Stachys coccinea	Texas Betony, Scarlet Hedge Nettle		1	2	3	E, S	M	M	M	N	N	N	F, P		
Tradescantia pallida 'Purpurea'	Purple Heart, Wandering Jew		1	2	3	E	M	L, M	L	N	N	N	F, P	1	
Verbena rigida	Sandpaper Verbena, Coarse Verbena		1	3	7	P	F	L	L	N	N	N	F		
Vinca minor	Dwarf Periwinkle		2	2	3	E	S, M	M, H	L	N	N	N	P, S	1	
VINES															
Antigonon leptopus	Queen's Wreath, Coral Vine		15	10	79	D	M, F	L, M	M	N	N	N	F		
Callaeum lilacaena (=Mascagnia)	Orchid Vine		12	5	20	D	F	L	H	N	N	N	F		
Campsis sp.	Trumpet Creeper		10	10	79	D	F	M	L	N	N	N	P	2	
Cissus trifoliata var. incisa	Grape Ivy, Arizona Grape Ivy		10	5	20	S	M	L, M	M	N	N	N	P, S		
Clematis ligusticifolia	Western Virgin's Bower	●	12	5	20	S	F	M	M	N	N	N	F, P, S	6	
Ficus pumila	Creeping Fig		10	5	20	E	M	M	M	N	N	N	P, S		
Gelsemium sempervirens	Carolina Jasmine		10	5	20	E	M	H	L	N	N	N	P	1	
Hardenbergia violacea	Happy Wanderer, Lilac Vine		10	5	20	E	M	H	L	N	N	N	P		
Jasminum mesnyi	Primrose Jasmine		10	5	20	E	M	M	L	N	N	N	P	1	
Lonicera japonica 'Halliana'	Hall's / Japanese Honeysuckle		15	10	79	E	F	M	M	N	N	Y	F, P		
Macfadyena unguis-cati	Cat's Claw Vine		15	10	79	S	M	L	L	N	N	Y	F, P	3	
Maurandya antirrhiniflora	Snapdragon Vine		8	5	20	D	M	L	M	N	N	N	F, P	6	
Parthenocissus sp. 'Hacienda Creeper'	Hacienda Creeper		15	10	79	D	F	L, M	M	N	N	N	F, P		
Polygonum aubertii	Silver Lace Vine		15	5	20	E	M	L	M	N	N	N	F, P		
Rosa banksiae	Lady Bank's Rose		15	10	79	E	M	M	M	Y	N	N	P, F	3	
Solanum jasminoides	Potato Vine		10	5	20	S, D	M, F	M	M	N	N	N	P, F	1, 4	
Tecomaria capensis	Cape Honeysuckle		8	5	20	E	M	L	L	N	N	Y	F, P	4	
Vitis arizonica	Canyon Grape	●	10	10	79	D	M	L	M	N	N	N	F	6	
Vitis californica	California Grape	●	10	10	79	D	M	L	M	N	N	N	F, P		
V. c. 'Roger's Red'	Rogers Red Grape	●	10	10	79	D	M	L	M	N	N	N	F, P		
Vitis sp.	Grape		10	10	79	D	M	L	M	N	N	Y	F, P	1	
AGAVES, CACTI, SUCCULENTS, AND YUCCAS															
Agave americana	Century Plant		5	8	50	E	M	L	H	Y	Y	N	F		
A. a. var. aurea-marginata	Yellow Margin Century Plant		4	5	20	E	S	L	H	Y	Y	N	F, P		
A. a. var. medio-picta	Medio Picta Century Plant		4	6	28	E	S	L	H	Y	Y	N	F		
Agave angustifolia var. marginata	Variegated Agave		3	3	7	E	S	L	H	Y	Y	N	F, P		
Agave bovicornuta	Cow's Horn Agave		4	4	13	E	F	L	H	Y	N	N	P		
Agave bracteosa	Green Spider Agave		1	1	1	E	S	L	H	N	N	N	F, P		
Agave colorata	Mescal Ceniza		3	3	7	E	M	L	H	Y	Y	N	F		
Agave desmettiana	Smooth Agave		3	3	7	E	F	L	H	Y	Y	N	F, P		
Agave filifera	Thread-leaf Agave, Dark Green Agave		2	2	3	E	M	L	H	Y	Y	N	F, P		
Agave geminiflora	Twin-Flowered Agave		3	4	13	E	M	L	H	Y	Y	N	F, P, S		
Agave havardiana	Havard Agave		3	4	13	E	M	L	H	Y	Y	N	F, P		
Agave montana	Mountain Agave		4	5	20	E	S	L	H	Y	Y	N	F, P		
Agave multiflora	Chahuíqui		3	4	13	E	S	L, M	M	Y	Y	N	F, P		

KEY														
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established. Height, Width, Coverage at mature growth. Type: Deciduous, Evergreen, Semi-evergreen Growth Rate: Slow, Medium, Fast Water Use: Very Low, Low, Medium, High Drought Tolerance: Low, Medium, High Exposure: Full sun, Partial shade, Shade		Comments: 1. Organic mulch recommended. 2. Many cultivars. 3. Some species may form dense thickets. 4. Not cold hardy below 28°F. 5. Invasive species. 6. Mojave native. 7. Toxic (parts specified). 8. May be trained as a small tree. 9. Needs a protected site (north facing site or afternoon shade).												
BOTANICAL NAME	COMMON NAME	"Bulletproof"	Height (average) (feet)	Width (average) (feet)	Coverage (sq. feet)	Type D, E, S	Growth Rate S, M, F	Water Use VL, L, M, H	Drought Tolerance L, M, H	Spines or Thorns Yes or No	Physical Barrier Yes or No	Hedge or Screen Yes or No	Exposure F, P, S	COMMENTS
AGAVES, CACTI, SUCCULENTS, AND YUCCAS (continued)														
<i>Agave murpheyi</i>	Murphey's Agave		3	3	7	E	M	L	H	Y	N	N	F	
<i>Agave ocahui</i>	Agave Ocahui		2	3	7	E	S	VL	H	Y	Y	N	F	
<i>Agave ovatifolia</i>	Whale's Tongue Agave		3	4	13	E	S,M	L	H	Y	Y	N	F, P	
<i>Agave palmeri</i>	Palmer's Agave		3	3	7	E	S	L	H	Y	Y	N	F	
<i>Agave parrasana</i>	Cabbage Head Agave		2	2	3	E	S	L	H	Y	Y	N	F, P	
<i>Agave parryi</i>	Parry's Agave		3	3	7	E	S	L	H	Y	Y	N	F	
<i>A. p. var. huachuensis</i>	Huachuca Agave		2	3	7	E	S	L	H	Y	Y	N	F, P	
<i>A. p. var. neomexicana</i>	New Mexico Agave		1	2	3	E	S	L, M	M	Y	Y	N	F, P	
<i>A. p. var. truncata</i>	Artichoke Agave		3	3	7	E	S,M	VL	H	Y	N	N	F, P	
<i>Agave salmiana</i> ssp. <i>ferox</i>	Ferox Agave		6	8	50	E	S,M	L, M	M	Y	Y	N	F, P	
<i>Agave scabra</i>	Rough-Leaved Agave		4	4	13	E	S	L	H	Y	Y	N	F	
<i>Agave schidigera</i> "Durango Delight" TM	Durango Delight Agave		2	3	7	E	F	L	H	Y	Y	N	F, P	
<i>Agave utahensis</i> ssp. <i>nevadensis</i>	Nevada Agave	●	1	1	1	E	S	VL	H	Y	N	N	F	6
<i>Agave victoriae-reginae</i>	Queen Victoria Agave	●	2	2	3	E	S	L	H	Y	N	N	F	
<i>Agave vilmoriniana</i>	Octopus Agave		4	4	13	E	F	M	M	N	N	N	F, P	
<i>Agave weberi</i>	Weber Agave		5	8	50	E	M,F	L	H	Y	Y	N	F, P	
<i>Aloe arborescens</i>	Tree Aloe		6	6	28	E	S	L	M	Y	N	N	F, P	4
<i>Aloe barbadensis</i>	Aloe Vera		2	2	3	E	S,M	L	M	Y	N	N	F, P	
<i>Aloe ferox</i>	Tap Aloe, Cape Aloe		6	5	20	E	S	L	M	Y	N	N	F, P	4
<i>Aloe nobiliss</i>	Gold Tooth Aloe		1	1	1	E	S,M	L	M	Y	N	N	F, P	
<i>Aloe saponaria</i>	African Aloe		2	1	1	E	M	L	M	Y	N	N	P	
<i>Aloe x 'Blue Elf'</i>	Blue Elf Aloe		2	2	3	E	S,M	M	M	Y	N	N	P, S	
<i>Aloe x spinosissima</i>	Spider Aloe		3	3	7	E	S	L	H	Y	N	N	P	
<i>Carnegiea gigantea</i>	Saguaro (spear)		12	2	3	E	S	L	H	Y	Y	N	F	
<i>Carnegiea gigantea</i>	Saguaro (with arms)		20	6	28	E	S	L	H	Y	Y	N	F	
<i>Cereus hildmannianus</i> (= <i>peruvianus</i>)	Peruvian Apple		8	3	7	E	M	L	H	Y	Y	N	F	4
<i>Cylindropuntia acanthocarpa</i> (= <i>Opuntia</i>)	Buckhorn Cholla	●	6	6	28	E	M	L	H	Y	Y	N	F	6
<i>Cylindropuntia arbuscula</i> (= <i>Opuntia</i>)	Pencil Cholla	●	8	3	7	E	M	L	H	Y	Y	N	F	
<i>Cylindropuntia bigelovii</i> (= <i>Opuntia</i>)	Teddy Bear Cholla	●	6	4	13	E	M	L	H	Y	Y	N	F	6
<i>Cylindropuntia echinocarpa</i> (= <i>Opuntia</i>)	Silver Cholla	●	3	4	13	E	M	L	H	Y	Y	N	F	6
<i>Cylindropuntia fulgida</i> (= <i>Opuntia</i>)	Chain-Fruit Cholla, Jumping Cactus		8	5	20	E	M	L	H	Y	Y	N	F	
<i>Cylindropuntia ramosissima</i> (= <i>Opuntia</i>)	Diamond Cholla	●	3	5	20	E	S,M	L	H	Y	Y	N	F	6
<i>Cylindropuntia versicolor</i> (= <i>Opuntia</i>)	Staghorn Cholla	●	6	5	20	E	M	L	H	Y	Y	N	F	
<i>Dasylirocn acrotriche</i>	Green Desert Spoon	●	5	6	28	E	M	L	H	Y	Y	N	F	
<i>Dasylirocn longissimum</i>	Stick Palm, Mexican Grass Tree	●	8	6	28	E	M	L	H	Y	Y	N	F	
<i>Dasylirocn wheeleri</i>	Desert Spoon	●	5	6	28	E	M	L	H	Y	Y	N	F	
<i>Echinocactus grusonii</i>	Golden Barrel		2	3	7	E	M	L	H	Y	Y	N	F	
<i>Echinocactus polycephalus</i>	Cottontop Cactus	●	2	3	7	E	S	VL	H	Y	N	N	F	6
<i>Echinocereus engelmannii</i>	Strawberry Hedgehog	●	1	3	7	E	S	L	H	Y	N	N	F	6
<i>Echinocereus triglochidiatus</i>	Claret Cup	●	1	2	3	E	S,M	L	H	Y	N	N	F	6
<i>Escobaria vivipara</i> (= <i>Coryphantha</i>)	Common Pincushion	●	1	1	1	E	S,M	L	H	Y	N	N	F, P	6
<i>E. v. var. bisbeana</i>	Beehive Cactus	●	1	1	1	E	S,M	L	H	Y	N	N	F, P	
<i>Ferocactus acanthodes</i> (= <i>Cylindraceus</i>)	Compass Barrel Cactus	●	6	2	3	E	S	L	H	Y	N	N	F	6
<i>Ferocactus wislizenii</i>	Fishhook Barrel Cactus	●	6	2	3	E	S,M	L	H	Y	N	N	F	
<i>Fouquieria splendens</i>	Ocotillo	●	12	6	28	D	S	L	H	Y	Y	N	F, P	6
<i>Hesperaloe campanulata</i>	Bell-flowered Hesperaloe		3	3	7	E	M	L	H	N	N	Y	F, P	
<i>Hesperaloe funifera</i>	Giant Sword Flower	●	6	6	28	E	M	L	H	N	N	Y	F	
<i>Hesperaloe nocturna</i>	Night Blooming Yucca	●	5	6	28	E	M	L	H	N	N	Y	F	
<i>Hesperaloe parviflora</i>	Red Yucca	●	3	3	7	E	M	L	H	N	N	Y	F	
<i>H. p. 'Yellow'</i>	Yellow Yucca	●	3	3	7	E	M	L	H	N	N	Y	F	
<i>Mammillaria tetrandra</i>	Pincushion / Fishhook Cactus	●	1	1	1	E	S,M	L	H	Y	N	N	F, P	6
<i>Nolina bigelovii</i>	Bigelow's Nolina	●	6	4	13	E	M	L	H	N	N	Y	F	6
<i>Nolina matapensis</i>	Treebear Grass	●	12	6	28	E	M	L	H	N	N	Y	F	
<i>Nolina microcarpa</i>	Bear Grass	●	4	5	20	E	M	L	H	N	N	Y	F	
<i>Nolina nelsoni</i>	Blue Nolina	●	5	5	20	E	M	L	H	N	N	Y	F	
<i>Nolina texana</i>	Texas Bear Grass, Devil's Shoestring	●	3	3	7	E	M	L	H	N	N	Y	F	
<i>Opuntia basilaris</i>	Beavertail Cactus	●	1	4	13	E	M	L	H	Y	Y	N	F	6
<i>Opuntia chlorotica</i>	Pancake Prickly Pear	●	4	5	20	E	M	L	H	Y	Y	N	F	6
<i>Opuntia engelmannii</i>	Englemann's Prickly Pear	●	6	6	28	E	S,M	L	H	Y	Y	N	F, P	6
<i>O. e. acicularis</i>	Bristly Prickly Pear	●	8	10	79	E	M	L	H	Y	Y	N	F, P	
<i>O. e. linguiformis</i>	Cow's Tongue, Angel's Wing Cactus	●	6	8	50	E	M	L	H	Y	Y	N	F	
<i>Opuntia erinacea</i> 'erinacea'	Old Man Prickly Pear	●	2	3	7	E	S,M	L	H	Y	Y	N	F	6
<i>Opuntia ficus-indica</i>	Indian Fig Cactus	●	15	10	79	E	M,F	L	M	N	Y	Y	F	
<i>Opuntia macrocentra</i>	Black Spine Prickly Pear	●	4	3	8	E	M	L	H	N	Y	N	F	
<i>Opuntia microdasys</i>	Bunny Ears	●	3	5	20	E	M	L	H	Y	Y	N	F	
<i>Opuntia phaeacantha</i>	Mojave Prickly Pear	●	3	6	28	E	S	L	H	Y	Y	N	F	6

