1. Agenda

   Documents: OPN_20150817.AG.PDF

2. Tree Advisory Committee Packet
   Tree Advisory Committee Packet

   Documents: OPN_20150817.PK.PDF

Tree Advisory Committee
Monday, August 17, 2015
Meeting Agenda
At City Hall
7:00 P.M.

Pursuant to Section 19.82 of the Wisconsin Statutes, notice is hereby given that the Tree Advisory Committee of the City of Fitchburg, Dane County Wisconsin, will meet at 7:00 p.m. on Monday, August 17, 2015 in the Conference Room at the Fitchburg City Hall, 5520 Lacy Road, Fitchburg, WI 53711 to consider the following:

- Call to Order
- Approval of Minutes – May 21, 2015
- Public Appearances - Non Agenda Items
- Communication
- Review and Approve Agenda
- Discussion/Approval: 2016 DNR Grant Application Components
- Discussion: McGaw Park Woodland Management Plan
- Discussion/Approval: Heat Island Mitigation Policy Options
- Discussion/Approval: Tree Preservation Policy Options
- Future Agenda Items
- Adjournment

NOTE: It is possible that members of and possibly a quorum of members of other government bodies of the municipality may be in attendance at the above stated meeting to gather information. No action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice. Please note that, upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information or to request this service, contact Fitchburg City Hall, 5520 Lacy Road, Fitchburg, WI 53711. 608-270-4200.

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Tree Advisory Committee
Thursday, May 21, 2015
Draft Minutes
At City Hall
7:00 P.M.

Pursuant to Section 19.82 of the Wisconsin Statutes, notice is hereby given that the Tree Advisory Committee of the City of Fitchburg, Dane County Wisconsin, will meet at 7:00 p.m. on Thursday, May 21, 2015 in the Meeting Room at the Fitchburg City Hall, 5520 Lacy Road, Fitchburg, WI 53711 to consider the following:

- Call to Order
  Call to order 7:10 PM, in attendance: Terrell Brock, Jeremy Hecht, Rod Bina, Diane Dillet, Melinda Douglass, Philip Krahn, Ed Bartell
- Approval of Minutes – April 16, 2015
  Douglass motioned to approved minutes, Dillet 2nd, motion to approve minutes carried.
- Public Appearances - Non Agenda Items
  None
- Communication
  Bartell discussed topics highlighted on attached Forestry Report
- Review and Approve Agenda
  Hecht motioned to approved agenda, Douglass 2nd, motion to approve agenda carried.
- Discussion: EAB Treatment and Removal Letters
  Bartell provided copies of letter for discussion. Comments and suggested edits offered by committee members. Bartell will incorporate and letter will be sent in early July 2015..
- Discussion: Urban Forestry Strategic Master Plan
  Bartell suggested delaying the public open house until August with a goal of having the plan completed and approved by the end of 2015. A new date was not set for the open house.
- Future Agenda Items
  - Next meeting Thursday, June 25, 2015
  - Draft of UFSMP
  - Public Open House
- Adjournment
- Bina motioned to adjourn, Hecht 2nd, meeting adjourned at 8:09 PM.

NOTE: It is possible that members of and possibly a quorum of members of other government bodies of the municipality may be in attendance at the above stated meeting to gather information. No action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice. Please note that, upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information or to request this service, contact Fitchburg City Hall, 5520 Lacy Road, Fitchburg, WI 53711. 608-270-4200.

Forestry Report – May 19, 2015

Project	Completion or Due Date
1. Met with DNR SW Urban Forestry Coor, Brian Wahl, to discuss 2015 Grant	3.3.15
2. Tower Hill Greenway – Tentative Restoration Plan.	3.20.14
a. Lath for set for planting trees	4.13.15
b. Met with residents on site	4.27.15
3. Gregory Vorontsov & neighborhood volunteers worked on Swan Creek Pk orchard	4.4.15
4. Attend Dane County Tree Board Meeting.	4.14.15, 5.19.15
5. Public works and parks maintenance staff pruning	4.15.15
a. McGaw Park Pine Trees	
b. Seminole Hills Estates	
c. Lacy Heights	
d. Orchard Pointe	
e. Clayton	
f. Rimrock	
g. Highlands of Seminole	
h. Swan Creek	
i. Fitchburg Center	
j. Fitchburg Tech Campus	
6. Tree Advisory Committee meeting.	4.21.15
7. Received deliverables from Urban Tree Alliance ash tree assessments for 2015 treatments and removals.	4.27.15
a. 254 to treat	6.30.15
b. 107 to remove	6.30.16
8. Celebrated Arbor Day/International Migratory Bird Day at McKee Farms Pk	5.2.15
9. Hired Philip Krahn for Parks & Forestry Asst. position	5.7.15
10. Herman Landscape start spring planting.	5.26.15
11. Meet with Harlan Hills Prairie Volunteers	
a. Consult with Field and Stream Restorations – Steve Banovetz for spring treatments	5.21.15
b. Seeding/planting	5.1.15
12. Urban Forestry Strategic Management Plan Open House – Tentative Date	5.21.15
13. Committee of the Whole update	4.22.15
14. Committee of the Whole EAB and UFSMP Presentation	7.22.15
15. Common Council UFSPM for Approval	8.25.15
16. Wood Utilization Research.	Ongoing

17. Remove declining or hazard trees. **Ongoing**

- **a.** Remove all flagging or declining ash trees **Ongoing**

18. Revise 5 -Year Urban Forest (Strategic) Management Plan with TAC. **Ongoing**

19. Continue City Tree Inventory. **Ongoing**

- **a.** Completed ROW in Tower Hill, Wildwood South, Country Vineyard, Country Heights, Greenfield/Gold Addition, Briarwood, Tarpleywick, Dommers View, Byrnewood..
- **b.** Currently working on ROWs in Wildwood then lacy Heights.
- **c.** LTE working to revise Oak Mapping Project
  - i. locate specimen oaks >200 years old & enter data into GIS. Ongoing

20. Miscellaneous Projects.

- **a.** Participate in Neighborhood Development Plans as necessary. Monthly

Responded to more than 75 calls, visits, and e-mails from residents, contractors, etc. **July-Aug**

Forestry Report – August 17, 2015

Project	Completion or Due Date
1. Inspect 2014 Spring Tree Planting	6.8.15
a. 4 warranty replacements out of 97 trees planted	
2. Inspected risk trees at	
a. 2649 Cochise – 38" silver maple	7.2.15
b. Oak Meadow Pk rec path – 27" pin oak	7.20.15
3. Attend Park Commission Meeting	7.9.15
4. Tower Hill Greenway maintenance mowing by Field & Stream Restoration	7.27.15
5. Quarry Hill Park fenceline restoration maintenance by Adaptive Restoration	7.15.15
6. Met with Strand & Assoc to discuss Verona Rd landscaping plan	7.16.15
7. Met with Johren, Holly & Jason Hankes (Fitchburg Ctr) re rec path tree root conflict	7.20.15
8. Inspected McGaw Park risk silver maple trees near rec path.	7.21.15
9. Met with Adaptive Restoration to discuss McGaw Park Forest Management Plan	7.28.15
a. Tree & Vegetation Survey begun	8.4.15
10. Inspect Dawley Conservancy near 2972 Woods Edge re dumping complaint	7.30.15
11. Attend Park Commission Meeting	8.6.15
12. Inspect ROW trees root conflict with new curb and gutter installation	8.10.15
13. Submit 2014 DNR UF Grant reimbursement request ($19,578.50)	8.15.15
14. Tree Advisory Committee meeting.	8.17.15
15. Attend Dane County Tree Board Meeting.	8.18.15
16. Send letter for ash tree Removals	8.20.15
a. 107 to remove	
17. Develop a plan for planting terrace trees in Maple Lawn Hts, Bewick and Hasz	8.21.15
18. Submit 2015 DNR UF Grant reimbursement request ($10,787.00)	8.23.15
19. Submit DNR Urban Forestry Grant Application	8.23.15
20. Wood Utilization Research.	Ongoing
21. Remove declining or hazard trees.	Ongoing
a. Remove all flagging or declining ash trees	Ongoing
22. Revise 5 -Year Urban Forest (Strategic) Management Plan with TAC.	Ongoing
23. Continue City Tree Inventory.	Ongoing

a. Completed ROW in Tower Hill, Wildwood South, Country Vineyard, Country Heights, Greenfield/Gold Addition, Briarwood, Tarpleywick, Dommers View, Byrnewood..

b. Currently working on ROWs in Wildwood then Lacy Heights.

c. LTE working to revise Oak Mapping Project

i. locate specimen oaks >200 years old & enter data into GIS. Ongoing

24. Miscellaneous Projects.

a. Participate in Neighborhood Development Plans as necessary. Monthly

Responded to more than 80 calls, visits, and e-mails from residents, contractors, etc. **July-Aug**

The DNR's 2016 Urban Forestry Grant Application Period has been announced.
You have until **Oct. 1, 2015** to apply. See the press release below for more information.
Note: **This year a resolution must accompany your application (even if you had one on file with us).**

Grants Available to Help Communities Develop, Manage Urban Forests
By Central Office August 4, 2015MADISON, Wis. -- Wisconsin city, town, village, county or, tribal governments and 501(c)(3) non-profit organizations can now apply for financial help for urban forestry projects under the Department of Natural Resources Urban Forestry Grant program.

The grants support new, innovative projects that will develop sustainable urban and community forestry programs, according to Suzann DaWalt, DNR urban forestry financing specialist.

"Applications will be ranked based on project outcomes, or the results the project will have on the urban forest," DaWalt said, adding those outcomes should align with one or more of the following DNR Urban Forestry program goals:

- enhance private property tree canopy;
- increase local ability to provide ongoing funding, services and markets;
- benefit multiple communities;
- utilize existing inventories; and
- increase the ability to provide education and outreach.

Other 2016 funding priorities include:

- Emerald Ash Borer management plans or insecticide treatment to preserve canopy.
- Long-term positive effect on urban tree canopy and the benefits it provides.
- Developing or enhancing community urban forestry programs.
- Projects could serve as a new model for others to adopt.