KEY		"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established.														
Height, Width, Coverage at mature growth.		1. Organic mulch recommended.												
Type: Deciduous, Evergreen, Semi-evergreen		2. Many cultivars.												
Growth Rate: Slow, Medium, Fast		3. Some species may form dense thickets.												
Water Use: Very Low, Low, Medium, High		4. Not cold hardy below 28°F.												
Drought Tolerance: Low, Medium, High		5. Invasive species.												
Exposure: Full sun, Partial shade, Shade		6. Mojave native.												
		7. Toxic (parts specified).												
		8. May be trained as a small tree.												
		9. Needs a protected site (north facing site or afternoon shade).												
BOTANICAL NAME	COMMON NAME	(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
AGAVES, CACTI, SUCCULENTS, AND YUCCAS (continued)														
Opuntia paraguayensis	Paraguay Cactus, Orange Tuna Cactus		6	4	13	E	M	L	M	Y	Y	N	F, P	
Opuntia riviervana	Orange Tuna Cactus	●	5	8	50	E	M	L	H	Y	Y	N	F	
Opuntia robusta	Silver Dollar Cactus, Giant Prickly Pear	●	18	10	79	E	M	L	H	Y	Y	N	F	
Opuntia santa rita 'Tubac' (= O. violacea 'Santa Rita')	Purple Prickly Pear, Purple Pancake	●	4	6	28	E	M	L	H	Y	Y	N	F	
Opuntia turpinii (= Tephrocactus)	Pine Cone Prickly Pear, Paper Spine Cactus	●	1	2	3	E	M	L	H	N	N	N	P	
Oreocereus celsianus	Old Man Of the Andes		6	2	3	E	M	L	H	Y	N	N	F, P	
Tephrocactus articulatus	Paper Spine Cactus, Pine Cone Cactus		1	3	7	E	S	L	M	Y	Y	N	F, P	
Trichocereus pachanoi (= Echinopsis)	San Pedro Cactus		8	6	28	E	M	L	H	Y	N	N	F	
Trichocereus spachianus (= Echinopsis)	Golden Torch Cactus		6	3	7	E	S, M	L	H	Y	N	N	F, P	2
Trichocereus sp (= Echinopsis)	Cacti		15	3	7	E	M	L	H	Y	N	N	F	
Yucca aloifolia	Spanish Bayonet		8	8	50	E	S	L	H	Y	Y	N	F	
Yucca australis	Australis Yucca		30	10	79	E	S	L	H	Y	N	N	F	
Yucca baccata	Banana Yucca	●	4	6	28	E	S	L	H	Y	Y	N	F, P	6
Yucca brevifolia	Joshua Tree	●	15	10	79	E	S	L	H	Y	N	N	F	6
Yucca constricta	Constricta Yucca		4	3	7	E	S	L	H	Y	N	N	F	
Yucca elata	Soaptree Yucca	●	10	8	50	E	S	L	H	Y	N	N	F, P	
Yucca faxoniana	Palm Yucca	●	12	6	28	E	S	L	H	Y	N	N	F	
Yucca filamentosa	Adam's Needle		3	3	7	E	M	L	H	Y	Y	N	F, P	
Yucca glauca	Soapweed, Narrowleaf Yucca		3	4	13	E	S	L	H	Y	Y	N	F	
Yucca gloriosa	Spanish Dagger		10	8	50	E	S, M	L	H	N	N	N	F, P	
Yucca harimaniae	Harriman's Yucca	●	1	1	1	E	S	L	H	Y	N	N	F	
Yucca pallida	Pale Leaf Yucca		1	2	3	E	S	L	H	Y	N	N	F	
Yucca recurvifolia	Weeping Yucca, Pendulous Yucca		6	6	28	E	S	L	H	Y	N	N	F, P	
Yucca rigida	Blue Yucca	●	12	3	7	E	M	L	H	Y	N	N	F	
Yucca rostrata	Beaked Yucca	●	10	3	7	E	S, M	L	H	Y	N	N	F	
Yucca rupicola	Twisted Yucca	●	2	3	7	E	S	L	H	N	N	N	F, P	
Yucca schidigera	Mojave Yucca	●	8	8	50	E	S	L	H	Y	N	N	F	6
Yucca schottii	Mountain Yucca		12	5	20	E	S, M	L	H	Y	N	N	F, P	
Yucca thompsoniana	Thompson's Yucca		10	8	50	E	S	L	H	Y	Y	N	F	
Yucca torreyi	Torrey Yucca		15	6	28	E	S	L	H	Y	Y	N	F	
Yucca whipplei	Our Lord's Candle, Chaparral Yucca	●	3	6	28	E	S	L	H	Y	Y	N	F	6
ORNAMENTAL GRASSES														
Achnatherum hymenoides (=Oryzopsis)	Indian Ricegrass	●	1	1	1	D	F	VL	H	N	N	N	F	6
Achnatherum speciosum	Desert Needlegrass	●	1	1	1	D	F	VL	H	N	N	N	F	6
Aristida purpurea	Purple Threeawn	●	2	2	3	E	F	L	H	N	N	N	F	5, 6
Bouteloua curtipendula	Side-Oats Grama	●	2	2	3	D	F	L	H	N	N	N	F, P	6
Bouteloua gracilis	Blue Grama Grass	●	2	2	3	E	F	VL	H	N	N	N	F	6
Calamagrostis x acutifolia	Feather Reed Grass	●	3	3	7	E	F	L	H	N	N	N	F, P	
Cortaderia selloana	Pampas Grass	●	8	15	177	E	F	L	H	N	Y	Y	F, P	5
C. s. 'Pumila'	Dwarf Pampas Grass	●	4	4	13	E	F	L	H	N	Y	Y	F, P	5
Festuca ovina	Blue Fescue		1	1	1	E	F	M	M	N	N	N	F	2
F. o. var. brachyphylla	Sheep Fescue		1	1	1	E	F	M	M	N	N	N	F	6
Helictotrichon sempervirens	Blue Oat Grass	●	2	2	3	E, S	M	M	M	N	N	N	F	
Miscanthus sinensis	Maiden Grass, Japanese Silver Grass		5	4	12	D	M	M	M	N	N	N	F, P	
M. s. 'Variegata'	Variegated Maiden Grass		5	4	12	D	M	M	M	N	N	N	F, P	
Muhlenbergia capillaris 'Regal Mist'	Regal Mist Muhly Grass	●	3	3	7	D	F	L	M	N	N	N	F, P	
Muhlenbergia dumosa	Bamboo Muhly, Fairy Bamboo		4	4	13	E, S	M, F	L, M	M	N	N	N	F, P	
Muhlenbergia emersleyi 'El Toro'	Bull Grass	●	3	3	7	E	F	VL	H	N	N	N	F, P	
Muhlenbergia lindheimeri 'Autumn Glow'	Autumn Glow	●	5	5	20	D	F	L	H	N	N	Y	F, P	
Muhlenbergia rigens	Deer Grass	●	4	4	13	D	M	M	H	N	N	N	F, P	6
Muhlenbergia rigida 'Nashville'	Nashville	●	2	2	3	E	M	M	H	N	N	N	F, P	
Nasella tenuisima (=Stipa tenuisima)	Mexican Feather Grass		2	2	3	D	M	M	M	N	N	N	F, P	5
Ophiopogon japonicus	Mondo Grass		1	1	1	E	M	M	L	N	N	N	P, S	2
Pennisetum alopecuroides	Black Moudry		5	5	20	S	F	M	L	N	N	Y	F, P	2
Pennisetum setaceum 'Rubrum' 'Cupreum'	Purple Fountain Grass		4	3	7	S	F	M	L	N	N	Y	F	
Phyllostachys aurea	Golden Bamboo		15	10	79	D	F	M	L	N	Y	Y	F, P	3, 5
Pleuraphis rigida (= Hilaria rigida)	Big Galleta Grass	●	3	2	3	S	F	VL	H	N	N	N	F	6
Sorghastrum nutans	Indian Grass		4	2	3	S	F	M	M	N	N	N	F	
Sporobolus airoides	Alkali Sacaton Grass	●	4	2	3	D	M	L	M	N	N	N	F	6
Stipa gigantea	Giant Feather Grass, Golden Oats		3	2	3	S	M	M	L	N	N	N	F	
PERENNIALS (small accent areas only)														
Achillea filipendulina	Fern Leaf Yarrow		3	3	7	E	F	L	M	N	N	N	F	2
Agapanthus africanus	Lily of the Nile		3	3	7	E	M	M	L	N	N	N	P	1
Amsonia tomentosa	Desert Bluestar	●	1	1	1	D	M	VL	H	N	N	N	F	6
Anemopsis californica	Yerba Mansa		1	1	1	D	M	M	L	N	N	N	P, S	6, 7 (leaves)

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Growth Rate: Slow, Medium, Fast															3. Some species may form dense thickets.												
Water Use: Very Low, Low, Medium, High															4. Not cold hardy below 28°F.												
Drought Tolerance: Low, Medium, High															5. Invasive species.												
Exposure: Full sun, Partial shade, Shade															6. Mojave native.												
															7. Toxic (parts specified).												
															8. May be trained as a small tree.												
															9. Needs a protected site (north facing site or afternoon shade).												
BOTANICAL NAME															COMMON NAME		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S
PERENNIALS (continued)																											
Artemisia ludoviciana	Prairie Sage	●	3	3	7	D	F	L	M	N	N	N	N	F,P	6												
A. l. albula 'Silver King'	Silver King Artemisia	●	3	3	7	D	F	L	M	N	N	N	N	F,P													
Artemisia x 'Powis Castle'	Powis Castle Wormwood	●	2	3	7	E	F	L	M	N	N	N	N	F,P													
Artemisia schmidtiana 'Silver Mound'	Angel's Hair, Silver Mound Artemisia		1	2	3	E	M	L	M	N	N	N	N	F, P													
Astragalus preussii	Preuss' Milkvetch	●	2	2	3	D	F	VL	H	N	N	N	N	F	6												
Baileya multiradiata	Desert Marigold	●	1	2	3	D	M	L	H	N	N	N	N	F	6												
Berlandiera lyrata	Chocolate Flower	●	1	2	3	E	F	L	H	N	N	N	N	F, P													
Convolvulus tricolor	Dwarf Morning Glory		1	2	3	D	F	L	L	N	N	N	N	F,P													
Coreopsis lanceolata	Sunray		1	1	1	S	F	M	L	N	N	N	N	F													
Echinacea purpurea	Purple Coneflower		3	2	3	S	M	M	L	N	N	N	N	F,P	1												
Enceliopsis argophylla	Silverleaf Sunray	●	1	1	1	S	F	VL	H	N	N	N	N	F	6												
Epilobium canum (=Zauschneria californica)	Hummingbird Flower		3	4	13	D	M	L	M	N	N	N	N	F,P	3												
Erigeron divergens	Native Fleabane	●	1	3	7	E	F	VL	H	N	N	N	N	F,P	6												
Erigeron karvinskianus	Santa Barbara Daisy, Mexican Daisy		1	3	7	E	F	L	H	N	N	N	N	F, P													
Eschscholzia californica	California Poppy, Golden Poppy		1	1	1	D	F	L	M	N	N	N	N	F	6												
Gaillardia aristata (=grandiflora)	Blanket Flower		2	2	3	E	F	M	L	N	N	N	N	F													
Gaura coccinea	Scarlet Gaura	●	1	2	3	D	F	L	H	N	N	N	N	F,P	6												
Gaura lindheimeri	Gaura		3	4	13	D	M	M	L	N	N	N	N	F,P	2												
Gazania rigida	Gazania		1	1	1	E	M	L	M	N	N	N	N	F,P													
Iberis sempervirens	Evergreen Candytuft		1	2	3	E	M	L	L	N	N	N	N	F,P													
Ipomopsis arizonica (=Gilia aggregata)	Skyrocket	●	2	1	1	E	F	L	H	N	N	N	N	F,P,S	6												
Kallstroemia grandiflora	Arizona Poppy, Orange Caltrop		1	1	1	S	F	L	M	N	N	N	N	F													
Lavandula sp.	Lavender		2	3	7	E	F	M	M	N	N	N	N	F	2												
Lepidium fremontii	Desert Alyssium	●	2	2	3	D	F	VL	H	N	N	N	N	F	6												
Liatris spicata	Gayfeather, Blazing Star		2	2	3	S	M	L, M	M	N	N	N	N	F, P													
Linum lewisii	Blue Flax		2	1	1	D	M	L	M	N	N	N	N	F	6												
Lippia repens	Lippia		1	2	3	S	M	L	M	N	N	N	N	F,P													
Liriope gigantea	Giant Lily Turf		2	2	3	S	F	M	L	N	N	N	N	P, S													
Liriope muscari	Lily Turf		1	1	1	E	F	M	L	N	N	N	N	P, S													
Lobularia maritima	Sweet Alyssum		1	1	1	S	M	M	L	N	N	N	N	F, P	1												
Manfreda maculosa	Texas Tuberose, Spice Lily		1	1	1	D	S,M	L, M	M	N	N	N	N	P, S													
Melampodium leucanthum	Blackfoot Daisy		1	2	3	S	M	L	M	N	N	N	N	F,P													
Oenothera caespitosa	Angel Wing/White Evening Primrose	●	1	2	3	E	F	M	L	N	N	N	N	F,P	6												
Oenothera elata (=O. hookeri)	Hooker's Evening Primrose		3	1	1	D	F	M	M	N	N	N	N	F,P,S	5, 6												
Osteospermum fruticosum	African Trailing Daisy, Freeway Daisy		1	4	13	E, S	M,F	M	M	N	N	N	N	F,P,S													
Penstemon amplexicaulis	Mexican Blue Penstemon		1	2	3	S	M	L, M	M	N	N	N	N	F, P													
Penstemon baccharifolius 'Del Rio'	Del Rio Penstemon		3	3	7	S	M	L	M	N	N	N	N	F, P													
Penstemon barbatus	Scarlet Bugler, Scarlet Beardtongue		4	2	3	E	M	L	M	N	N	N	N	F, P													
Penstemon bicolor	Pinto Beardtongue	●	2	2	3	E	F	VL	H	N	N	N	N	F	6												
P. b. ssp.roseus	Rosy Two-tone Beardtongue	●	2	2	3	S	F	L	H	N	N	N	N	F,P,S	6												
Penstemon eatonii	Firecracker Penstemon	●	3	2	3	E	M	L	H	N	N	N	N	F, P	6												
Penstemon palmeri	Scented Penstemon	●	4	2	3	E	F	VL	H	N	N	N	N	F	6												
Penstemon parryi	Parry's Penstemon	●	2	3	7	E	F	L	H	N	N	N	N	F, P													
Penstemon pseudospectabilis	Canyon Penstemon	●	2	4	13	E	F	L	H	N	N	N	N	F													
Penstemon rostriflorus	Bridge Penstemon		2	1	1	E	M	L	H	N	N	N	N	F, P	6												
Penstemon strictus	Rocky Mountain Penstemon		2	2	3	E	F	L	M	N	N	N	N	F, P													
Penstemon superbus	Superb Penstemon, Coral Beardtongue		4	3	7	E	F	L, M	M	N	N	N	N	F, P													
Penstemon sp.	Penstemon		2	3	7	S	M,F	L	M	N	N	N	N	F	2												
Perovskia atriplicifolia	Russian Sage	●	3	2	3	D	M	L	H	N	N	N	N	F,P													
Psilostrophe cooperi	Paper Flower	●	2	3	7	D	F	L	H	N	N	N	N	F,P	6												
Psilostrophe tagetina	Wooly Paper Flower	●	2	3	7	D	F	L	H	N	N	N	N	F,P													
Ratibida columnifera	Mexican Hat		1	2	3	D	F	L	H	N	N	N	N	F,P													
Rudbeckia hirta	Black-eyed Susan		2	2	3	D	F	L	H	N	N	N	N	F,P													
Ruellia brittoniana	Wild Petunia		2	3	7	E	F	L	H	N	N	N	N	F,P,S	5												
R. b. vars. 'Katie', 'Rosa', 'Blanca'	Dwarf Ruellia		1	2	3	E	M	M	M	N	N	N	N	F, P													
Sphaeralcea ambigua	Globe Mallow	●	3	3	7	S	F	L	H	N	N	N	N	F,P,S	2, 6												
Stanleya pinnata	Desert Prince's Plume	●	4	3	7	D	F	VL	H	N	N	N	N	F	6												
Tagetes lemmonii	Mountain Marigold		4	4	13	S	F	M	M	N	N	N	N	F													
Tagetes lucida	Mexican Tarragon, Mexican Marigold		3	3	7	S	M,F	M	M	N	N	N	N	F,P													
Tetranneuris acaulis (=Hymenoxys)	Angelita Daisy	●	1	1	1	E	M	L, M	M	N	N	N	N	F,P													
Thymophylla pentachaeta (=Dyssodia)	Golden Dogbane, Golden Dyssodia	●	1	2	3	E	F	VL	H	N	N	N	N	F	6												
Thymophylla tenuiloba (=Dyssodia)	Dahlberg Daisy	●	1	1	1	E	S	L	H	N	N	N	N	F													
Tulbaghia violacea	Society Garlic		1	1	1	S	M	M	M	N	N	N	N	F, P													
Viguiera parishii (=deltoidea)	Goldeneye	●	3	3	7	S	M	VL	H	N	N	N	N	F	6												
Xylorhiza tortifolia	Mojave Aster	●	1	1	1	D	M	VL	H	N	N	N	N	F	6												
Zinnia acerosa	Desert Zinnia	●	1	1	1	D	F	L	H	N	N	N	N	F,P													
Zinnia grandiflora	Prairie Zinnia		1	1	1	D	F	L	H	N	N	N	N	F,P													

KEY			"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established.															
Height, Width, Coverage at mature growth.			1. Organic mulch recommended.												
Type: Deciduous, Evergreen, Semi-evergreen			2. Many cultivars.												
Growth Rate: Slow, Medium, Fast			3. Some species may form dense thickets.												
Water Use: Very Low, Low, Medium, High			4. Not cold hardy below 28°F.												
Drought Tolerance: Low, Medium, High			5. Invasive species.												
Exposure: Full sun, Partial shade, Shade			6. Mojave native.												
			7. Toxic (parts specified).												
			8. May be trained as a small tree.												
			9. Needs a protected site (north facing site or afternoon shade).												
BOTANICAL NAME	COMMON NAME		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	V, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
PLANTS WITH SPECIAL NEEDS (NOT SUITABLE FOR ALL LOCATIONS)															
Shrub	Asparagus densiflorus 'Meyers'	Foxtail Fern	2	3	7	E	M	M	L	N	N	N	P, S	1	
Groundcover	A. d. 'Sprengeri'	Asparagus Fern	2	4	13	E	M	M	M	N	N	N	P, S	1, 4	
Shrub	Aspidistra elatior	Cast Iron Plant	2	2	3	E	M	H	L	N	N	N	S	1	
Shrub	Aucuba japonica 'Variegata'	Gold Dust Plant	8	8	50	E	S	M	M	N	N	N	S	1	
Shrub	Berberis aquifolium (=Mahonia)	Oregon Grape	4	5	20	E, S	S	L	M	Y	Y	Y	P, S	1	
Vine	Bougainvillea sp.	Bougainvillea	10	5	20	D	M	M	M	Y	Y	N	S	4	
Perennial	Canna hybrids	Canna	6	3	7	D	F	M, H	L	N	N	N	P	1, 2	
Agave, etc	Cephalocereus senilis	Old Man Cactus	6	4	13	E	S	L	M	Y	Y	N	P	4	
Perennial	Cuphea ilavea	Bat-faced Cuphea	2	3	7	E	M	H	L	N	N	N	P	1	
Perennial	Dietes bicolor	Fortnight Lily, Evergreen Iris	2	2	3	E	M	M	M	N	N	N	P, S	1	
Perennial	Dietes vegeta (=iridioides)	Butterfly Iris, African Iris	2	2	3	E	M	M	M	N	N	N	P, S	1	
Perennial	Erysimum linifolium	Wallflower	2	2	3	E	M	L, M	M	N	N	N	P	1	
Shrub	Euryops pectinatus	Yellow Bush Daisy, Euryops Daisy	3	3	7	E	F	L	H	N	N	Y	F	1	
Shrub	E. p. 'Viridis'	Green Bush Daisy	3	3	7	E	F	L	H	N	N	Y	F	1	
Shrub	Fatsia japonica	Japanese Aralia	6	6	28	E	F	H	L	N	N	N	S	1	
Shrub	Genista racemosa	Sweet Broom	6	6	28	E	F	M	M	N	N	N	F	1	
Vine	Hedera canariensis	Algerian Ivy	10	5	20	E	F	M, H	L, M	N	N	N	P, S	1	
Vine	Hedera helix	English Ivy	10	5	20	E	F	M, H	L, M	N	N	N	P, S	1, 7(all parts)	
Perennial	Hemerocallis hybrids	Daylily Hybrids	2	2	3	E	M	M, H	L	N	N	N	P	1, 2	
Shrub	Hibiscus sp.	Hibiscus	4	4	13	D, E	M	M, H	L	N	N	N	P	1, 2, some 4	
Shrub	Hyptis emoryi	Desert Lavender	6	6	28	S	S, M	L	H	N	N	N	F, P	4, 6	
Shrub	Ilex altacolarensis 'Wilsonii'	Wilson Holly	15	10	79	E	M	M	M	Y	Y	Y	F, P	8	
Shrub	Ilex cornuta	Chinese Holly	8	8	50	E	M	M	M	Y	Y	Y	F, P		
Shrub	I. c. 'Burfordii'	Burford Holly	8	8	50	E	M	M	M	Y	Y	Y	F, P		
Shrub	I. c. 'Burfordii Nana'	Dwarf Burford Holly	6	6	28	E	M	M	M	N	Y	Y	F, P		
Shrub	Ilex vomitoria 'Nana'	Dwarf Yaupon Holly	3	3	7	E	M	M	M	N	Y	Y	F, P		
Shrub	Ilex sp.	Holly	20	10	79	D, E	S	M	M	Y	Y	Y	F, P	1, 2	
Perennial	Iris sp.	Iris	3	2	3	D, S	M	M, H	L	N	N	N	P	1, 2, some 4	
Vine	Jasminum polyanthum	Pink Jasmine	10	5	20	S	M, F	M	M	N	N	N	P	1	
Shrub	Lagerstroemia indica dwarf	Dwarf Crape Myrtle	6	6	28	D	S	M	M	N	N	N	F, P	1, 2	
Shrub	Ligustrum japonicum	Waxleaf Privet, Japanese Privet	8	8	50	E	S	M	M	N	Y	Y	P, S	1	
Shrub	Ligustrum lucidum	Glossy Privet	8	8	50	E	S	M	M	N	Y	Y	P, S	1	
Shrub	Nandina domestica	Heavenly Bamboo	6	4	13	E, S	S	L	M	N	Y	Y	P, S	1	
Shrub	N. d. 'Nana'	Dwarf Heavenly Bamboo	4	3	7	E, S	S	L	M	N	Y	Y	P, S	1	
Vine	Parthenocissus quinquefolia	Virginia Creeper	10	5	20	D, S	F	M	L	N	N	N	P, S	1, 5	
Vine	Parthenocissus tricuspidata	Boston Ivy, Japanese Creeper	10	5	20	D, S	F	M	L	N	N	N	P	1	
Shrub	Phoenix roebelenii	Pygmy Date Palm	6	7	38	E	S, M	M	L	Y	N	N	P	4	
Shrub	Phormium sp.	Flax	3	3	7	E	M	M	L	N	N	N	P	1, 2, some 4	
Shrub	Photinia x fraseri	Redtip Photinia, Fraser's Photinia	8	6	28	E	S	M	M	N	Y	Y	P, S	1	
Shrub	Pittosporum tobira	Japanese Mock Orange	8	8	50	E	S	M	M	N	Y	Y	P, S	1	
Shrub	P. t. 'Variegata'	Variegated Mock Orange	8	8	50	E	S	M	M	N	Y	Y	P, S	1	
Shrub	P. t. 'Wheeler's Dwarf'	Wheeler's Dwarf Mock Orange	2	4	13	E	S	M	M	N	N	N	P, S	1	
Shrub	Platycladus orientalis	Oriental Arborvitae	20	10	79	E	S	M	M	N	Y	Y	P, S	1, 2	
Shrub	P. o. 'Aurea Nana'	Golden Arborvitae	4	2	3	E	S	M	M	N	Y	Y	P, S	1	
Shrub	Podocarpus gracillor	Fern Pine	10	3	7	E	S	M	M	N	Y	Y	P, S	1	
Shrub	Prunus caroliniana 'Compacta'	Compact Carolina Cherry	8	6	28	E	S	M	M	N	Y	Y	P, S	1	
Shrub	Raphiolepis indica	Indian Hawthorn	4	4	13	E	S	L	M	N	N	N	P, S	1, 2	
Groundcover	Stachys byzantina	Lamb's Ear	1	2	3	E	F	M	M	N	N	N	P	1	
Agave, etc	Stenocereus thurberi	Organ Pipe Cactus	10	3	7	E	S	L	H	Y	Y	N	F, P	4	
Vine	Trachelospermum asiaticum	Asiatic Jasmine	10	5	20	E	S	M	M	N	N	N	P, S	1	
Vine	Trachelospermum jasminoides	Star Jasmine	10	5	20	E	S	M	M	N	N	N	P, S	1	
Shrub	Viburnum sp.	Viburnum	8	8	50	E	S	M	M	N	Y	Y	P, S	1	
Vine	Wisteria sinensis	Chinese Wisteria	10	8	20	D	F	M, H	L	N	N	N	P, F	1	
Perennial	Zephyranthes sp.	Fairy Lily, Rain Lily	1	1	1	E, D	M	M	L	N	N	N	P	2	
REFERENCES															
Floridata Plant Profile List: http://www.floridata.com/lists/contents.cfm															
Lady Bird Johnson Wildflower Center Native Plant Database: http://www.wildflower.org/plants/															
Learn2Grow Plants Search: http://www.learn2grow.com/plants/															
Mountain States Wholesale Nursery: http://www.mswm.com															
Sunset Plant Finder: http://plantfinder.sunset.com/sunset/															
United States Department of Agriculture Plants Database: http://plants.usda.gov/															
University of Arizona Arid Plant List: http://ag.arizona.edu/pima/gardening/aridplants/aridplant_botindex.html															

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Enjoy.



Southern Nevada Regional Planning Coalition

Recommended Best Practices For Urban Trees in Southern Nevada



January 24, 2012



On the cover: The District at Green Valley Ranch, Henderson, Nevada

Table of Contents

Executive Summary ii

Introduction iii

General Recommendations 1

Parking Lots..... 3

Public Facilities and Commercial Areas..... 6

Large Landscaped Areas and Open Space 8

Transportation Corridors 10

Utility Corridors 12

Definitions 14

Unless otherwise noted, the illustrations included herein were created by
Ramil Santiago for *Cleaner Air, Tree by Tree*.

Executive Summary

The purpose of this document is to promote good tree planting practices throughout the municipalities of Southern Nevada and to create consistency across jurisdictional boundaries to ensure that trees in urbanized areas thrive, grow to full maturity and provide the maximum benefit to our communities.