2016 DNR Urban Forestry Matching Grant Application

Project: EAB Treatment and Canopy Improvement

Component 1. EAB Treatment -- Component Cost $19,200

- Fourth year of EAB treatments of all healthy, well-formed public ash
- Treatment program is on a 3 year cycle
    - 2016 is first year of second round
- 156 trees to assess and a subset of those to treat: ~2300 DBH inches
    - Specimen trees and Save-an-Ash trees
- Injections will be done by city public works and parks employees
- 2015 cost was $6.97 per diameter inch
    - Assessment, insecticide, materials, labor, equipment

The long term outcome will be the preservation of mature trees and canopy. The selective removal of unhealthy or poorly-formed ash trees will slowly reduce the number in the urban forest avoiding an acute negative impact on the forest canopy and provide the opportunity to continue to improve the diversity of our forest.

Component 2. Arbor Day, Migratory Bird Day and Earth Day Celebration – Component Cost $2550

- Annual Event usually at Mckee Farms Park.
- 8 AM – 1 PM Saturday, May 7, 2016
- Agenda
    - Bird Walk
    - Tree Planting
    - Tree City, Growth Award and Bird City Award Presentations
    - 'Tree of the Year' Play
    - Tree and Bird Activities for Kids
    - Tree Walk
    - Pruning Demonstration
    - Refreshments

Component 3. Staff Training – Component Cost $4700

- Urban Forester and Parks and Forestry Assistant attend WAA Conference in Green Bay
- Urban Forester and Parks and Forestry Assistant attend UW-Extension Winter Series Workshop

.

Project Total: $26,350
City Share: $13,175
Grant Share: $13,175

Grant Project Ranking

Urban Forestry Grant applications will be ranked according to how well the projects align with the DNR program objectives and priorities for last year.

These include:
A) Long-term effect on urban tree canopy and the benefits it provides;
B) Emerald ash borer plans or insecticide treatment to preserve canopy;
C) Alignment with DNR urban forestry program goals;
D) Developing or enhancing municipal tree management programs**;** and,
E) Projects that could serve as a model for others to adopt.

While these priorities do not preclude funding any eligible project, applications that address the 2015 objectives and priorities will rank higher compared to those that do not.

Arnold Steve, Mayor
Introduced By

Parks Department
Drafted By

Parks Commission
Committees

September 3, 2015
Date

Resolution R-XX-15

PERMITTING THE PARKS DEPARTMENT TO APPLY FOR A DNR URBAN FORESTRY GRANT FOR 2016

WHEREAS, the City of Fitchburg is interested in further development and improvements of its urban forestry program; and

WHEREAS, financial aid is required to carry out the project;

NOW, THEREFORE, BE IT HEREBY RESOLVED, that the City of Fitchburg has budgeted a sum sufficient to complete the project and hereby authorizes Scott Endl, Director of Parks, Recreation and Forestry to act on behalf of the City of Fitchburg to submit an application to the State of Wisconsin Department of Natural Resources for any financial aid that may be available; sign documents; and take necessary actions to undertake, direct and complete the approved project.

BE IT FURTHER RESOLVED, that the City of Fitchburg will comply with state and federal rules for the programs; may perform force account work; will provide or be responsible for 100% of updating plans or ongoing operations and will obtain from the State of Wisconsin Department of Natural Resources approval in writing before any changes are made in the proposed project.

Adopted this _____ day of _____, 2015

Approved By:_____
Steve Arnold, Mayor

Attested By:_____
Patti Anderson, City Clerk

Forest Management Plan for McGaw Park
City of Fitchburg, Wisconsin
Proposal and Scope of Services
February 4, 2012

I. Scope of Services

1. Gather and review relevant background information:
    - City land stewardship goals and objectives
    - Conservation easements and land use agreements, if applicable
    - Existing reports that reference the property (county, town, etc.)
    - Historic and current landscape plans, if available
    - Current and proposed land use of adjoining parcels

2. Incorporate findings of 2011 Tree and Vegetation Survey to determine:
    - The effects of prior management
    - Current and future management needs
    - Resources requiring protection

3. Assess the abiotic environmental factors:
    - Slope, aspect, soil type, and erosion problems and relate these factors to existing and future vegetation and management recommendations

4. Determine phasing and funding needs for forest management

II. End Products

1. Two copies of a detailed and illustrated report containing:
    - A description of methodology.
    - Ecological information to aid in interpreting and understanding the assessment and management recommendations.
    - Funding sources relevant to forest management and ecological restoration
    - Results of the vegetation sampling and abiotic factors outlined in Sections I.2 and I.3 including:
    - A list of all observed species sorted by life form (tree, shrub, grass, forb, etc.) and whether they are native or exotic
    - A detailed description of existing conditions
    - A prioritized list of invasive species
    - Location and status of rare, threatened, and endangered species
    - Management recommendations designed to preserve and enhance ecological conditions, including:
        a. Native plant community restoration
        b. Forestry/woodland stewardship
        c. Invasive species control

d. A list of trees, shrubs, and herbaceous species recommended for planting
e. Implementation schedule
f. Estimated labor and materials costs for the recommended activities for a 5 year period, 2014-2018

III. Schedule

- An initial site visit to meet with City representative(s), gather background information, and walk the property during March or April 2013
- Attendance at 2 public meetings to discuss draft management recommendations
- Three vegetation survey site visits during April or May, June or July, and August or September 2013. Each visit is expected to take 4 to 8 hours to complete.
- End products will be provided on or before December 15, 2013

IV. Terms and Conditions

1. Billing will be conducted bi-weekly and will include a summary of the completed tasks.
2. The City will provide BioLogic with air photos, site maps, existing reports and other relevant site-related information at no cost.
3. All changes to this proposal must be mutually agreed upon.
4. Sales tax, if applicable, is not included in this estimate.

V. Cost

$4,950 to complete tasks outlined above, including materials.
Additional tasks, if requested, at $70.00/hour

VI. Optional services:

A. Naturalist or forester-guided walk/talk to interpret natural and cultural features of McGaw Park , discuss draft management recommendations, and solicit feedback from attendees ($450; 2 talks @ $225/talk)

B. Design content and obtain imagery for one sign interpreting the human and natural history of McGaw Park. Final product = print-quality 11" 17" PDF document (1@ $985)

Accepted by: _____ Date: _____

CHAPTER 52

CENTRAL HARDWOOD COVER TYPE

TYPE DESCRIPTION

Stand Composition

The central hardwood cover type consists of variable associations of upland hardwood species, predominantly oaks (*Quercus spp*.), shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), elms (*Ulmus spp*.), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), white ash (*Fraxinus americana*), green ash (*Fraxinus pensylvanica*), basswood (*Tilia americana*), hackberry (*Celtis occidentalis*), and sugar maple (*Acer saccharum*). This association does not satisfy the defining criteria for:

Oak (Chapter 41) – at least 50% of the basal area is oak
Red maple (Chapter 51) – at least 50% of the basal area is red maple
Northern Hardwood (Chapter 40) – at least 50% of the basal area is any combination of sugar maple, beech, basswood, white ash, yellow birch.

Tree size, age, and condition in addition to stand composition, reflect physical site factors, natural history, and human impacts (e.g. fire, grazing, harvesting, and clearing for agriculture). The present composition of many stands depends more upon the past history of the stand than on site quality. Poor harvesting practices (e.g. high grading, diameter limit cutting, and commercial clear cutting) and grazing have resulted in many low density, low quality stands with high density shrub layers.

Figure 52.1: Central Hardwood range (USA) (Clark & Hutchinson 1989)

Associated Species

Aspen (Populus grandidentata, P. tremuloides), black walnut (Juglans nigra), butternut (J. cinerea), honey locust (Gleditsia triacanthos), black locust (Robinia pseudoacacia), box elder (Acer negundo), white birch (Betula papyrifera), ironwood (Ostrya virginana), white pine (Pinus strobes).

Ecological Regions and Range of Habitat Types

The central hardwood forest region is one of the largest hardwood forest areas in the nation (Fig. 52-1). Four distinct tree associations defined within this type are oak-hickory, oak-pine, mixed hardwoods, and elm-ash-cottonwood. In Wisconsin, the central hardwood type is located within Province 222 which lies south of the Tension Zone (Fig.52-2). All Ecological Landscape units within this Province except the Central Sand Plains contain a significant component of the central hardwood type.

Compositional variation occurs within the central hardwood type across ecological units (Table 52-1). These variations are normally associated with a significant oak canopy component
(Figure 52-3).

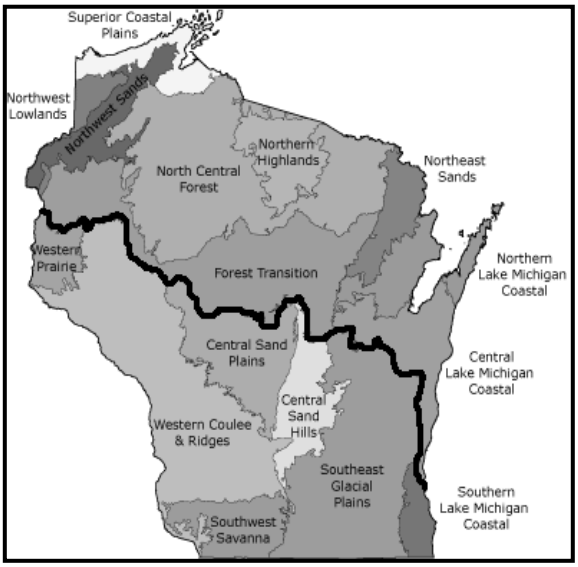
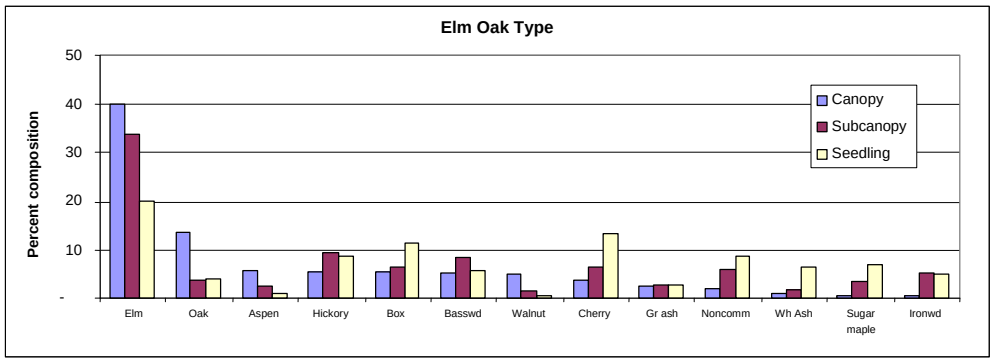