The recommended practices in this document are separated by types of development and organized by safety requirements, species selection, soil consideration, and design considerations. Whereas all of the recommendations promote good urban forestry principles, several of the recommendations should be considered for consistency and to achieve the greatest positive impact. They are as follows:

- Tree spacing based on mature tree size
- Number of understory plants based on landscape coverage, not arbitrary spacing
- Minimum sizes for planters (6' interior dimensions)
- Minimum soil surface areas based on mature tree sizes
- Permeable paving in hardscape areas
- Minimum proper soil volume based on mature tree size
- Structural soil beneath hardscape to promote root development
- Safe distances from overhead and underground utilities
- Maintain sight visibility clearances
- Maintain adequate distances from structures and provide root barriers where needed

Other practices listed herein may be implemented by local jurisdictions as applicable. As more of these practices are implemented, the greater the results—and the benefits—will be.

Introduction

The following recommended best practices for urban trees were based on *Cleaner Air, Tree by Tree*, a publication of the Nevada Division of Forestry funded through the USDA Forest Service. These practices are organized by potential planting locations and address species selection, soil considerations and design considerations for each location.

These recommendations have been compiled from professional arborists and landscape professionals with extensive experience in their fields. Adoption and implementation of these recommendations will have many positive impacts on the growth, development, health and longevity of urban trees.

Tree Benefits

Trees are assets to our communities. Unfortunately, trees—including those on public lands—are often seen not as assets but as burdens to operations and maintenance costs. However, trees provide many quantifiable benefits to the communities in which they are planted. These benefits increase as trees grow and continue to give back to the community throughout the life of the trees, making them more valuable as they mature. Indeed, it is said that trees are the only municipal asset that increase in value over time. Therefore it is in our best interest to help our urban trees to grow to full maturity in order to enjoy the greatest potential benefits they provide.

The benefits of urban trees can be calculated using software such as the USDA Forest Service's *i-Tree* or on-line at web sites such as the National Tree Benefit Calculator at www.treebenefits.com. Notable tree benefits include the following:

- Reducing water consumption through proper species selection and irrigation practices
- Decreasing building energy consumption by planting trees strategically to shade buildings
- Improving air quality by producing oxygen, sequestering carbon emissions, and filtering particulate matter out of the air
- Mitigating stormwater runoff
- Mitigating the urban heat island effect
- Providing wildlife habitat
- Providing visual buffers or buffers for wind and noise
- Increasing property values
- Promoting walkable neighborhoods
- Improving neighborhood aesthetics
- Improving community health and interaction

General Recommendations

In any urban environment, trees will have a better chance of surviving and thriving if the appropriate species are planted in the proper locations and are given appropriate care. This is especially true in the arid climate of the Mojave Desert, where high temperatures, low rainfall, and poor soils exist. The following recommendations should be considered for planting trees in any urban situation in Southern Nevada.

Safety Requirements

- **Call Before You Dig** (Nevada: 1.800.227.2600 or 811) if boring, tunneling, trenching or digging. Call at least two days before work will begin so that underground utilities are located and marked.
- **Call Before You Crane** (NV Energy: 702.227.2929) if overhead power lines are in close proximity to the work site and a crane or other equipment is to be used.
- Locate trees away from aboveground and underground utilities. See Utility Corridors section for specific clearances and additional information.

Species Selection

- Use low-water use species (i.e., native species or desert adapted species) whenever practicable.
- Consider planting low *biogenic volatile organic compound* (BVOC) emitting trees.
- When planting rows of trees include a variety of species to avoid monocultures and noticeable gaps after dead or injured trees are removed and a smaller tree is replanted.
- Match the species mature size to the available growing space.
- Do not plant trees or plants with a mature height over 24 inches in sight visibility zones near driveways or intersections.
- See the SNRPC Regional Plant List for site-appropriate species.
- Plant quality nursery stock that meets Arizona Nursery Association Standards or the American National Standards Institute for Nursery Stock (ANSI Z60.1-2004).

Soil Considerations

- Providing adequate soil volume for healthy root growth is the critical factor for successfully growing healthy trees. Per Casey Trees, “published research suggests that trees need 1 to 2 cubic feet of soil volume for every square foot of crown area spread.” See **Table 1** below for recommended minimum soil volumes.
- Ideally, enough exposed soil surface area should be provided to allow the roots to grow at least to the dripline of a mature tree. See **Table 1** below for recommended open soil surface areas.
- The minimum soil depth recommended for proper root growth is two to three feet.
- Planting pits should be excavated to a depth appropriate to the size of the root ball and 2 to 3 times the diameter of the root ball.
- Remove construction debris from planting pits and backfill with soil composed of 75% native soil and 25% soil amendment (may not apply to native species).

- Consider using *structural soil* beneath areas of pavement to increase the volume of soil available to tree roots.
- For hardscape areas, consider using *pervious concrete* or pavers in combination with *structural soil*. *Pervious concrete* and pavers accommodate pedestrians and vehicles, allow for increased moisture flow to tree roots, and allow for gas exchange between the roots and soil surface.

Table 1

Recommended Tree Species Size Categories	Average Canopy Size	Minimum Open Soil Surface Area (Per Tree)	Minimum Open Soil Surface Area For Planting Strips (Per Tree)	Minimum Soil Volume (Per Tree)
Small	16 ft x 16 ft	81 ft ² (9 ft x 9 ft)	84 ft ² (6 ft x 14 ft)	201 cu. ft.
Medium	22 ft x 22 ft	121 ft ² (11 ft x 11 ft)	120 ft ² (6 ft x 20 ft)	380 cu. ft.
Large	28 ft x 28 ft	196 ft ² (14 ft x 14 ft)	198 ft ² (6 ft x 33 ft)	615 cu. ft.

Design Considerations

- Minimum tree spacing based on mature species size.
- Provide understory plantings to ensure trees receive adequate irrigation because they shade the soil, prevent evaporation and provide extra emitters within the planting area. Understory plantings should cover a minimum of 50% of landscaped areas based on the mature size of the plants.
- For trees planted within 10 feet of sidewalks and curbs, install root barriers along sidewalks and curbs to reduce tree roots from heaving and breaking pavers, sidewalks, curbs, and road pavement.
- Plant trees only where there is adequate room, both overhead and underground, for the mature size of the tree being planted.
- Provide appropriate irrigation in xeriscape areas.

Parking Lots

Although the parking lot is a difficult environment for trees, successful planting in parking lots can be achieved through proper species selection, site design, soil consideration and proper maintenance. In addition to the General Recommendations above, the following recommendations pertain specifically to tree plantings in parking lots:

Species Selection

- Choose trees that do not have sharp spines or thorns and do not drop an excessive amount of fruit, limbs, or leaves.
- Plant moderate to fast growing trees to realize shading benefits as soon as possible. Trees in parking lots may have short life spans.
- Select species appropriate for parking lots per the SNRPC Regional Plant List. These species will tolerate reflected heat and limited soil space.
- Plant trees with a large canopy. The use of trees with small canopy is highly discouraged.
- Do not use palm trees in the interior of the parking lots, as they provide minimal shade. If palm trees are desired, use them as only as accent trees in groups near parking lot entrances.

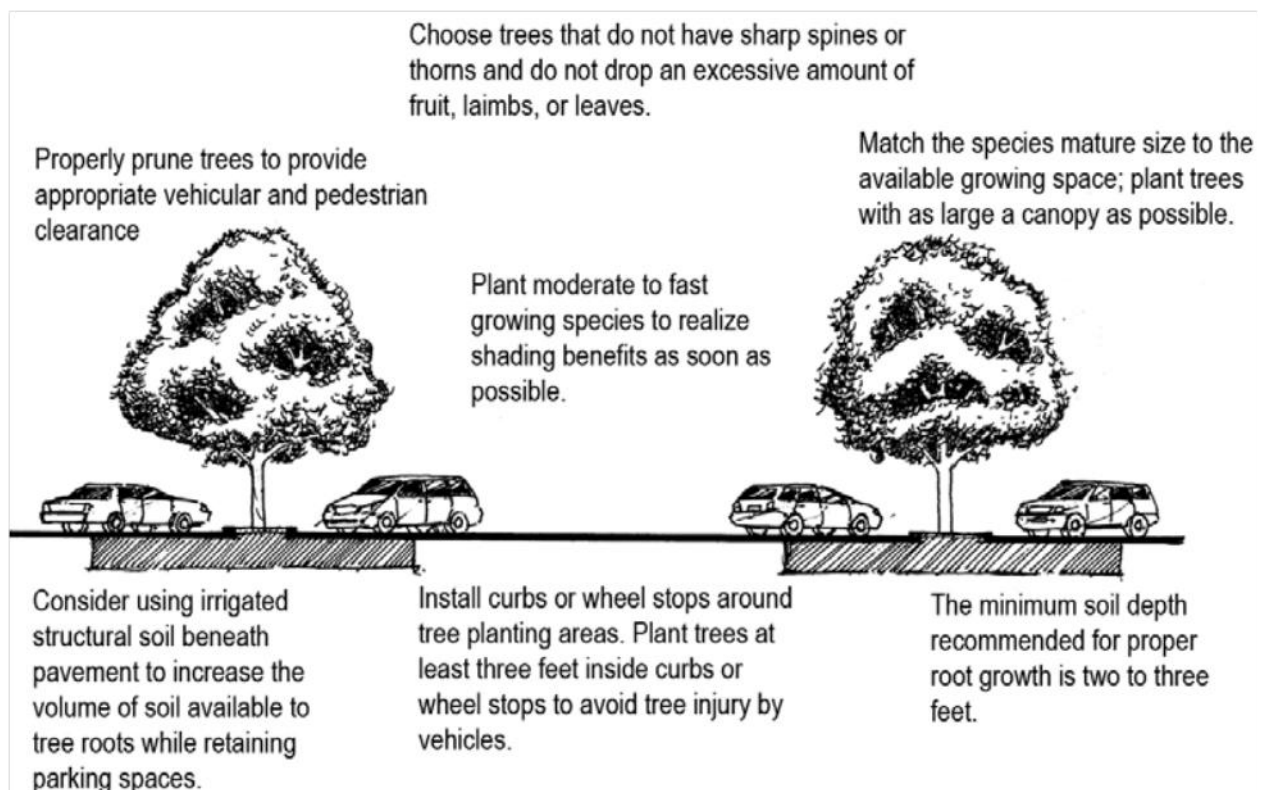
Soil Considerations

- The minimum planting island width to allow space within the critical root zone (CRZ) is six feet.
- Planting diamonds are not preferred, but if they are used, the minimum interior dimension of planting diamonds shall be six feet.
- Avoid planting trees in confined areas, such as small planting diamonds, because they don't provide enough soil volume for healthy and sustainable tree growth.
- Consider planting trees in linear planting strips combined with an enlarged planting area on the end. This allows trees to share rooting space and allows trees to grow healthier, larger, and longer than in individual planting islands.
- Consider using *structural soil* beneath the pavement around trees to increase the volume of soil available to tree roots while retaining parking spaces. See Table 1 for minimum soil volume.
- Consider using *pervious concrete* or pavers in combination with *structural soil* (see **Table 1** above for minimum soil volume). *Pervious concrete* and pavers accommodate pedestrians and vehicles, allow for increased moisture flow to tree roots, and allow for gas exchange between the roots and soil surface.

Design Considerations

- Use a combination of planting islands, *pervious concrete*, and *structural soil* beneath pavement to create more sustainable growing spaces for trees in parking lots.

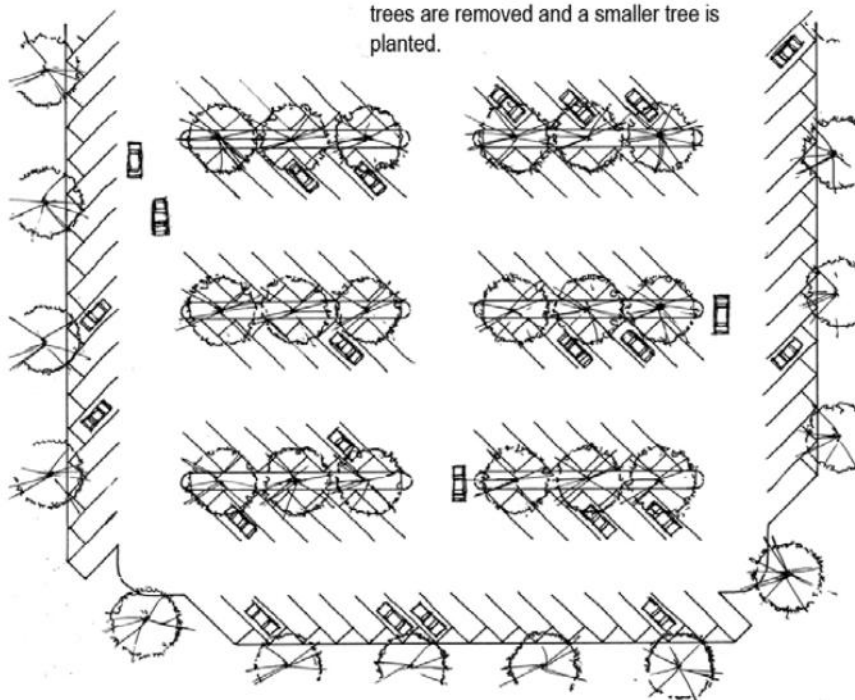
- Plant trees around the perimeter and throughout parking lots to provide even distribution of shade.
- Plant one large canopy tree for every six parking spaces, one medium canopy tree for every four parking spaces, or one small canopy tree for every two parking spaces. The use of small canopy trees in parking lots is highly discouraged.
- Increase the ratio of compact to full-sized spaces, and use one-way aisles, angled parking spaces, and shared parking to allow for additional tree planting areas.
- Reduce conflicts between trees, light poles, power lines, and signage by coordinating their location.
 - Keep parking lot light poles, area light poles and street light poles separated by a minimum of 10 feet from trees.
 - Consider signage viewshed when specifying tree planting locations.
 - Consider amending sign ordinances to promote monument signs (eye-level signs located near the street)
 - Promote site designs that locate businesses closer to the street and move parking behind the buildings to improve tenant presence, visibility and accessibility to passing motorists and pedestrians.
- Install curbs or wheel stops around tree planting areas. Plant trees at least three feet inside curbs or wheel stops to avoid tree injury by vehicles.
- Provide bicycle parking racks to reduce the practice of locking bikes to tree trunks.
- Consider installing uncurbed tree planting islands in the form of swales or linear shallow depressions which serve to filter and absorb stormwater runoff.



Plant trees around the perimeter and throughout parking lots to provide even distribution of shade.

When planting rows of trees, include a variety of species to avoid monocultures and noticeable gaps after dead or injured trees are removed and a smaller tree is planted.

The minimum open soil surface area for each large tree is 198 ft² (6'x33').



Consider using angled parking to allow for additional tree planting areas.

The minimum planting island width to allow for proper root development is 6 feet.

Consider planting trees in continuous linear planting strips. This allows trees to share rooting space and allows trees to grow healthier, larger, and longer than in individual planting islands.

Plant one large canopy tree for every six parking spaces, one medium canopy tree for every four spaces or one small canopy tree for every two spaces.

Illustration: Parking Lot Planting Recommendations

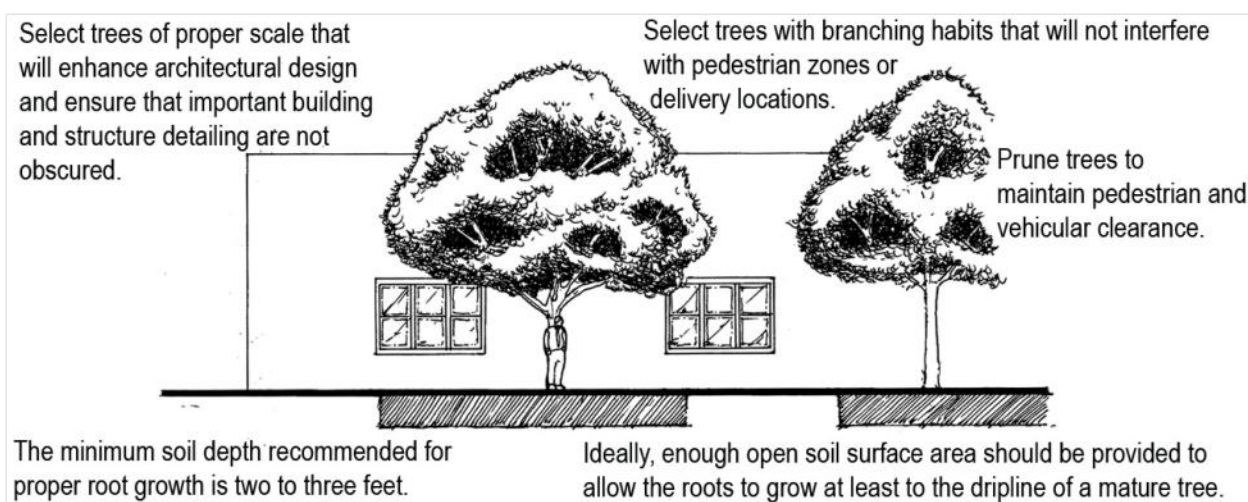
Public Facilities and Commercial Areas

Public facilities and commercial areas include schools, police stations, fire stations, libraries, plazas, downtown settings, and retail and commercial areas.

An abundance of pavement, poor quality and inadequate soil volume, close proximity to buildings and streets, air pollution, and high levels of human activity are characteristic of these areas. These characteristics create challenging conditions for tree survival and management.

Species Selection

- Choose trees that do not drop an excessive amount of fruit, limbs, or leaves.
- Select trees with branching habits that will not interfere with pedestrian zones or tall vehicle access areas.
- Match the species mature size to the available growing space, and recognize that trees do not necessarily grow uniformly in size and shape.
- Select trees of proper scale that will enhance architectural design and ensure that important building and structure detailing are not obstructed.
- Select the appropriate species for the site conditions. Soil and temperature conditions dramatically change from one area to another due to microclimatic conditions created by surrounding buildings and exposure.
- Do not plant low-water use species in turf areas.
- Do not plant low water use species with high water use species. Create hydrozones based on plant water needs.

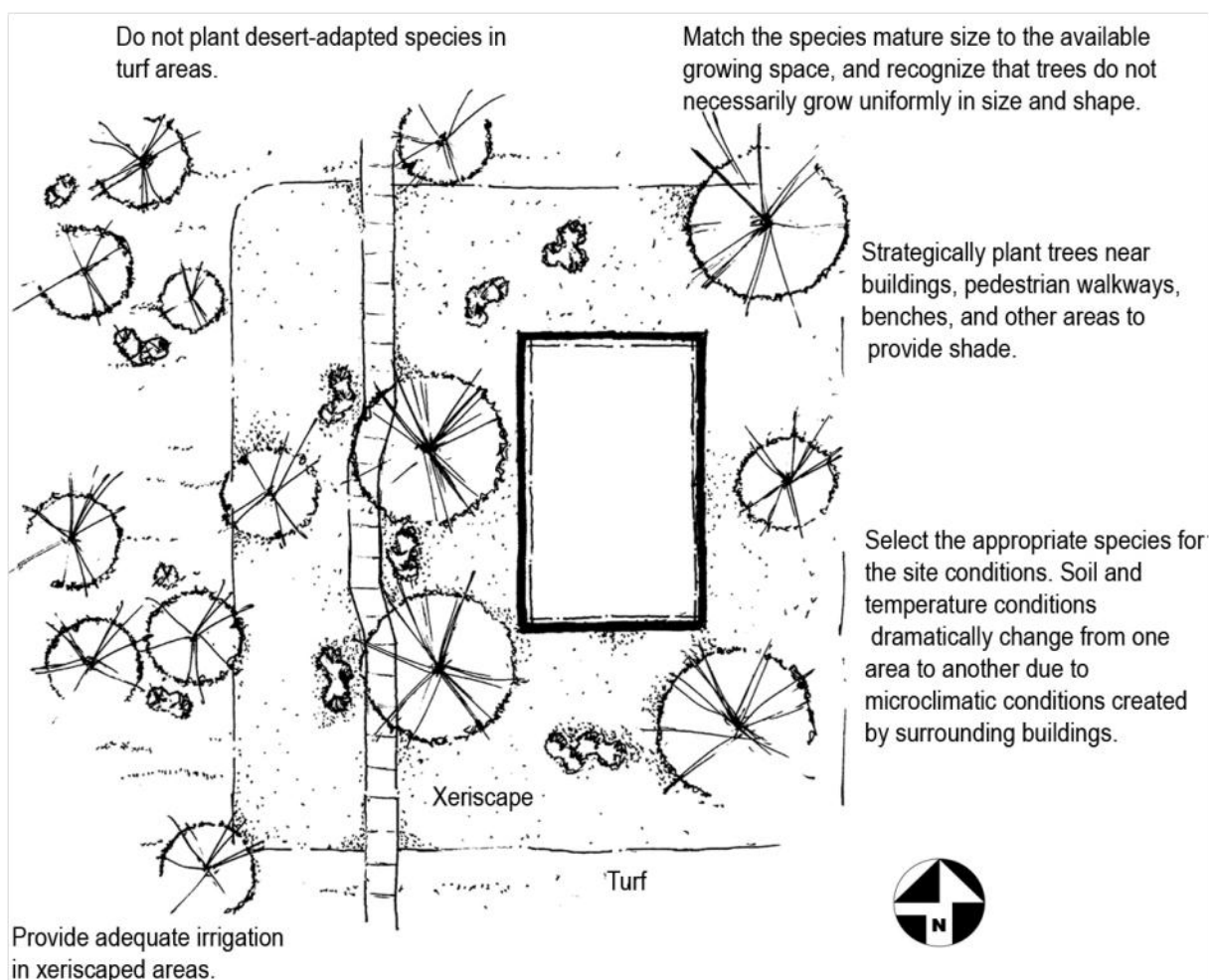


Soil Considerations

See Soil Considerations under General Recommendations on Page 4 above.

Design Considerations

- Strategically plant trees near buildings, pedestrian walkways, benches, and other areas to provide shade. Evergreen trees planted on the north side of buildings block prevailing winter winds and deciduous trees planted on the south and west sides of buildings provide shade during summer months and allow warming in winter months.
- Reduce conflicts between trees, lighting, power lines, and signage by coordinating location of trees, light poles, and signs.
 - Keep parking lot light poles, area light poles and street light poles separated by a minimum of 10 feet from trees.
 - Consider signage viewshed when specifying tree planting locations.
 - Consider amending sign ordinances to promote monument signs (eye-level signs located near the street)
 - Promote site designs that locate businesses closer to the street and move parking behind the buildings to improve tenant presence, visibility and accessibility to passing motorists and pedestrians.
- Provide bicycle parking racks to reduce the practice of locking bikes to tree trunks.



Large Landscaped Areas and Open Space

Open space areas include parks, golf courses, large landscaped areas around institutions, office and industrial parks, and rural areas. Trees occur individually and in small groups within large landscaped areas, and usually have abundant growing space for their trunk, crown, and roots.

While some large landscaped areas and the trees within them are intensively managed, such as on a golf course, others in open space and natural areas are relatively unmaintained.

Species Selection

- Plant a variety of species in mixed groups as well as individually where appropriate.
- Select trees for their suitability to the differing topography, soils, winds and vegetation that exist on the same site.
- Use desert-adapted species to create natural areas.
- Do not plant desert-adapted species in turf areas.

Soil Considerations

- Prevent soil compaction by keeping vehicles out of the dripline and beyond. Restore aeration to compacted areas by vertical mulching.

Design Considerations

- Create tree islands with understory plants to enhance wildlife habitats or to prevent pedestrian foot traffic in unwanted areas.
- Plant trees strategically around trails, playgrounds, and sporting fields to provide shade. Also shade passive recreation sites such as picnic areas and benches.

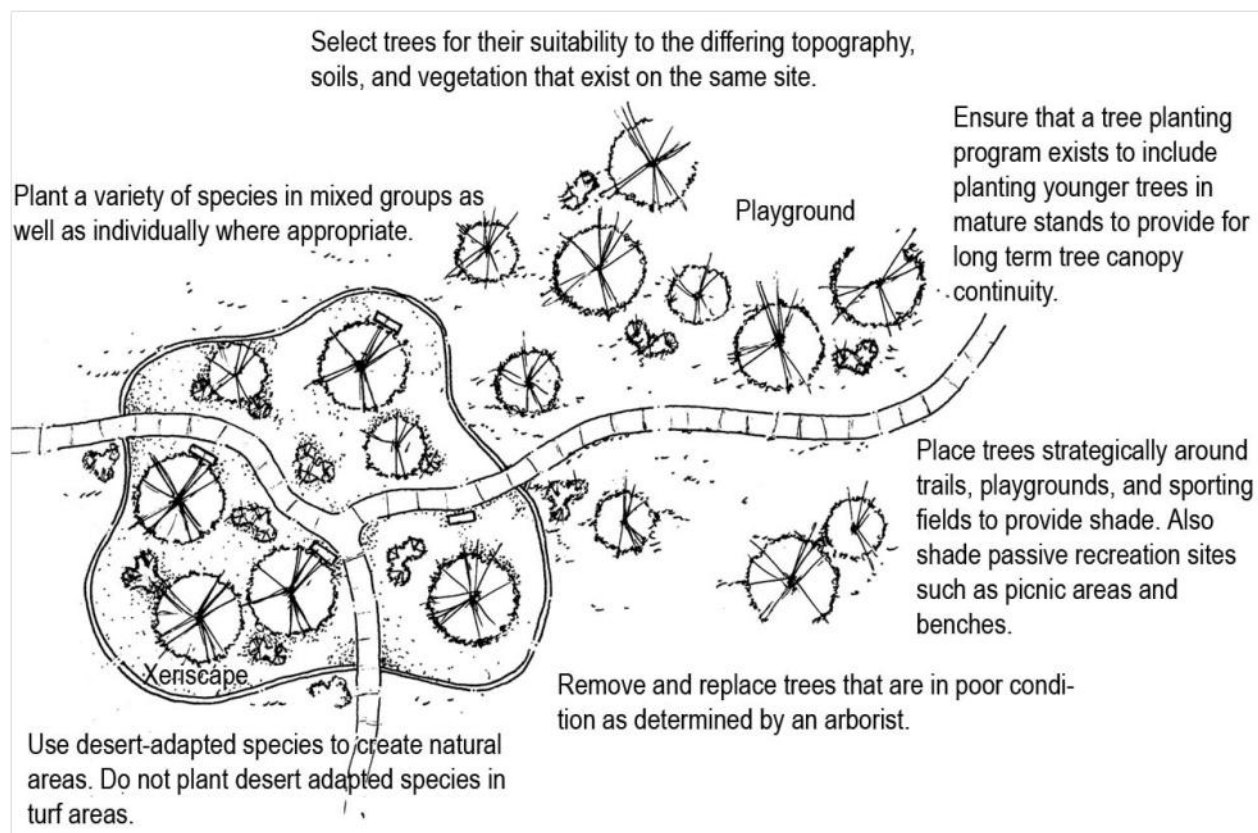


Illustration: Open Space Planting Recommendations

Transportation Corridors

The planting areas for trees in transportation corridors include road frontage areas along streets, roads, and highways. They are made up of the public road right-of-ways (including medians) and the adjacent property behind them. They can include residential front yards and commercial, institutional, and industrial frontages.

Frontage areas include both street trees and yard trees that are part of a property's landscape design and function. Street trees are found growing both individually and in groups.

Species Selection

- Consider mature canopy width and planting distance from the right-of-way to ensure adequate clearance for vehicles.
- Plant a variety of species throughout a neighborhood to discourage a monoculture, but promote visual continuity by restricting the number of species along any individual street.

Soil Considerations

- Provide detached sidewalks with a minimum planting area of 6 feet between back of curb and sidewalk.
- Plant trees behind the sidewalk on adjacent private property and tree planting easements to increase growing space.
- Streetscapes and planting medians should be a minimum of 6 feet wide to allow for proper root development.