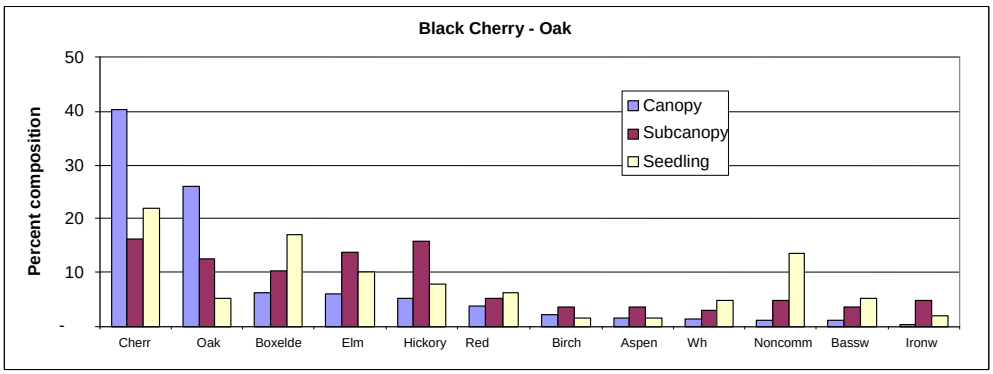
Figure 52.2: Central Hardwood cover type area of application (WI). CH occurs south of the dark line which represents the approximate location of the Tension Zone, and separates province 222 in the south from 212 in northern WI.

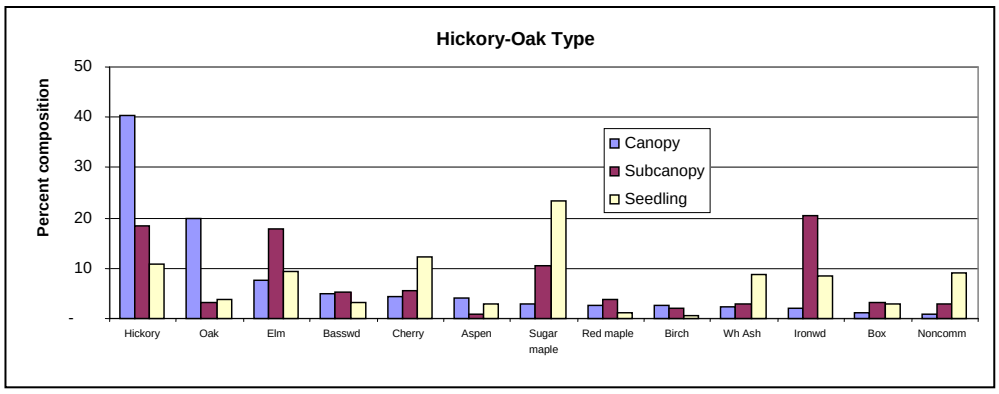
Table 52.1 Variation in abundance and composition of the central hardwood cover type by ecological regions in Southern Wisconsin (Province 222 except the Central Sand Plains). The Western Coulee and Ridges Unit is divided into north and south subunits based on FIA interpretation. That division extends east/west across the unit near La Crosse.

Ecological Landscape Unit (ELU)	Central Hardwood Acres Within ELU	Compositional Variation Within Central Hardwood Type (% of acreage)		
Western Prairie	12,370	77% Elm-oak	23% Hickory-oak	0% Cherry-oak
Western Coulee and Ridges-North	115,616	31% Elm-oak	41% Hickory-oak	29% Cherry-oak
Western Coulee and Ridges-South	361,864	36% Elm-oak	50% Hickory-oak	14% Cherry-oak
Central Sand Hills	28,889	36% Elm-oak	10% Hickory-oak	53% Cherry-oak
Southwest Savanna	65,543	69% Elm-oak	13% Hickory-oak	18% Cherry-oak
Southeast Glacial Plains	97,994	49% Elm-oak	27% Hickory-oak	24% Cherry-oak
Southern Lake Michigan Coastal	9,128	0% Elm-oak	65% Hickory-oak	35% Cherry-oak

Figure 52.3 Compositional variations within the central hardwood cover type in Southern Wisconsin.
The three bar charts demonstrate compositional differences among the three major subgroups of the type.







City of Fitchburg – Urban Forestry

Parking Lot Shade Ordinance & Heat Mitigation

Precedent Studies of other Municipality Ordinances

Information to assist the possible development of parking lot heat mitigation guidelines within the 2015 update of Fitchburg's Urban Forestry Strategic Management Plan.

(This particular packet & appendix prepared for Tree Advisory Committee, July 2015)

Notes Compiled July 2015
Philip Krahn (Fitchburg Parks & Forestry Assistant)

Reasons for Parking Lot Shade Ordinance

Within hot climates, city environments are prone to extreme overheating due to man made surfaces, such as pavement parking lots, that readily absorb solar heat. Overheated parking lots have many detrimental effects including: decreased comfort, health issues, pollution, water quality, etc.

In response to these negative effects, many municipalities are implementing ordinances that require new or remodeled parking lots to include certain shade tree plantings or other heat reducing landscaping.

Ordinance Placement within City Code

Requirements for tree planting within parking lots are sometimes enacted though a specific parking lot shading ordinance, but the requirements may be incorporated into an existing code related to trees, landscaping, parking lots, planning, or elsewhere.

Often times shade ordinances are blended with other "green" design elements such as management of pollution runoff, storm water swales, permeable surfaces, etc.

Ordinance Key Elements

- ***Choose a type of Standard/Criterion***
  - The most common type of standard requires parking lots to reach a certain percentage of shade coverage within a determined timeframe after construction. 50% after 15 years is a typical target.
    - **Please see Appendix items #1, #2 for how this type of standard is written within the municipal codes of Davis and Sacramento.**
  - Minimum distance from a parking stall to a planted tree
  - Tree to parking stall ratio
  - Parking lot must meet a certain ratio of landscaped surface area (flower beds, grasses, etc.) to paved stall area.
- ***Shade Calculation Method***
  - If a standard of shade coverage is established, there must be a systematic method in which to calculate shade vs nonshaded area.
  - Calculations are future based. Therefore, shade is based on the predicted canopy extent of the trees at mature age, not planting size.
    - **Please see Appendix item #3 for a rough example of a shade area calculation. This is only one example. Many variations exist. The Forest Service has released several improved shade calculation methods.**

- ***Site Condition & Planting Guidelines***
  - Since parking lots are typically harsh environment for tree growth, it is common for an ordinance to include site condition guidelines to help promote tree health and ensure maximum canopy extent is reached.
  - Designs may be required to only plant trees included on a master list of tree species suitable for growth within parking lot conditions
  - Components of the site condition guidelines can include: planting bed dimensions, soil type, orientation, drainage, etc.
    - **Please see Appendix item #4 for example of a parking lot shade tree species list, and Appendix item #5 for planting bed dimensions example. These are just small portions of what can be rather extensive parking lot guidelines.**
- ***Design Application & Approval***
  - In order to ensure regulations are being met, an ordinance may require a landscape design plan to be submitted for review. Plans often show:
    - All landscaped areas
    - Clear representation of total paved areas, stalls, and driveways to be shaded by tree canopies
    - Tree canopies drawn to scale representing the predicted canopy extent at a mature or determined growth periods
    - Accurate location and species type of proposed trees
    - Planting bed dimensions or other site condition components
  - Plans are usually approved any combination of an urban forester, landscape architect, planning department, tree committee, etc.
  - Plans are typically approved before the issuance of building permit, etc.
    - **Please see Appendix item #6 for Madison's parking lot approval application. Madison has some landscaping regulations within parking lots, but none regarding shade. Fitchburg could adopt an application form similar to Madison's, with the addition of more specific shade tree provisions**
- ***Installation Inspection & Certificate of Compliance***
  - In addition to the application and approval of a parking lot plan, ordinances often follow up with a simple inspection after installation.
  - An urban forester, landscape architect, or other appropriate municipal worker will inspect the completed parking lot to make sure it fulfills the approved plan. A certificate of compliance may validate the inspection.
    - **Please see Appendix item #7 for an example of a certificate of compliance from Sacramento's parking lot shade ordinance**
- ***Maintenance, Monitoring, & Enforcement***
  - Ordinances may include a section stating that all tree, shrub, and landscaping must be properly maintained for the life of the parking facility in satisfaction of the established standards and guidelines.

- An emphasis should be placed on timely pruning and training of all parking lot trees to ensure proper health and to minimize hazardous risk of trees and limbs falling on pedestrians, cars, etc.
- Any alterations or desired removals of established parking lot trees must first be approved by the city urban forester
- It is appropriate for the city to periodically inspect established parking lots to ensure continued compliance.
- Violations of any set regulations could be enforced warnings, fines, abatement orders, the withholding of occupancy permits, etc.

Additional Considerations

Several studies regarding parking lot shade and urban heat mitigation have been spearheaded by the USDA Forest Service, Center for Urban Forest Research.

One long term study is examining the effectiveness of parking lot shade ordinances within several California cities such as Davis, Sacramento, and Los Angeles. The study has resulted in two subsequent publications that highlight the management struggles of these ordinances, and a series of ordinance recommendations to resolve these issues.

The Forest Service notes that these additional factors (among many others) should be considered:

- Provisions to deal with the common conflicts between parking lot trees and business signage and parking area lighting.
- To simplify the process of determining compliance, the true angle of deflection of natural sunlight shall not be considered. Shaded areas shall be assumed to be only those portions of a paved parking lot directly beneath the shading canopy.
- Calculations for tree shade provided in the plan to include only partial credit for trees that are located on the periphery of the lot because only a portion of the canopies of these "edge" trees actually shades pavement
- Requirement that removed trees be replaced according to a replacement schedule based on equivalent size or value
- If the degree of overlap between trees is greater than 15 percent, a then it will be necessary to perform individual calculation to determine the area of shading.
- Do not allow substitutions after the plans have been approved
- Make provisions to restrict parking lot sizes to the minimum appropriate number of stalls. This will reduce the amount of unused stalls that generate excess heat.