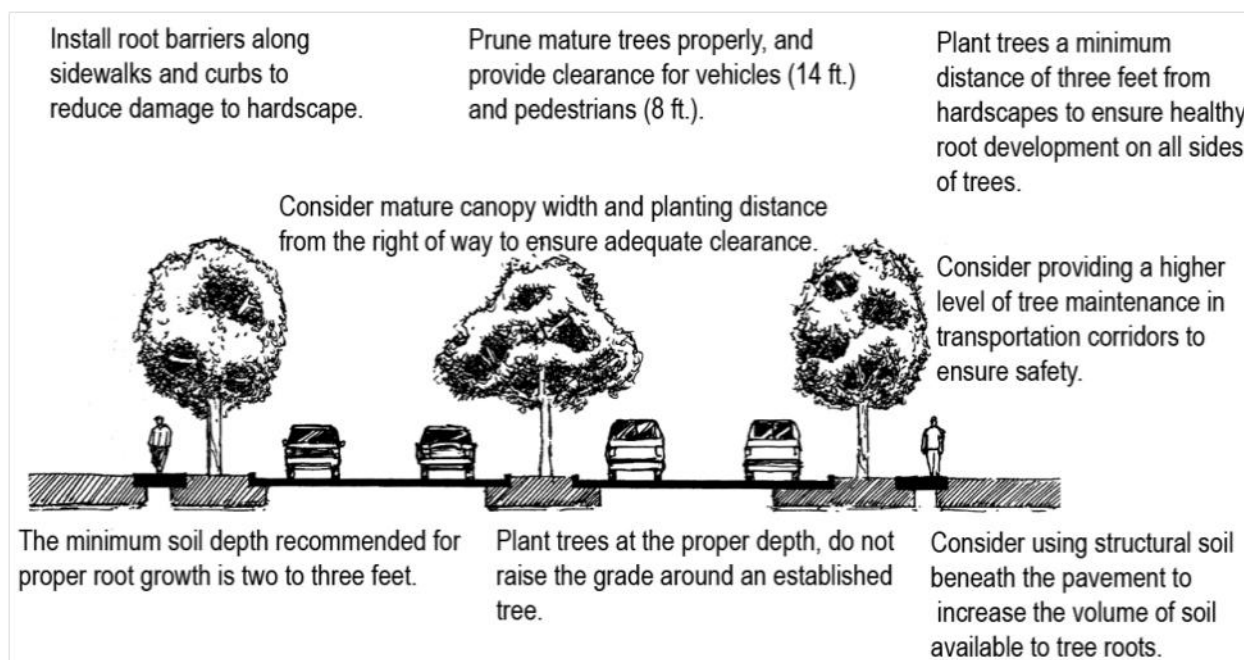


Illustration: Street Tree Planting Cross-section

Design Considerations

- Plant low-maintenance trees in center medians and irrigate appropriately.
- Vary the spacing between trees to add interest and diversity to roadway plantings while ensuring that spacing between trees is adequate to support healthy mature canopies.
- Plant large groups of trees to provide visual relief. Scale and massing should be appropriate for speed limit of roadway.
- Minimize ownership concerns by planting trees at least three feet away from property lines and providing root barriers where there are curbs and sidewalks.
- Plant trees a minimum distance of three feet from hardscapes to ensure healthy root development on all sides of trees.
- To ensure adequate visual sight lines for motorists, follow the local jurisdiction's requirements for sight visibility easements and do not plant trees within those easements.
- The lowest branches of the street tree canopies should be at a minimum height of 9 feet when practicable depending on the species and kept trimmed so as to not conflict with the drivers' line of sight.
- Trunk and canopy sizes at maturity should be part of the design considerations for street tree planting.
- Install root barriers along sidewalks and curbs to reduce damage to hardscape.
- Consider recycled rubber sidewalks when trees and sidewalks are in close proximity to prevent infrastructure damage by tree roots.
- Consider using pervious concrete or pavers, in combination with structural soils, for sidewalks when in close proximity to trees.

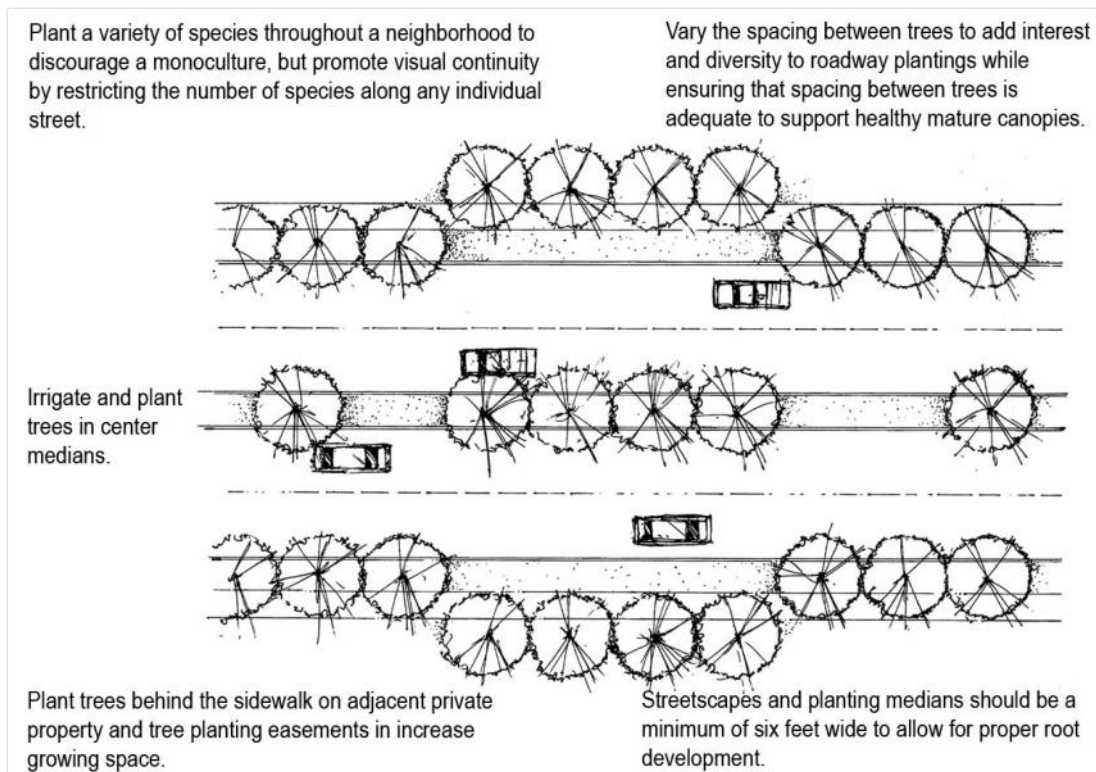


Illustration: Street Tree Planting

Utility Corridors

Utility corridors are linear landscapes that can contain power, gas, water, sewer, or phone services. These corridors range from 20 feet to 150 feet wide, often parallel roadways, and contain aboveground and/or underground lines. Vegetation must be controlled within the corridors to allow safe maintenance and repair of the utility lines.

Safety Requirements

- Contact the local electric power utility before work begins, if working within 10 feet of overhead or underground high voltage powerlines. Required by law (Nevada Revised Statutes (NRS) 455.200-250).
- Use only qualified line-clearance arborists (OSHA 29 CFR Part 1910 and ANSI Z133.1-2006 or current) to work within 10 feet of distribution voltages (750 volts-50 kV) and 15-27 feet from transmission voltages (69-500 kV).

Species Selection

- Plant only small trees within 15 feet of overhead electrical power lines to ensure line clearance can be maintained.
- Plant medium-sized trees at least 20 feet from overhead electrical distribution lines.
- Plant large-sized trees at least 30 feet from overhead electrical distribution lines.

Soil Considerations

- Prevent soil compaction by keeping vehicles out of the dripline. Restore aeration to compacted areas by vertical mulching.

Design Considerations

- Plant all trees at least 10 feet from sewer lines, 15 feet from underground electrical power distribution lines, and 20 feet from underground electrical or gas transmission lines.
- The placement of trees should not impede access for maintenance vehicles and equipment.
- Consider establishing trails within utility corridors. Trees planted along these trails provide shade for users and increase their level of usage.
- Trees with aggressive root systems require installation of a root barrier system.

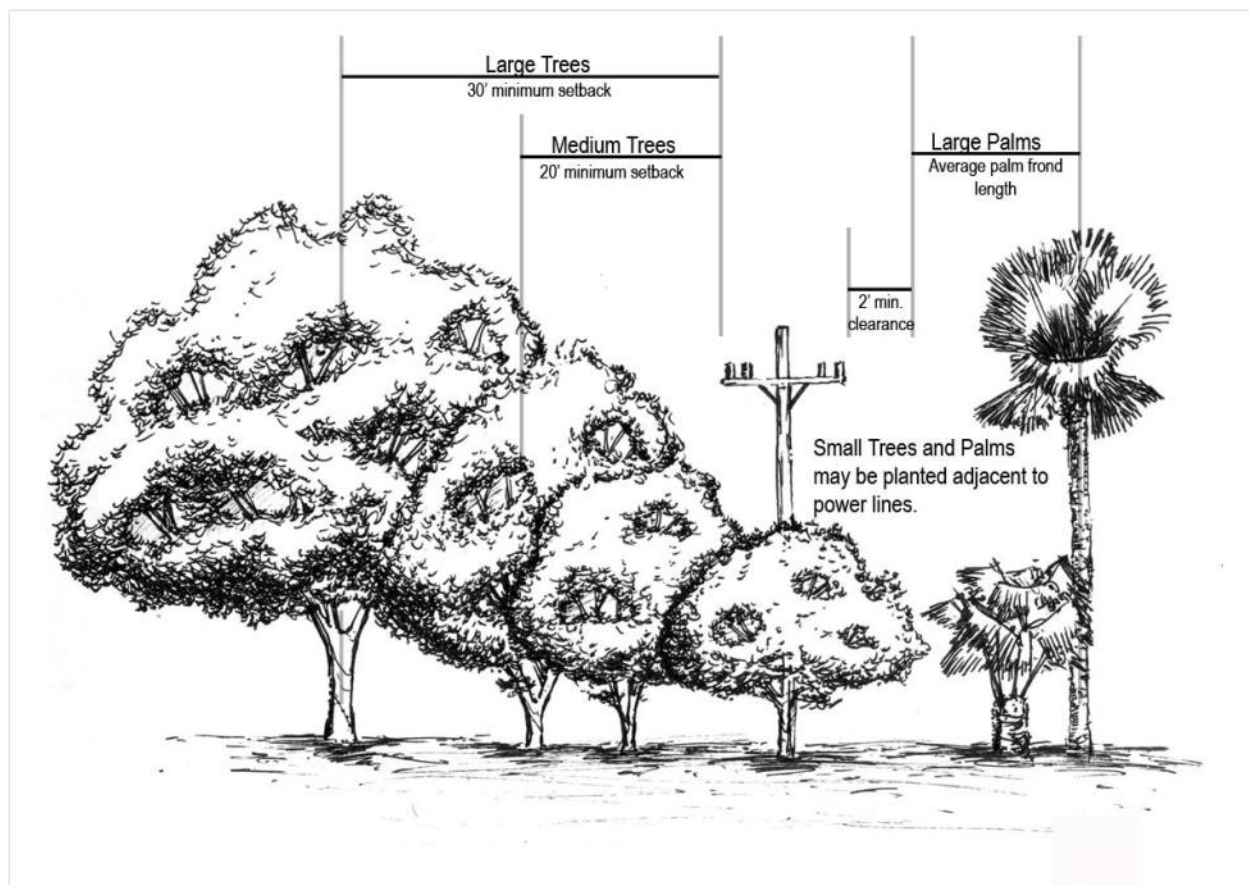


Illustration: Separation from overhead utilities.

Definitions

Biogenic volatile organic compound (BVOC)

Hydrocarbon compounds released into the air by vegetation that contribute to the formation of smog and may be toxic by themselves.

Pervious concrete or paving

Hardscape materials that allow for water and gases to pass through into the soil. Examples include bricks and pavers that do not have mortar between them.

Root barriers

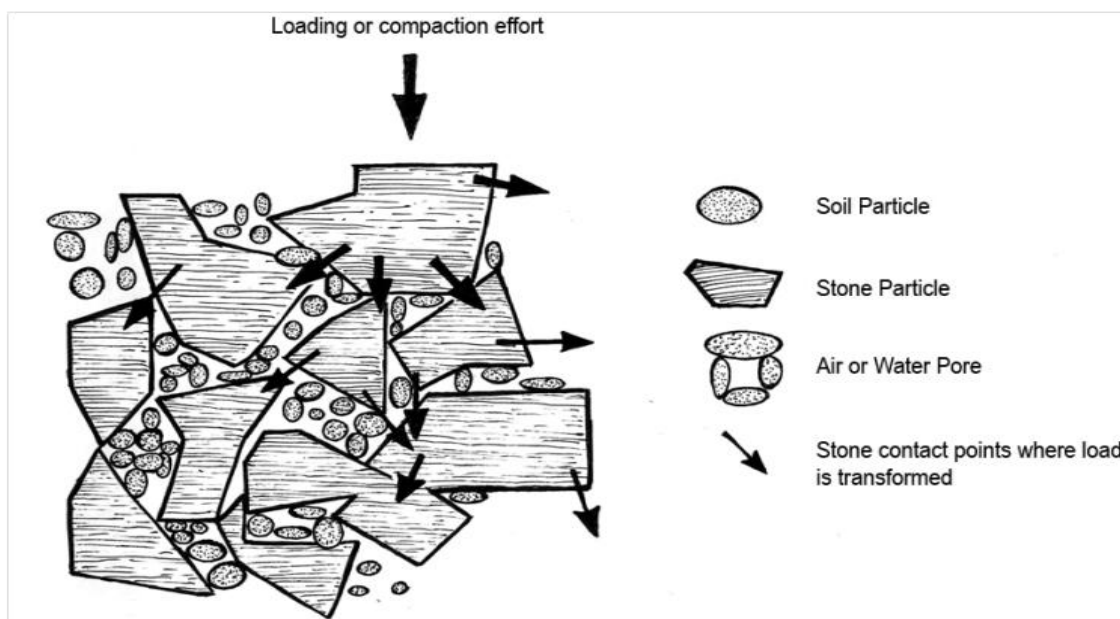
Devices made of fabric, plastic or metal that are installed in the ground to direct roots away from areas to be protected.