- Very strong emphasis on enforcement. Most failures of parking lot shade ordinances are a result of poor enforcement and maintenance after installation.
- Enforcement may be necessary now to keep an ordinance successful, however in the future when an ordinance becomes firmly established and well-designed parking lots become an expected mindset within your community, the importance enforcement may decrease. The primary motivation for following a shade ordinance should be the positive benefits it supplies and should not be the fear of penalties.

Appendix

1. **City of Davis, California Municipal Code – "Parking Lot Trees"**
2. **City of Sacramento, California Municipal Code – "Tree Shading Requirements for Parking Lots"**
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4. **Parking Lot Tree Species List – Example**
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Article 37.04 PARKING LOT TREES

37.04.010 Applicability.

Regulations contained within this article relate to all improved off-street parking lots within the City of Davis. Per Section 40.25.100 of the Davis Municipal Code and the parking lot shading guidelines, fifty percent of the paved parking lot surface shall be shaded with tree canopies within fifteen years of the acquisition of a building permit. (Ord. 2099 § 1, 2002)

37.04.020 Parking lot shading tree selection and shading plan.

Tree selection shall be in accordance with the provisions of the parking lot shading guidelines and the city master tree list; only trees identified as parking lot shade trees may be planted unless otherwise approved by the director. The tree species should be varied, but are not required to be, throughout the parking lot.

A parking lot shading plan and related shade calculations shall be submitted to the community development and sustainability department along with the building permit or discretionary project permit for all new and/or reconstructed parking lots. (Ord. 2099 § 1, 2002)

37.04.030 Parking lot planting/maintenance standards.

Parking lot planter design, materials, planting and irrigation details shall be as per the city tree planting and maintenance specifications and the parking lot shading guidelines. (Ord. 2099 § 1, 2002)

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17.612.040 Tree shading requirements for parking lots.

A. Surface parking facilities. Except as provided below, the shading requirement set forth in subsection B applies to all surface parking facilities, including all surfacing on which a vehicle can drive and all parking stalls; all drives and drive-through lanes within the property regardless of length; and all maneuvering areas regardless of depth.

1. Expansion of existing nonconforming parking facilities. When a parking facility that does not comply with the shading requirement is expanded by an amount, in area or number of spaces, equal to or greater than 50% within any continuous three-year period, the entire parking facility, including the existing area and the expansion, shall comply with the shading requirement. When a parking facility that does not comply with the shading requirement is expanded by an amount, in area or number of spaces, less than 50%, only the expansion must comply with the shading requirement.

2. Exceptions. The following surfaced areas are exempt from the shading requirement set forth in subsection B: single unit and duplex dwelling parking areas; model home temporary sales office parking areas; temporary commercial building parking areas; parking structures; carports; enclosed parking spaces; truck loading areas in front of overhead doors; truck maneuvering and parking areas unconnected to and exclusive of any vehicle parking; surfaced areas not to be used for vehicle parking, driving or maneuvering, provided they are made inaccessible to vehicles by a barrier such as bollards or fencing; and vehicle display, sales, service, and storage areas, provided that the surface parking area of the use shall comply with the shading requirements.

B. Tree shading requirement. Trees shall be planted and maintained throughout the surface parking facility to ensure that, within 15 years after establishment of the parking facility, at least 50% of the parking facility will be shaded. All planting, soil volumes, and maintenance shall comply with the parking facility tree shading design and maintenance guidelines.

C. Parking facility tree shading design and maintenance guidelines. Parking facility tree shading design and maintenance guidelines shall be adopted by resolution of the city council. The guidelines may be adopted following at least one public hearing before the planning and design commission and one public hearing before the city council. Each hearing shall be noticed in the same manner as hearings on text amendments pursuant to chapter 17.916.

D. Shading calculation. Shading is calculated by using the expected diameter of the tree crown at 15 years. Each planting area shall be of adequate size for the landscaping approved and shall have adequate irrigation for that landscaping. The planning director, in consultation with the city landscape architect, shall establish a list of species appropriate for providing shade in parking facilities, and trees to be planted in accordance with the regulations of this section shall be selected from this list. Landscape and shading plans shall be submitted to the building division at the time of application for building permit, and the plans shall be referred to the planning director for review for compliance with the requirements of this section. As part of this review, the planning director has discretion to modify tree shading requirements under power lines and other obstructions that prohibit strict compliance with shading requirements and to give shading credit for photovoltaic arrays, off-site trees and structures, sidewalk canopies, and other structures, where appropriate.

E. Installation. Upon completion of the installation of shade trees, the landscape designer shall certify that the shading complies with all requirements of this section. Certification shall be accomplished by the completion of the landscape certificate, pursuant to section 15.92.090.

F. Maintenance. All trees and associated landscaping, such as shrubs and turf, planted or installed pursuant to this section shall be properly maintained for the life of the facility pursuant to the surface parking facility tree shading design and maintenance guidelines established by resolution of the city council as provided in this section. The maintenance obligation provided herein applies to all parking facilities subject to the shading requirement, whether approved prior to, contemporaneously with, or after the effective date of the parking facility tree shading design and maintenance guidelines. Any required trees or other plantings that die or are improperly maintained shall be replaced with healthy specimens of similar species and size, provided that replacement trees shall not be required to exceed 48 inch box size. Removal and replacement of trees that have caused damage to sidewalks or other infrastructure shall be reviewed and approved by the city arborist prior to tree removal. (Ord. 2013-0020 § 1; Ord. 2013-0007 § 1)

View the mobile version.

Shade calculations should indicate:

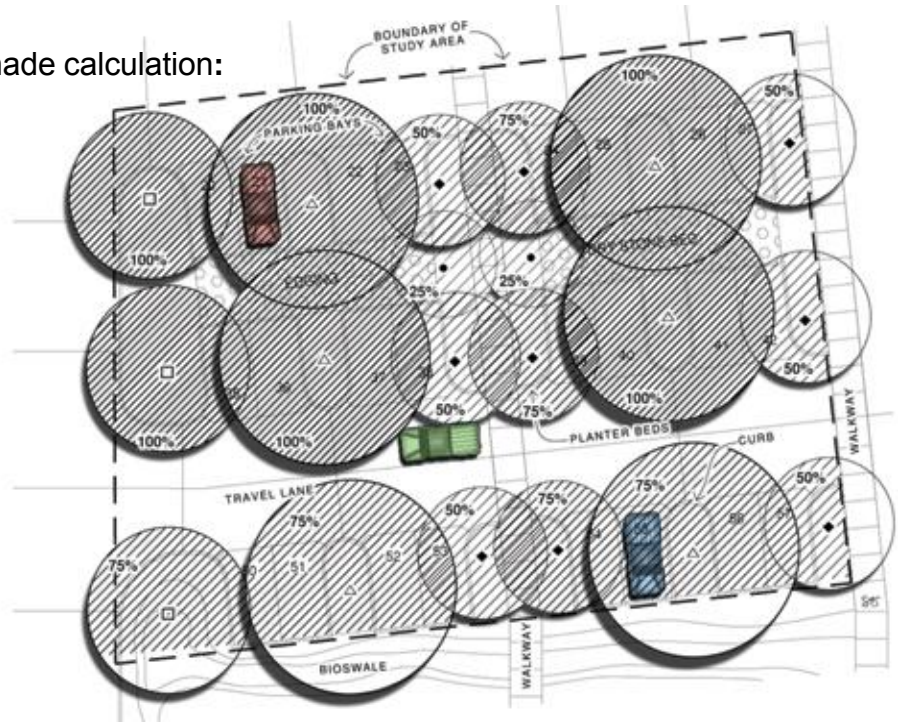
1. Tree Symbols
2. Tree Type
3. Tree Quantity
4. Surfaced Area (including carports, garages, etc.)
5. Shade Area Required
6. Shade Area Proposed
7. Shading Credit Accorded to Each Tree (F or 100%, TQ or 75%, H or 50%, Q or 25%)

Sample Parking Lot Shade Calculation Table:

Symbol	Botanical Name/ Common Name	Quantity @ Full Shade / Sq. Ft.	Quantity @ ¾ Shade / Sq. Ft.	Quantity @ ½ Shade / Sq. Ft.	Quantity @ ¼ Shade / Sq. Ft.	Total (sq. ft.)
T1	*Laurus nobilis*/ Sweet Bay	1 @ 491	2 @ 368	5 @ 246		2457
T2	*Quercus agrifolia* Coast Live Oak		2 @ 722	2 @ 481	2 @ 240	2886
T3	*Pinus Patula* Jelecote Pine		1@ 530	7 @ 354		3008
					TOTAL TREE SHADE	8351
Surfaced Area:		Parking Lot		16240	TOTAL SURFACED AREA =	17740
		Covered Stalls (garages, carports, etc.)		1500		
					SHADE AREA REQUIRED =	8870
					If applicable, TOTAL AUXILIARY SHADE* =	1450
					TOTAL SHADE PROVIDED =	
					PERCENT SHADE =	55.2%

*NOTE: *Auxiliary shade is the total* ***parking*** *area under covered stalls (carports, garages, etc.), not the total covered area.*

Sample Illustration of shade calculation**:**



MASTER PARKING LOT
TREE LIST
(Revised June 1999)

Botanical name **Common Name**	**MATURE HEIGHT (FT)**	**REMARKS**	**TYPE**
35' Crown Diameter (100% = 962 sq.ft., 75% = 722 sq.ft., 50% = 481 sq. ft., 25% = 240 sq.ft.)			
Celtis australis European hackberry	40	slippery fruit	D
Celtis occidentalis common hackberry	60	slippery fruit, mistletoe	D
Fraxinus americana Autumn Purple, Chicago Regal - white ash	40	borer, needs irrigation	D
Fraxinus pennsylvanica Patmor Leprechaun, Centerpoint - green ash	45	borer	D
Morus alba Fan-San, Kingan, Stribling fruitless mulberry	60	train head	D
Pistacia chinensis Keith Davey (male clones) Chinese pistache	60	verticillium	D
Platanus acerifolia Yarwood or Bloodgood London plane tree	70	litter, anthracnose, powdery mildew	D
Platanus orientalis oriental plane tree	40	litter, anthracnose	D
Quercus frainetto Forest Green Forest Green oak	50	acorns	D
Quercus lobata valley oak	70	acorns	D
Quercus suber cork oak	80	acorns	E
Zelkova serrata Green Vase Green Vase zelkova	50	verticillium, shallow roots	D
Fraxinus uhdei (cold-tolerant clones) Mexican ash	70	shallow roots, frost sensitive	D
Quercus agrifolia, ilex, virginiana coastal live, holly, and southern live oak	40-60	acorns	E

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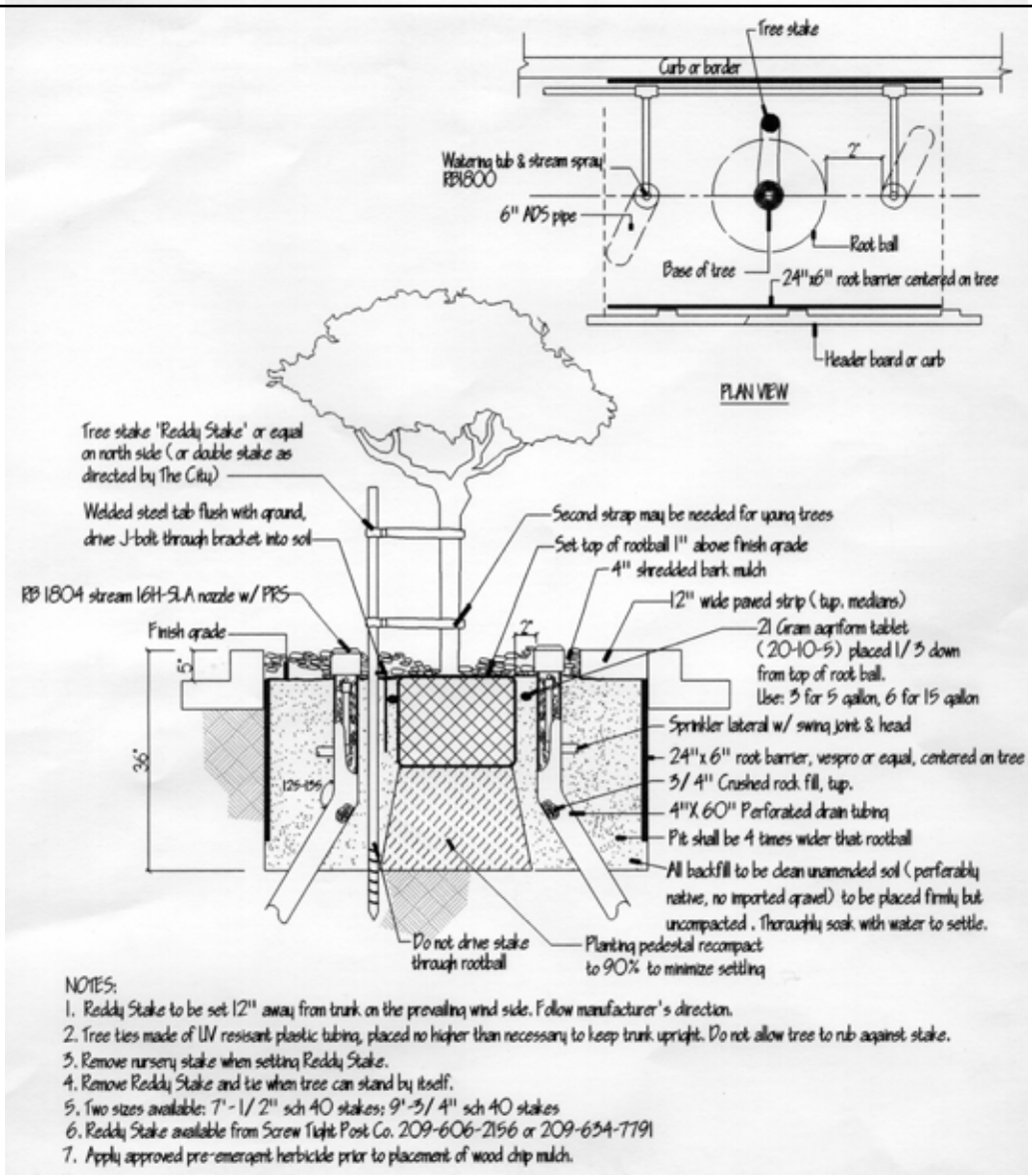
Note:
1) D = Deciduous Tree; E = Evergreen Tree.
2) Crown diameters are estimated for 15-years after planting.
3) Trees in shaded cells are for trial use and should be planted in small numbers.
4) Trees not specifically listed in the table may be used upon approval from the city's arborist.

Planting and Irrigation of Parking Lot Shade Trees

Planting: Proper planting procedure is essential in achieving the best growth of the tree and shall be utilized. This includes but is not limited to: tree spacing, tree well size, soil composition, irrigation, and maintenance. The entire tree planting area (tree well, island, or strip) shall be excavated to a depth of 5'-0'. Planter shall be backfilled with native soil and necessary amendment prior tree planting.

Irrigation Detail: All parking lot shade trees shall be irrigated with a minimum (2) deep watering tubes. All deep watering tubes shall be installed as per the city's standard detail for parking lot tree planting and irrigation (see detail below).

PARKING LOT TREE PLANTING/IRRIGATION STANDARD DETAIL



Department of Planning & Community & Economic Development
215 Martin Luther King, Jr. Blvd., Ste. LL-100
Madison, WI 53703
Phone: 266-4551 Email: Zoning@cityofmadison.com

Parking Lot / Site Plan Approval Application Checklist

Instructions: Please complete this form and submit it with all the materials necessary for a parking lot plan review and approval. Check boxes for the items submitted that apply to your project. If you are not sure about what to show or submit, call the appropriate agency (*see Box G)*. Once your application is accepted, staff will review, approve and return your application materials within 7 working days or sooner.

Site Address		
Contact Person	Company	Phone/FAX
Contact Person Address		
Project Type (check one): ❑ New ❑ Alteration		

A. These items must be included with an application:

- ❑ 1. Scaled drawing(s): 1" = 20' or similar: 5 sets
- ❑ 2. Conditional Use or PD/SIP approval letter (*if applicable)*
- ❑ 3. Driveway Opening Permit application
- ❑ 4. Easements for joint driveways or joined parking lots on separate parcels (*if applicable)*
- ❑ 5. Land Disturbing Activity Permit Application (*sizes 1 acre or more in size)*
- ❑ 6. Erosion Control Plan: 5 sets (*sizes 1 acre or more in size-See Example Plan 2)*
- ❑ 7. Landscape Plan/Worksheet (*if applicable per Sec. 28.142(2))*
- ❑ 8. Outdoor Lighting Plan and manufacturers specs (*if applicable)*

B. Information about your property that must be shown on your drawing(s). See Example Plan W:

- ❑ 9. Project information block on first page of plan
- ❑ 10. Property lines
- ❑ 11. Abutting right-of-way, roadways, driveways and terraces shown and dimensioned
- ❑ 12. Elevations of existing and proposed site to City datum
- ❑ 13. Elevation of top of curb
- ❑ 14. Storm sewers or drainage pattern (*See Example Plan Y)*
- ❑ 15. Proposed driveway radii
- ❑ 16. Type of surface on driveway, approach and lot (*grass, landscaping, concrete, bituminous paving, mulch, etc.)*
- ❑ 17. Location of existing and proposed impervious surfaces
- ❑ 18. Means of separation between parking lot and sidewalk or adjoining property
- ❑ 19. Tree islands
- ❑ 20. Screening or landscaping (*See Example Plan X)*
- ❑ 21. On-site fire hydrants

C. Information about the structures that must be shown on your drawing:

- ❑ 22. Existing structures (*footprints and dimensions*)
- ❑ 23. Proposed structures (*footprints and dimensions)*
- ❑ 24. Setbacks and distance to lot lines (*front, rear and sides)*

OFFICE USE ONLY:

Date/Time Received:	Accepted:
Staff Person	

D. Parking layout information that must be on your drawing(s). See Example Plan W:

- ❑ 25. Dimensions of parking stalls and drive aisles
- ❑ 26. Location of accessible parking stalls
- ❑ 27. Location of accessible parking stall signs
- ❑ 28. Location and width of accessibility ramps
- ❑ 29. Location of loading facilities
- ❑ 30. Bicycle parking rack locations, spaces, and rack detail

E. "Off-property" information that must be shown on your drawing(s):

- ❑ 31. Trees, poles, signs in the right-of-way (*if applicable)*
- ❑ 32. Medians (*if applicable)*
- ❑ 33. Driveway openings directly across the street *(if applicable)*
- ❑ 34. Distance to nearest intersection
- ❑ 35. Fire hydrants within 500 feet of your property line

F. Other information you want staff to know:

G. Questions: Call City Staff for help.

ZONING	Building Use	266-4551
	Setbacks	
	Landscaping	
	Occupancy	
TRAFFIC ENGINEERING	Parking lot geometrics	266-4761
ENGINEERING	Drainage	266-4751
	Land disturbing activity	
	Soil erosion	
FIRE	Fire hydrants / access	266-4484
BUILDING INSPECTION	Parking lot lighting	266-4551

6/24/14

CITY OF MADISON
LANDSCAPE WORKSHEET

Section 28.142 Madison General Ordinance

Project Location / Address _____

Name of Project _____

Owner / Contact _____

Contact Phone _____ Contact Email _____

**** Landscape plans for zoning lots greater than ten thousand (10,000) square feet in size MUST be prepared by a registered landscape architect. ****

Applicability

The following standards apply to all exterior construction and development activity, including the expansion of existing buildings, structures and parking lots, except the construction of detached single-family and two-family dwellings and their accessory structures. The entire development site must be brought up to compliance with this section unless **all** of the following conditions apply, in which case only the affected areas need to be brought up to compliance:

(a) The area of site disturbance is less than ten percent (10%) of the entire development site during any ten-(10) year period.