Soil Volume

The amount of soil needed for the roots of a tree to grow and expand in a way that promotes optimum health for the tree. The general recommendation based on the tree species size is for one to two cubic feet of soil per square foot of tree canopy area. The formula used in Table 1 is based on 1 cubic foot of soil per square foot of tree canopy area at a depth of 3 feet. The soil volume provided may be covered with hardscape. In those cases, permeable paving materials are highly recommended as is structural soil.

Structural Soil

A two-part mix of rocks and soil which acts as both a load-bearing medium (the rocks) and a growing medium (the soil). Angular chunks of crushed rock provide structure while leaving gaps that are filled by soil, allowing for root penetration. Typically used under hardscape areas near trees. For additional information, go to <http://www.hort.cornell.edu/uhi/outreach/pdfs/custructuralsoilwebpdf.pdf>.

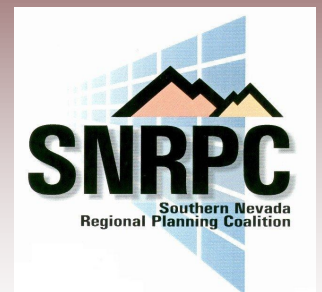




Southern Nevada Regional Planning Coalition
Regional Fruit and Vegetable Plant List



Approved
January 28, 2014



Acknowledgements

This Regional Fruit and Vegetable Plant List has been assembled by the City of Las Vegas Department of Planning at the direction of Policy FP 1.2.2 of the City of Las Vegas Food Access Policy Guide. Several agencies and individuals played a vital role in the review and provision of information contained within this guide, including the Southern Nevada Regional Planning Coalition's (SNRPC) Regional Urban Forestry Work Group and the University of Nevada Cooperative Extension. Special thanks go to the following individuals for their contributions:

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On the cover: City of Las Vegas Mayor Carolyn G. Goodman, Councilwoman Lois Tarkanian and Councilman Steve Ross attend the grand opening of the Provident Community Garden, 6000 West Oakey Boulevard.

Introduction

The intent of this list is to provide a single, region-wide reference for homeowners and community gardeners to select appropriate plants when planning out their gardens in the Las Vegas area. This list is not intended for commercial crop or food production, as the local soil conditions and water usage of many of these plants hinder large-scale commercial viability.

Best Practices

Gardening in raised beds is a common practice here in Southern Nevada, as native soils contain high salt levels and low amounts of organic matter. Many times gardeners will find that raised beds are easier to create and maintain than to dig in and amend native alkaline soils. Utilizing a layer of organic mulch is strongly recommended in fruit and vegetable gardening to control soil temperatures, conserve water usage and regulate weeds.

Variety Selection

Given the complex climate challenges of Southern Nevada, certain varieties of fruits and vegetables work better than others. When particular varieties of fruit or vegetables are specified, it is because they have been proven to be better, more reliable selections for our region. While other varieties of fruits or vegetables not shown on this list may be available at retail locations, careful research should be conducted to ensure that the chosen plant variety will perform satisfactory in our climate and produce reliable edibles.

KEY Height, Width and Coverage are at mature growth. Food Type: <u>B</u> erry, <u>F</u> ruit, <u>H</u> erb, <u>N</u> ut, <u>V</u> egetable, <u>O</u> ther Type: <u>D</u> eciduous, <u>E</u> vergreen, <u>S</u> emi-evergreen Growth Rate: <u>S</u> low, <u>M</u> edium, <u>F</u> ast Water Use: <u>V</u> ery Low, <u>L</u> ow, <u>M</u> edium, <u>H</u> igh Drought Tolerance: <u>L</u> ow, <u>M</u> edium, <u>H</u> igh Plant Form: <u>T</u> ree, <u>S</u> hrub, <u>V</u> ine Exposure: <u>F</u> ull sun, <u>P</u> artial shade, <u>S</u> hade		Height (average)	Width (average)	Coverage	Food Type	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Hedge or Screen	Plant Form	Okay Under Overhead Utility Lines	Exposure	Harvest Dates, (Notes)
BOTANICAL NAME	COMMON NAME (In Alphabetical Order)	(feet)	(feet)	(sq. feet)	B, F, H, N, V, O	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	T, S, V	Yes or No	F, P, S	
Fruits & Vegetables															
<i>Prunus dulcis</i>	Almond	25	20	236	N	D	S	M	M	N	N	T	N	F	
<i>Prunus amygdalus</i> 'All in One'	Almond, All in One	15	10	59	N	D	S	M	M	N	N	T	Y	F	Late Sept-Oct
<i>Prunus amygdalus</i> 'Garden Prince'	Almond, Garden Prince	10	8	50	N	D	S	M	M	N	N	T	Y	F	Late Sept-Oct
<i>Prunus amygdalus</i> 'Nonpareil'	Almond, Nonpareil	15	10	59	N	D	S	M	M	N	N	T	Y	F	
<i>Malus x domestica</i> 'Anna'	Apple, Anna	15	15	133	F	D	M	H	L	N	N	T	Y	F	June-July
<i>Malus x domestica</i> 'Dorset Golden'	Apple, Dorset Golden	15	15	133	F	D	M	H	L	N	N	T	Y	F	June-July
<i>Malus x domestica</i> 'Ein Shemer'	Apple, Ein Shemer	15	12	85	F	D	M	H	L	N	N	T	Y	F	June-July
<i>Malus x domestica</i> 'Fuji'	Apple, Fuji	15	15	133	F	D	M	H	L	N	N	T	Y	F	Sept-October
<i>Malus x domestica</i> 'Gala'	Apple, Gala	15	12	85	F	D	M	H	L	N	N	T	Y	F	August
<i>Malus x domestica</i> 'Gordon'	Apple, Gordon	15	12	85	F	D	M	H	L	N	N	T	Y	F	Aug-Sept
<i>Malus x domestica</i> 'Granny Smith'	Apple, Granny Smith	15	12	85	F	D	M	H	L	N	N	T	Y	F	Oct - Nov
<i>Malus x domestica</i> 'Mutsu'	Apple, Mutsu (Crispin)	15	12	85	F	D	M	H	L	N	N	T	Y	F	Sept-October
<i>Malus x domestica</i> 'Pink Lady'	Apple, Pink Lady (Cripps Pink)	15	15	133	F	D	M	H	L	N	N	T	Y	F	Oct - Nov
<i>Malus x domestica</i> 'White Winter Pearmain'	Apple, White Winter Pearmain	15	12	85	F	D	M	H	L	N	N	T	Y	F	Sept-October
<i>Malus x domestica</i> 'Yellow Newton Pippin'	Apple, Yellow Newton Pippin	15	12	85	F	D	M	H	L	N	N	T	Y	F	Oct - Nov
<i>Prunus armeniaca</i> 'Blenheim'	Apricot, Blenheim (Royal)	15	15	133	F	D	M	H	L	N	N	T	Y	F	June-July
<i>Prunus armeniaca</i> 'Canadian White Blenheim'	Apricot, Canadian White Blenheim	15	15	133	F	D	M	H	L	N	N	T	Y	F	July-August
<i>Prunus armeniaca</i> 'Chinese'	Apricot, Chinese	15	15	133	F	D	M	H	L	N	N	T	Y	F	June
<i>Prunus armeniaca</i> 'Early Golden'	Apricot, Early Golden	15	15	133	F	D	M	H	L	N	N	T	Y	F	May-June
<i>Prunus armeniaca</i> 'Flora Gold'	Apricot, Flora Gold	15	10	59	F	D	M	H	L	N	N	T	Y	F	June
<i>Prunus</i> 'Gold Kist'	Apricot, Gold Kist	15	15	133	F	D	M	H	L	N	N	T	Y	F	June
<i>Prunus armeniaca</i> 'Katy'	Apricot, Katy	15	15	133	F	D	M	H	L	N	N	T	Y	F	May-June
<i>Prunus armeniaca</i> 'Moorpark'	Apricot, Moorpark	15	15	133	F	D	M	H	L	N	N	T	Y	F	July
<i>Prunus armeniaca</i> 'Royal Rosa'	Apricot, Royal Rosa	15	15	133	F	D	M	H	L	N	N	T	Y	F	May-June
<i>Prunus persica</i> 'Snow Queen'	Apricot, Snow Queen	12	10	59	F	D	F	H	L	N	N	T	Y	F	June
<i>Prunus</i> 'Flavor Delight'	Aprium, Flavor Delight	15	15	133	F	D	M	H	L	N	N	T	Y	F	May-June
<i>Cynara scolymus</i>	Artichoke	4	6	n/a	V	n/a	M	H	L	N	N	S, V	Y	P	Spring
<i>Eruca vesicaria</i>	Arugula	1	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F	
<i>Brassica</i> sp.	Asian Greens	1	1	n/a	V	n/a	F	H	L	N	N	S	Y	P	
<i>Asparagus officinalis</i>	Asparagus	.5	n/a	n/a	V	n/a	M	H	L	N	N	S	Y	F	Early Spring
<i>Ocimum basilicum</i>	Basil	1	1	n/a	H	n/a	F	H	L	N	N	S	Y	F	
<i>Phaseolus vulgaris</i>	Beans, Snap	2	n/a	n/a	V	n/a	F	H	L	N	N	S, V	Y	F	(Amended soil)
<i>Beta Vulgaris</i>	Beet	1	1	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Rubus fruticosus</i> 'Rosborough'	Blackberry, Rosborough	6	1	n/a	B	D	M	H	L	Y	N	S, V	Y	P	July-August
<i>Rubus fruticosus</i> 'Womack'	Blackberry, 'Womack'	4	1	n/a	B	D	M	H	L	Y	N	S, V	Y	P	July-August
<i>Brassica ruvo</i>	Broccoli	2	2	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Brassica oleracea</i>	Brussels Sprouts	2	1.5	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Brassica rapasp.</i>	Cabbage/Kale	1	2	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Brassica pekinensis</i>	Cabbage, Chinese	1	1	n/a	V	n/a	M	H	L	N	N	S	Y	F	
<i>Daucus carota</i>	Carrot	1	0.5	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Brassica</i> sp.	Cauliflower	2	2.5	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Apium graveolens</i> sp.	Celery	1	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F	(Very high water)
<i>Apium graveolens</i> sp.	Celery Root	1	1	n/a	O	n/a	M	H	L	N	N	S	Y	F	(Very high water)
<i>Coriandrum sativum</i>	Cilantro	1	1	n/a	H	n/a	M	H	L	N	N	S	Y	F	
<i>Cucurbit sativus</i>	Cucumber	4	1	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Anethum graveolens</i>	Dill	3	1.5	n/a	H	n/a	M	H	L	N	N	S	Y	F	
<i>Solanum melongena</i>	Eggplant	2	3	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Cichorium endivia</i>	Endive	1	1	n/a	V	n/a	M	H	L	N	N	S	Y	F, P	
<i>Ficus carica</i>	Fig	20	20	236	F	D	M	M, H	L, M	N	N	T	N	F	
<i>Ficus carica</i> 'Black Mission'	Fig, Black Mission	25	25	368	F	D	F	M, H	L, M	N	N	T	N	F	August-Nov
<i>Ficus carica</i> 'Janice'	Fig, Janice	25	25	368	F	D	F	M, H	L, M	N	N	T	N	F	August-Nov
<i>Ficus carica</i> 'Kadota'	Fig, Kadota	25	25	368	F	D	F	M, H	L, M	N	N	T	N	F	August-Nov
<i>Allium ursinum</i>	Garlic	1	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F	
<i>Allium tuberosum</i>	Garlic Chives	1	.5	n/a	H	n/a	F	H	L	N	N	S	Y	F	
<i>Vitis</i> sp.	Grape	10	10	59	F	D	M	L	M	N	Y	V	Y	F, P	
<i>Vitis</i> 'Blush'	Grape, Blush	10	10	59	F	D	M	L	M	N	Y	V	Y	F, P	
<i>Vitis</i> 'Black Monukka Seedless'	Grape, Black Monukka Seedless	10	10	59	F	D	M	L	M	N	Y	V	Y	F, P	
<i>Vitis</i> 'Fantasy'	Grape, Fantasy Seedless	10	10	59	F	D	F	L	M	N	Y	V	Y	F, P	
<i>Vitis</i> 'Flame'	Grape, Flame Seedless	10	10	59	F	D	F	L	M	N	Y	V	Y	F, P	
<i>Vitis</i> 'Harmony'	Grape, Harmony	10	10	59	F	D	M	L	M	N	Y	V	Y	F, P	
<i>Vitis</i> 'Himrod'	Grape, Himrod Seedless	10	10	59	F	D	M	L	M	N	Y	V	Y	F, P	