(b) Gross floor area is only increased by ten percent (10%) during any ten-(10) year period.

(c) No demolition of a principal building is involved.

(d) Any displaced landscaping elements must be replaced on the site and shown on a revised landscaping plan.

Landscape Calculations and Distribution

Required landscaped areas shall be calculated based upon the total developed area of the property. Developed area is defined as that area within a single contiguous boundary which is made up of structures, parking, driveways and docking/loading facilities, but excluding the area of any building footprint at grade, land designated for open space uses such as athletic fields, and undeveloped land area on the same zoning lot. There are three methods for calculating landscape points depending on the size of the lot and Zoning District.

(a) For all lots except those described in (b) and (c) below, five (5) landscape points shall be provided for each three hundred (300) square feet of developed area.

Total square footage of developed area _____

Total landscape points required _____

(b) **For lots larger than five (5) acres**, points shall be provided at five (5) points per three hundred (300) square feet for the first five (5) developed acres, and one (1) point per one hundred (100) square feet for all additional acres.

Total square footage of developed area _____

Five (5) acres = 217,800 square feet

First five (5) developed acres = 3,630 points

Remainder of developed area _____

Total landscape points required _____

(c) **For the Industrial – Limited (IL) and Industrial – General (IG) districts**, one (1) point shall be provided per one hundred (100) square feet of developed area.

Total square footage of developed area _____

Total landscape points required _____

Tabulation of Points and Credits

Use the table to indicate the quantity and points for all existing and proposed landscape elements.

Plant Type/ Element	Minimum Size at Installation	Points	Credits/ Existing Landscaping		New/ Proposed Landscaping	
			Quantity	Points Achieved	Quantity	Points Achieved
Overstory deciduous tree	2½ inch caliper measured diameter at breast height (dbh)	35				
Tall evergreen tree (i.e. pine, spruce)	5-6 feet tall	35				
Ornamental tree	1 1/2 inch caliper	15				
Upright evergreen shrub (i.e. arborvitae)	3-4 feet tall	10				
Shrub, deciduous	#3 gallon container size, Min. 12"-24"	3				
Shrub, evergreen	#3 gallon container size, Min. 12"-24"	4				
Ornamental grasses/ perennials	#1 gallon container size, Min. 8"-18"	2				
Ornamental/ decorative fencing or wall	n/a	4 per 10 lineal ft.				
Existing significant specimen tree	Minimum size: 2 ½ inch caliper dbh. *Trees must be within developed area and cannot comprise more than 30% of total required points.	14 per caliper inch dbh. Maximum points per tree: 200				
Landscape furniture for public seating and/or transit connections	* Furniture must be within developed area, publically accessible, and cannot comprise more than 5% of total required points.	5 points per "seat"				
Sub Totals						

Total Number of Points Provided _____

* As determined by ANSI, ANLA- American standards for nursery stock. For each size, minimum plant sizes shall conform to the specifications as stated in the current American Standard for Nursery Stock.

Landscaping shall be distributed throughout the property along street frontages, within parking lot interiors, as foundation plantings, or as general site landscaping. The total number of landscape points provided shall be distributed on the property as follows.

Total Developed Area

Required landscaped areas shall be calculated based upon the total developed area of the property. Developed area is defined as that area within a single contiguous boundary which is made up of structures, parking, driveways and docking/loading facilities, but excluding the area of any building footprint at grade, land designated for open space uses such as athletic fields, and undeveloped land area on the same zoning lot.

Development Frontage Landscaping

Landscaping and/or ornamental fencing shall be provided between buildings or parking areas and the adjacent street(s), except where buildings are placed at the sidewalk. Landscape material shall include a mix of plant materials.

Interior Parking Lot Landscaping

The purpose of interior parking lot landscaping is to improve the appearance of parking lots, provide shade, and improve stormwater infiltration. **All parking lots with twenty (20) or more parking spaces** shall be landscaped in accordance with the interior parking lot standards.

Foundation Plantings

Foundation plantings shall be installed along building facades, except where building facades directly abut the sidewalk, plaza, or other hardscape features. Foundation plantings shall consist primarily of shrubs, perennials, and native grasses.

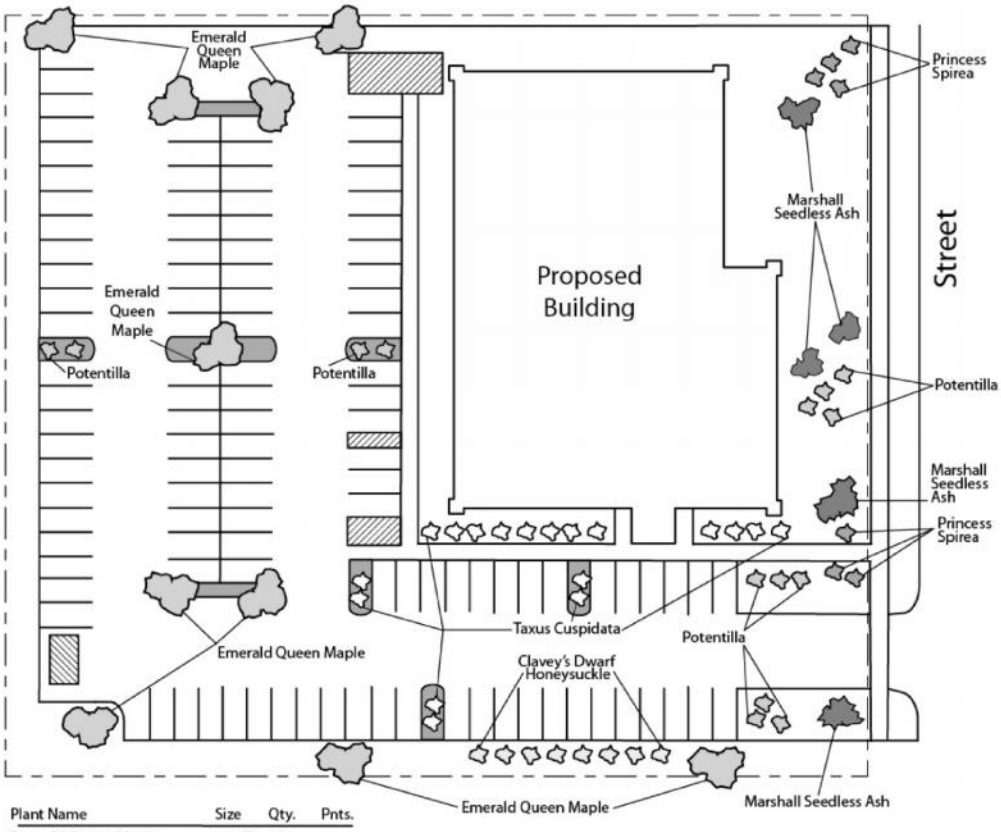
Screening Along District Boundaries

Screening shall be provided along side and rear property boundaries between commercial, mixed use or industrial districts and residential districts.

Screening of Other Site Elements

The following site elements shall be screened in compatibility with the design elements, materials and colors used elsewhere on the site: refuse disposal areas, outdoor storage areas, loading areas, and mechanical equipment.

Example Landscape Plan



Plant Name	Size	Qty.	Pnts.
Emerald Queen Maple	2-2.5"	9	-
Marshall Seedless Ash	2-2.5"	4	450
Clavey's Dwarf Honelysuckle	1 Gal	8	24
Princess Spirea	1 Gal	7	21
Potentilla	1 Gal	10	30
Taxus Cuspidata	2 Gal	12	60
		TOTAL	585

Call City Zoning, 266-4551, with your questions about this type of plan

LANDSCAPE PLAN AND LANDSCAPE WORKSHEET INSTRUCTIONS

Refer to Zoning Code Section 28.142 LANDSCAPING AND SCREENING REQUIREMENTS for the complete requirements for preparing and submitting a Landscape Plan and Landscape Worksheet.

Applicability.

The following standards apply to all exterior construction and development activity, including the expansion of existing buildings, structures and parking lots, except the construction of detached single-family and two-family dwellings and their accessory structures. The entire development site must be brought up to compliance with this section unless all of the following conditions apply, in which case only the affected areas need to be brought up to compliance:

(a) The area of site disturbance is less than ten percent (10%) of the entire development site during any ten-(10) year period.

(b) Gross floor area is only increased by ten percent (10%) during any ten-(10) year period.

(c) No demolition of a principal building is involved.

(d) Any displaced landscaping elements must be replaced on the site and shown on a revised landscaping plan.

Landscape Plan and Design Standards.

Landscape plans shall be submitted as a component of a site plan, where required, or as a component of applications for other actions, including zoning permits, where applicable. Landscape plans for zoning lots greater than ten thousand (10,000) square feet in size must be prepared by a registered landscape architect.

(a) Elements of the landscape plan shall include the following:

1. Plant list including common and Latin names, size and root condition (i.e. container or ball & burlap).
2. Site amenities, including bike racks, benches, trash receptacles, etc.
3. Storage areas including trash and loading.
4. Lighting (landscape, pedestrian or parking area).
5. Irrigation.
6. Hard surface materials.
7. Labeling of mulching, edging and curbing.
8. Areas of seeding or sodding.
9. Areas to remain undisturbed and limits of land disturbance.
10. Plants shall be depicted at their size at sixty percent (60%) of growth.
11. Existing trees eight (8) inches or more in diameter.
12. Site grading plan, including stormwater management, if applicable.

(b) Plant Selection. Plant materials provided in conformance with the provisions of this section shall be nursery quality and tolerant of individual site microclimates.

(c) Mulch shall consist of shredded bark, chipped wood or other organic material installed at a minimum depth of two (2) inches.

Landscape Calculations and Distribution.

Required landscaped areas shall be calculated based upon the total developed area of the property. Developed area, for the purpose of this requirement, is defined as that area within a single contiguous boundary which is made up of structures, parking driveways and docking/loading facilities, but **excluding** the area of any building footprint at grade, land designated for open space uses such as athletic fields, and undeveloped land area on the same zoning lot.

(a) Landscaping shall be distributed throughout the property along street frontages, within parking lot interiors, and as foundation plantings, or as general site landscaping.

(b) Planting beds or planted areas must have at least seventy-five percent (75%) vegetative cover.

(c) Canopy tree diversity requirements for new trees:

1. If the development site has fewer than 5 canopy trees, no tree diversity is required.
2. If the development site has between 5 and 50 canopy trees, no single species may comprise more than 33% of trees.
3. If the development site has more than 50 canopy trees, no single species may comprise more than 20% of trees.

Development Frontage Landscaping.

Landscaping and/or ornamental fencing shall be provided between buildings or parking areas and the adjacent street(s), except where buildings are placed at the sidewalk. Landscape material shall include a mix of plant material meeting the following minimum requirements:

(a) One (1) overstory deciduous tree and five (5) shrubs shall be planted for each thirty (30) lineal feet of lot frontage. Two (2) ornamental trees or two (2) evergreen trees may be used in place of one (1) overstory deciduous tree.

(b) In cases where building facades directly abut the sidewalk, required frontage landscaping shall be deducted from the required point total.

(c) In cases where development frontage landscaping cannot be provided due to site constraints, the zoning administrator may waive the requirement or substitute alternative screening methods for the required landscaping.

(d) Fencing shall be a minimum of three (3) feet in height, and shall be constructed of metal, masonry, stone or equivalent material. Chain link or temporary fencing is prohibited.

Interior Parking Lot Landscaping.

The purpose of interior parking lot landscaping is to improve the appearance of parking lots, provide shade, and improve stormwater infiltration. **All parking lots with twenty (20) or more parking spaces** shall be landscaped in accordance with the following interior parking lot standards.

(a) For new development on sites previously undeveloped or where all improvements have been removed, a minimum of eight percent (8%) of the asphalt or concrete area of the parking lot shall be devoted to interior planting islands, peninsulas, or landscaped strips. For changes to a developed site, a minimum of five percent (5%) of the asphalt or concrete area shall be interior planting islands, peninsulas, or landscaped strips. A planting island shall be located at least every twelve (12) contiguous stalls with no break or alternatively, landscaped strips at least seven (7) feet wide between parking bays.

(b) The primary plant materials shall be shade trees with at least one (1) deciduous canopy tree for every one hundred sixty (160) square feet of required landscaped area. Two (2) ornamental deciduous trees may be substituted for one (1) canopy tree, but ornamental trees shall constitute no more than twenty-five percent (25%) of the required trees. No light poles shall be located within the area of sixty percent (60%) of mature growth from the center of any tree.

(c) Islands may be curbed or may be designed as uncurbed bio-retention areas as part of an approved low impact stormwater management design approved by the Director of Public Works. The ability to maintain these areas over time must be demonstrated. (See Chapter 37, Madison General Ordinances, Erosion and Stormwater Runoff Control.)

Foundation Plantings.

Foundation plantings shall be installed along building facades, except where building facades directly abut the sidewalk, plaza, or other hardscape features. Foundation plantings shall consist primarily of shrubs, perennials, and native grasses. The Zoning Administrator may modify this requirement for development existing prior to the effective date of this ordinance, as long as improvements achieve an equivalent or greater level of landscaping for the site.

Screening Along District Boundaries.

Screening shall be provided along side and rear property boundaries between commercial, mixed use or industrial districts and residential districts. Screening shall consist of a solid wall, solid fence, or hedge with year-round foliage, between six (6) and eight (8) feet in height, except that within the front yard setback area, screening shall not exceed four (4) feet in height. Height of screening shall be measured from natural or approved grade. Berms and retaining walls shall not be used to increase grade relative to screening height.

Screening of Other Site Elements.

The following site elements shall be screened in compatibility with the design elements, materials and colors used elsewhere on the site, as follows:

(a) Refuse Disposal Areas. All developments, except single family and two family developments, shall provide a refuse disposal area. Such area shall be screened on four (4) sides (including a gate for access) by a solid, commercial-grade wood fence, wall, or equivalent material with a minimum height of six (6) feet and not greater than seven (7) feet.

(b) Outdoor Storage Areas. Outdoor storage areas shall be screened from abutting residential uses with a by a building wall or solid, commercial-grade wood fence, wall, year-round hedge, or equivalent material, with a minimum height of six (6) feet and not greater than seven (7) feet. Screening along district boundaries, where present, may provide all or part of the required screening.

(c) Loading Areas. Loading areas shall be screened from abutting residential uses and from street view to the extent feasible by a building wall or solid, commercial-grade wood fence, or equivalent material, with a minimum height of six (6) feet and not greater than seven (7) feet. Screening along district boundaries, where present, may provide all or part of the required screening.

(d) Mechanical Equipment. All rooftop and ground level mechanical equipment and utilities shall be fully screened from view from any street or residential district, as viewed from six (6) feet above ground level. Screening may consist of a building wall or fence and/or landscaping as approved by the Zoning Administrator.

Maintenance.

The owner of the premises is responsible for the watering, maintenance, repair and replacement of all landscaping, fences, and other landscape architectural features on the site. All planting beds shall be kept weed free. Plant material that has died shall be replaced no later than the upcoming June 1.

CITY OF SACRAMENTO
PLANNING AND BUILDING DEPARTMENT

LANDSCAPE REQUIREMENTS: WATER CONSERVATION ORDINANCE/SHADING GUIDELINES

CERTIFICATE OF COMPLIANCE

(For commercial, industrial, office, institutional, multi-family, residential common areas, model homes and city maintained planting areas)

Project Information

Project Name: _____

Project Address: _____

Project Type:

- G Model Home/Multi-Family
- G Commercial/Industrial
- G Park/Landscape Corridor/Common Area
- G Other: _____

Contractor Certification

I/We certify that the landscape planting and irrigation system have been installed in accordance with the approved plans and specifications.

_____

Contractor Signature | Date | State License Number

Landscape Architect/Designer Certification

Landscape Architect/Designer: _____

State License Number: _____

Address: _____

City/State/Zip Code: _____

Telephone #: _____

Email Address: _____

I/We certify that the above referenced project has been substantially installed in accordance with the "Water Conserving Landscape Requirements," and the "Parking Lot Tree Shading Design and Maintenance Guidelines," and that the installed landscape plantings and irrigation system conform to the approved plans and specifications.

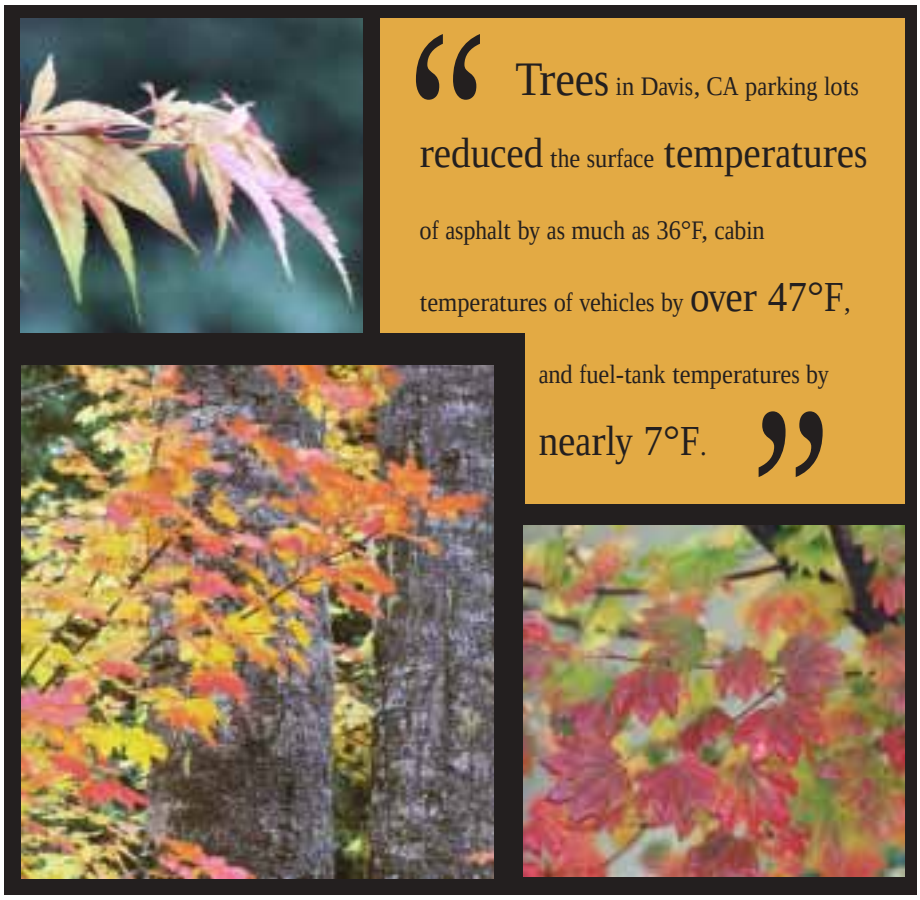
_____

Landscape Architect/Designer Signature or Irrigation Consultant | Date | State License Number

On a hot summer day, would you rather sit down in a nice shady spot or broil unprotected in the blazing sun? Your car feels the same way. And you know how uncomfortable it is to climb back into the driver's seat after it's been baking in the heat. But…

Where are all the cool parking lots?

Center for
Urban Forest Research



> “Trees in Davis, CA parking lots reduced the surface temperatures of asphalt by as much as 36°F, cabin temperatures of vehicles by over 47°F, and fuel-tank temperatures by nearly 7°F.”

WHERE ARE ALL THE COOL PARKING LOTS?

Parking lots occupy about 10% of the land in many of our cities, and since the 1970s energy crisis there has been an increasing interest in parking lot shade ordinances. We chose Sacramento, CA as the test case to investigate how well one “pretty good” ordinance was working.

SHADE FALLS FAR SHORT

The shade required by the Sacramento ordinance is 50% of the total surface of the parking lot. Not one of the lots we surveyed even came close to achieving this target. In fact, the effective shade provided by existing trees was only 8.1%.

After computer “growing” trees to their projected 15-year size, tree shade increased to only 21%. Many of the lots planted with large-statured trees will probably exceed this figure, and, as expected, the lots with crab apple, crape myrtle and pear will never come close.