KEY Height, Width and Coverage are at mature growth. Food Type: <u>B</u> erry, <u>F</u> ruit, <u>H</u> erb, <u>N</u> ut, <u>V</u> egetable, <u>O</u> ther Type: <u>D</u> eciduous, <u>E</u> vergreen, <u>S</u> emi-evergreen Growth Rate: <u>S</u> low, <u>M</u> edium, <u>F</u> ast Water Use: <u>V</u> ery Low, <u>L</u> ow, <u>M</u> edium, <u>H</u> igh Drought Tolerance: <u>L</u> ow, <u>M</u> edium, <u>H</u> igh Plant Form: <u>T</u> ree, <u>S</u> hrub, <u>V</u> ine Exposure: <u>F</u> ull sun, <u>P</u> artial shade, <u>S</u> hade		Height (average)	Width (average)	Coverage	Food Type	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Hedge or Screen	Plant Form	Okay Under Overhead Utility Lines	Exposure	Harvest Dates, (Notes)
BOTANICAL NAME	COMMON NAME (In Alphabetical Order)	(feet)	(feet)	(sq. feet)	B, F, H, N, V, O	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	T, S, V	Yes or No	F, P, S	
Fruites & Vegetables (continued)															
<i>Vitis</i> 'Perlette'	Grape, Perlette Seedless	10	10	59	F	D	M	L	M	N	Y	V	Y	F,P	
<i>Vitis</i> 'Primitivo'	Grape, Primitivo	10	10	59	F	D	M	L	M	N	Y	V	Y	F,P	
<i>Vitis</i> 'Summer Muscat'	Grape, Summer Muscat	10	10	59	F	D	M	L	M	N	Y	V	Y	F,P	
<i>Vitis</i> 'Thompson Seedless'	Grape, Thompson Seedless	10	10	59	F	D	M	L	M	N	Y	V	Y	F,P	
<i>Vitis</i> 'Zinfandel'	Grape, Zinfandel	10	10	59	F	D	M	L	M	N	Y	V	Y	F,P	
<i>Armoracia rusticana</i>	Horseradish	2	3	n/a	O	E	M	H	L	N	N	S	Y	F	(Invasive)
<i>Ziziphus jujuba</i>	Jujube, Chinese Date	25	20	236	F	D	S	M	M	N	Y	T	N	F	
<i>Brassica oleracea</i>	Kale and Collards	1.5	1.5	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Brassica oleracea</i> var. <i>gongylodes</i>	Kohlrabi	1	.5	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Laurus nobilis</i>	Laurel, Bay	12	12	85	H	E	M,F	M	M	N	Y	S	Y	F	
<i>Allium porrum</i>	Leek	2	.5	n/a	V	n/a	F	H	L	N	N	S	Y	F,P	
<i>Cymbopogon citratus</i>	Lemon Grass	4	3	n/a	H	n/a	F	H	L	N	N	S	Y	F	
<i>Lactuca sativa</i>	Lettuce	.5	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F,P	
<i>Valerianella locusta</i>	Mache	.5	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F	
<i>Cucumis melo</i>	Melon, Cantaloupe, Honeydew	1	10	n/a	F	n/a	M	H	L	N	N	V	Y	F	
<i>Cucumis melo</i>	Muskmelon	1	10	n/a	F	n/a	F	H	L	N	N	V	Y	F	
<i>Brassica juncea</i>	Mustard	1	.5	n/a	H	n/a	F	H	L	N	N	S	Y	F	
<i>Prunus persica</i> 'Artic Glo'	Nectarine, Artic Glo	12	10	59	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Artic Rose'	Nectarine, Artic Rose	12	10	59	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Artic Star'	Nectarine, Artic Star	12	10	59	F	D	F	H	L	N	N	T	Y	F	June
<i>Prunus persica</i> 'Desert Dawn'	Nectarine, Desert Dawn	12	10	59	F	D	F	H	L	N	N	T	Y	F	May
<i>Prunus persica</i> 'Desert Delight'	Nectarine, Desert Delight	12	10	59	F	D	F	H	L	N	N	T	Y	F	June
<i>Prunus persica</i> 'Double Delight'	Nectarine, Double Delight	12	10	59	F	D	F	H	L	N	N	T	Y	F	July
<i>Prunus persica</i> 'Goldmine'	Nectarine, Goldmine	12	10	59	F	D	F	H	L	N	N	T	Y	F	August
<i>Prunus persica</i> 'Liz's Late'	Nectarine, Liz's Late	12	10	59	F	D	F	H	L	N	N	T	Y	F	Aug-Sept
<i>Prunus persica</i> 'Panamint'	Nectarine, Panamint	12	10	59	F	D	F	H	L	N	N	T	Y	F	July-Aug
<i>Abelmoschus esculentus</i>	Okra	6	2	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Allium cepa</i>	Onion	.5	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F,P	
<i>Petroselinum crispum</i>	Parsley	1	1	n/a	H	n/a	F	H	L	N	N	S	Y	F,P	
<i>Pastinaca sativa</i>	Parsnip	1	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F	
<i>Pisum sativum</i>	Pea	6	.5	n/a	V	n/a	F	H	L	N	N	V	Y	F	
<i>Prunus persica</i>	Peach, Nectarine	12	10	59	F	D	F	H	L	N	N	T	Y	F	
<i>Prunus persica</i> 'Artic Supreme'	Peach, Artic Supreme	12	10	59	F	D	F	H	L	N	N	T	Y	F	July-Aug
<i>Prunus persica</i> 'Babcock'	Peach, Babcock White	12	10	59	F	D	F	H	L	N	N	T	Y	F	July
<i>Prunus persica</i> 'Bonanza'	Peach, Bonanza Miniature	12	10	59	F	D	F	H	L	N	N	T	Y	F	June
<i>Prunus persica</i> 'Desert Gold'	Peach, Desert Gold	12	10	59	F	D	F	H	L	N	N	T	Y	F	May-June
<i>Prunus persica</i> 'Earlitreat'	Peach, Earlitreat	12	10	59	F	D	F	H	L	N	N	T	Y	F	May
<i>Prunus persica</i> 'Early Amber'	Peach, Early Amber	12	10	59	F	D	F	H	L	N	N	T	Y	F	June
<i>Prunus persica</i> 'Early Elberta'	Peach, Early Elberta	12	10	59	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Elberta'	Peach, Elberta	12	10	59	F	D	F	H	L	N	N	T	Y	F	July-Aug
<i>Prunus persica</i> 'Eldorado'	Peach, Eldorado Miniature	4	4	13	F	D	F	H	L	N	N	S	Y	F	May-June
<i>Prunus persica</i> 'Eva's Pride'	Peach, Eva's Pride	12	10	59	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Flordaprince'	Peach, Flordaprince	12	10	59	F	D	F	H	L	N	N	T	Y	F	May-June
<i>Prunus persica</i> 'May Pride'	Peach, May Pride	12	10	59	F	D	F	H	L	N	N	T	Y	F	May-June
<i>Prunus persica</i> 'Mid Pride'	Peach, Mid Pride	12	10	59	F	D	F	H	L	N	N	T	Y	F	July
<i>Prunus persica</i> 'Pix Zee'	Peach, Pix Zee Miniature	6	5	20	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Red Baron'	Peach, Red Baron	12	10	59	F	D	F	H	L	N	N	T	Y	F	July-Aug
<i>Prunus persica</i> 'Redhaven'	Peach, Redhaven	12	10	59	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Starks Saturn'	Peach, Starks Saturn, Donut, Saucer, Peento	12	10	59	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Strawberry Free'	Peach, Strawberry Free White	12	10	59	F	D	F	H	L	N	N	T	Y	F	June-July
<i>Prunus persica</i> 'Tropic Snow'	Peach, Tropic Snow White	12	10	59	F	D	F	H	L	N	N	T	Y	F	June
<i>Arachis pypogaea</i>	Peanut	2	1	n/a	N	n/a	M	H	L	N	N	S	Y	F	
<i>Pyrus communis</i> 'Bartlett'	Pear, Bartlett	30	15	133	F	D	M	H	L	N	N	T	N	F	August
<i>Pyrus communis</i> 'Cornice'	Pear, Cornice	30	15	133	F	D	M	H	L	N	N	T	N	F	Sept-Oct
<i>Pyrus communis</i>	Pear, European	30	15	133	F	D	M	H	L	N	N	T	N	F	
<i>Pyrus communis</i> 'Hood'	Pear, Hood	30	15	133	F	D	M	H	L	N	N	T	N	F	July-Aug
<i>Pyrus communis</i> 'Kieffer'	Pear, Kieffer	30	15	133	F	D	M	H	L	N	N	T	N	F	Sept-Oct
<i>Pyrus communis</i> 'Monterrey'	Pear, Monterrey	30	15	133	F	D	M	H	L	N	N	T	N	F	Aug-Sept
<i>Pyrus communis</i> 'Red Bartlett'	Pear, Red Bartlett	30	15	133	F	D	M	H	L	N	N	T	N	F	Aug-Sept

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BOTANICAL NAME	COMMON NAME (In Alphabetical Order)	(feet)	(feet)	(sq. feet)	B, F, H, N, V, O	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	T, S, V	Yes or No	F, P, S	
Fruits & Vegetables (continued)															
<i>Pyrus pyrifolia</i> 'Shinseiki'	Pear, Shinseiki Asian	12	12	85	F	D	M	H	L	N	N	T	Y	F	July-Aug
<i>Pyrus pyrifolia</i> 'Twentieth Century'	Pear, Twentieth Century Asian	12	12	85	F	D	M	H	L	N	N	T	Y	F	August
<i>Capsicum annuum</i>	Pepper	2	1.5	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Diospyros kaki</i>	Persimmon	15	12	85	F	D	M	H	L	N	N	T	Y	F	
<i>Diospyros kaki</i> 'Fuyu'	Persimmon, Fuyu/Jiro	15	12	85	F	D	M	H	L	N	N	T	Y	F	Oct-Nov
<i>Diospyros kaki</i> 'Hachiya'	Persimmon, Hachiya	15	12	85	F	D	M	H	L	N	N	T	Y	F	Nov-Dec
<i>Pistacia vera</i>	Pistachio Nut	20	20	236	N	D	M	M	M	N	N	T	Y	F	
<i>Prunus</i> sp.	Plum	15	15	133	F	D	M	M	M	N	N	T	Y	F	
<i>Prunus salicina</i> 'Beauty'	Plum, Beauty	15	15	133	F	D	M	M	M	N	N	T	Y	F	June
<i>Prunus salicina</i> 'Burbank'	Plum, Burbank	10	10	59	F	D	M	M	M	N	N	T	Y	F	July-Aug
<i>Prunus salicina</i> 'Elephant Heart'	Plum, Elephant Heart	15	15	133	F	D	M	M	M	N	N	T	Y	F	Aug-Sept
<i>Prunus salicina</i> 'Emerald Beaut'	Plum, Emerald Beaut	15	15	133	F	D	M	M	M	N	N	T	Y	F	Aug-Oct
<i>Prunus salicina</i> 'Mariposa'	Plum, Mariposa	15	15	133	F	D	M	M	M	N	N	T	Y	F	July-Aug
<i>Prunus salicina</i> 'Santa Rosa'	Plum, Santa Rosa	15	15	133	F	D	M	M	M	N	N	T	Y	F	June-July
<i>Prunus salicina</i> 'Weeping Santa Rosa'	Plum, Weeping Santa Rosa	8	8	50	F	D	M	M	M	N	N	T	Y	F	June-July
<i>Prunus armeniaca</i> x <i>domestica</i> 'Flavor King'	Pluot® , Flavor King	12	12	85	F	D	M	M	M	N	N	T	Y	F	Aug-Sept
<i>Prunus armeniaca</i> x <i>domestica</i> 'Flavor Queen'	Pluot® , Flavor Queen	12	12	85	F	D	M	M	M	N	N	T	Y	F	July-Aug
<i>Punica</i> sp.	Pomegranate	20	15	133	F	D	M	M	M	N	N	T, S	Y	F	
<i>Punica granatum</i> 'Eversweet'	Pomegranate, Eversweet	8	8	50	F	D	M	M	M	N	N	T, S	Y	F	Summer-Fall
<i>Punica granatum</i> 'Sweet'	Pomegranate, Sweet	15	15	133	F	D	M	M	M	N	N	T	Y	F	Late Summer
<i>Punica granatum</i> 'Wonderful'	Pomegranate, Wonderful	15	15	133	F	D	M	M	M	N	N	T	Y	F	
<i>Solanum tuberosum</i>	Potato	2	2	n/a	V	D	M	H	L	N	N	S	Y	F	
<i>Prunus</i> x <i>domestica</i> 'French Improved'	Prune, French Improved	15	15	133	F	D	M	M	M	N	N	T	Y	F	August
<i>Prunus</i> x <i>domestica</i> 'Italian'	Prune, Italian	15	15	133	F	D	M	M	M	N	N	T	Y	F	Aug-Sept
<i>Prunus</i> x <i>domestica</i> 'Sugar'	Prune, Sugar	15	15	133	F	D	M	M	M	N	N	T	Y	F	August
<i>Cucurbita pepo</i>	Pumpkin	2	30	n/a	V	n/a	F	H	L	N	N	V	Y	F	
<i>Cydonia oblonga</i>	Quince	15	15	133	F	D	S	M, H	L, M	N	N	T	Y	F	
<i>Cydonia oblonga</i> 'Orange'	Quince, Orange	15	15	133	F	D	S	M, H	L, M	N	N	T	Y	F	
<i>Cydonia oblonga</i> 'Pineapple'	Quince, Pineapple	15	15	133	F	D	S	M, H	L, M	N	N	T	Y	F	
<i>Raphanus sativus</i>	Radish	1.5	.5	n/a	V	n/a	F	H	L	N	N	S	Y	P	
<i>Rosmarinus officinalis</i>	Rosemary	4	6	28	H	E	M, F	L, M	M	N	N	S	Y	F, P	
<i>Brassica napus</i>	Rutabaga	1	1	n/a	V	n/a	M	H	L	N	N	S	Y	F	(needs cold)
<i>Tragopogon porrifolius</i>	Salsify	2	1	n/a	V	n/a	F	H	L	N	N	S	Y	F, P	
<i>Allium cepa</i>	Shallot	1	.5	n/a	V	n/a	M	H	L	N	N	S	Y	F	
<i>Spinacia oleracea</i>	Spinach	.5	1	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Fragaria</i> 'Lassen'	Strawberry, Lassen	.5	.5	n/a	B	n/a	F	H	L	N	N	S	Y	F, P	Spring, Fall
<i>Fragaria</i> 'Shasta'	Strawberry, Shasta	.5	.5	n/a	B	n/a	F	H	L	N	N	S	Y	F, P	June-July
<i>Cucurbita pepo</i>	Squash, Summer/Winter	1	15	n/a	V	n/a	F	H	L	N	N	V	Y	F	
<i>Helianthus annuus</i>	Sunflower, Common	5	2	n/a	O	n/a	F	M	L	N	N	S	Y	F	
<i>Ipomoea batatas</i>	Sweet Potato	2	5	n/a	V	n/a	F	H	L	N	N	S, V	Y	F	
<i>Beta vulgaris</i>	Swiss Chard	1	1	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Physalis ixocarpa</i>	Tomatillo	3	4	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Lycopersicon</i> sp.	Tomato	8	4	n/a	V	n/a	F	H	L	N	N	S, V	Y	F	
<i>Brassica rapa</i>	Turnip	.5	.5	n/a	V	n/a	F	H	L	N	N	S	Y	F	
<i>Juglans rupestris</i> major	Walnut, Nogal/Arizona Walnut	40	30	530	N	D	M	M	M	N	N	T	N	F	
<i>Citrullus lanatus</i>	Watermelon	1	15	n/a	F	n/a	M	H	L	N	N	V	Y	F	

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