One interesting finding was that trees in retail lots produced more shade per tree than trees in office or apartment complex lots. A major reason is that retail lots tend to be larger and contain more double-loaded spaces, and their ratio of interior to perimeter trees is greater.

Many other parking lot ordinances specify one tree for a certain number of parking spaces or a certain amount of landscaped area per space rather than the 50% shade rule. However, under these ordinances, trees can be clustered in islands or along the lot perimeter, often resulting in large areas of unshaded pavement.

HOW TO DO

Increasing Effectiveness

First, to get more extensive shade it will be necessary to increase tree numbers, provide more soil volume for tree roots, and provide information to property managers and arborists on tree care practices that increase tree canopy cover.

Second, and perhaps more important, it will be necessary to make key planning decisions prior to starting the retrofitting process.

Proper Planning

- ❒ Avoid double-counting tree shade where tree shade overlaps.
- ❒ Do not allow planting of trees not on the ordinance’s Recommended Tree List. Improve the Tree List if necessary.
- ❒ Be sure crown diameters on parking lot plans correctly reflect crown diameters specified in the Tree List. Correct diameters in the Tree List if necessary.
- ❒ Be sure crown diameters for mature trees are not overstated in the Tree List, thus allowing parking lot plans to reflect more shade than they can actually achieve. Correct if necessary.
- ❒ Follow-up to ensure trees are actually planted, and not removed shortly after planting, especially at sites near store fronts where trees could obstruct signs.
- ❒ Do not allow substitutions after the plans have been approved.
- ❒ Do not allow parking lot ratios to exceed those stipulated in the ordinance.

KEYS TO SUCCESS

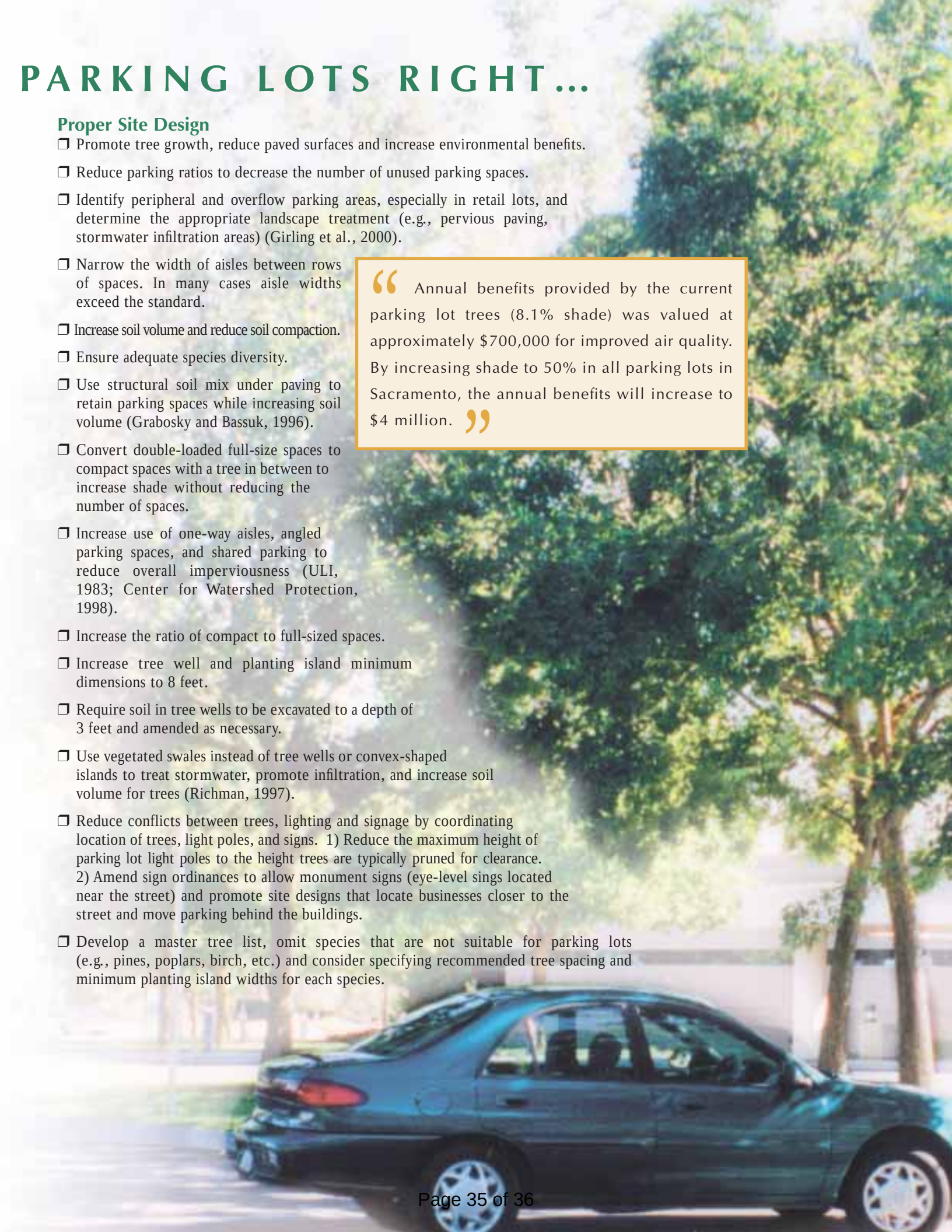
1. Provide planning staff with adequate time and training to review shade plans and parking lot ratios. 2. Require landscape architects to certify that the parking spaces and trees are located as per the ordinance. 3. Teach inspectors how to identify common problems and insist they make systematic and thorough site checks.

PARKING LOTS RIGHT...

Proper Site Design

- ❒ Promote tree growth, reduce paved surfaces and increase environmental benefits.
- ❒ Reduce parking ratios to decrease the number of unused parking spaces.
- ❒ Identify peripheral and overflow parking areas, especially in retail lots, and determine the appropriate landscape treatment (e.g., pervious paving, stormwater infiltration areas) (Girling et al., 2000).
- ❒ Narrow the width of aisles between rows of spaces. In many cases aisle widths exceed the standard.
- ❒ Increase soil volume and reduce soil compaction.
- ❒ Ensure adequate species diversity.
- ❒ Use structural soil mix under paving to retain parking spaces while increasing soil volume (Grabosky and Bassuk, 1996).
- ❒ Convert double-loaded full-size spaces to compact spaces with a tree in between to increase shade without reducing the number of spaces.
- ❒ Increase use of one-way aisles, angled parking spaces, and shared parking to reduce overall imperviousness (ULI, 1983; Center for Watershed Protection, 1998).
- ❒ Increase the ratio of compact to full-sized spaces.
- ❒ Increase tree well and planting island minimum dimensions to 8 feet.
- ❒ Require soil in tree wells to be excavated to a depth of 3 feet and amended as necessary.
- ❒ Use vegetated swales instead of tree wells or convex-shaped islands to treat stormwater, promote infiltration, and increase soil volume for trees (Richman, 1997).
- ❒ Reduce conflicts between trees, lighting and signage by coordinating location of trees, light poles, and signs. 1) Reduce the maximum height of parking lot light poles to the height trees are typically pruned for clearance. 2) Amend sign ordinances to allow monument signs (eye-level sings located near the street) and promote site designs that locate businesses closer to the street and move parking behind the buildings.
- ❒ Develop a master tree list, omit species that are not suitable for parking lots (e.g., pines, poplars, birch, etc.) and consider specifying recommended tree spacing and minimum planting island widths for each species.

> "Annual benefits provided by the current parking lot trees (8.1% shade) was valued at approximately $700,000 for improved air quality. By increasing shade to 50% in all parking lots in Sacramento, the annual benefits will increase to $4 million."



More Information

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HOW TO DO PARKING LOTS RIGHT

After Installation

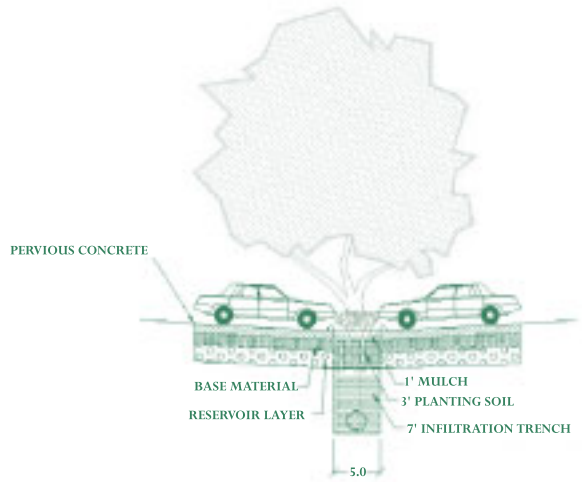
- ❒ Promote adequate tree care after installation to increase tree vigor, crown growth and shade density.
- ❒ Remove stakes as soon as young trees can support themselves.
- ❒ Prune young trees early to train their growth.
- ❒ Allow tree crowns to reach their full potential.
- ❒ Make property owners, managers and arborists aware of shade benefits as well as the benefits of a commitment to professional care on a regular and long-term basis.
- ❒ Enforce the ordinance to ensure that trees are growing at acceptable rates, are properly pruned and watered, and promptly replaced after removal.
- ❒ Require that proper tree care practices are used by qualified professionals.
- ❒ Replace removed trees with trees of equivalent size or value.

Strengthen Ordinances

Develop an enforcement and monitoring program that records information on the management needs of every tree, and results in a letter sent to the property manager requesting corrective action in a specified time.

- ❒ Link inspection fees to the issuance of a building permit.
- ❒ Establish a mechanism to collect fines or place a lien on the property if the owner fails to make the requested improvements.
- ❒ Require interest-bearing bonds to pay for landscape improvements throughout the life of the project.

FILTER STRIP SECTION



Another Benefit

Reducing the amount of impervious surface in parking lots can reduce polluted runoff and the size and costs of stormwater facilities needed to store and treat that runoff. The quantity of pollutants in parking lot runoff is related to vehicular traffic, vehicle condition, and atmospheric deposition. Parking lot runoff has relatively high concentrations of trace metals, oil and grease.

We conduct **research** that demonstrates new ways in which **trees add value** to your community, converting results into **financial** terms to assist you in stimulating more **investment in trees.**