



Arlington's

# TREE DESIGN GUIDELINES

<https://tinyurl.com/ArlingtonTreeDesignGuide>

# NEED FOR STANDARDS

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- Public works projects are designed by architects and engineers with tree planting as a component
- Rarely are arborists, especially municipal arborists, consulted to provide input
- Tree related details are often considered too late in the design process when change is difficult, resulting in poor tree planting even with arborist input

# NEED FOR STANDARDS



- Some COA projects involved landscape architects
- There was rarely input from the City Forester or maintenance personnel
- This disconnect prevents process improvement



# NEED FOR STANDARDS

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- Tree preservation during street reconstruction projects was also an issue
- A Utah State University webinar in September 2018 discussed Seattle's new manual for addressing tree and sidewalk issues
- [https://www.seattle.gov/Documents/Departments/SDOT/Trees/TreeSidewalksOperationsPlan\\_final215.pdf](https://www.seattle.gov/Documents/Departments/SDOT/Trees/TreeSidewalksOperationsPlan_final215.pdf)

## POLL QUESTION 1

- Where do you work?
  - Private sector
  - Non-profit
  - Municipality
  - State

## POLL QUESTION 2

- Which category best describes your work?
  - Design
  - Construction
  - Maintenance
  - Regulation
  - Everything?

# EARLY PROCESS

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- The Forestry and Beautification Division of Parks wanted to develop some standard or guidance concerning tree planting design and provide mitigation options for existing trees
- We had a draft document based on the most common issues encountered for new planting projects but had to determine how to implement standards

# DESIGN CRITERIA MANUAL

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- Arlington's Design Criteria Manual is a city council approved document to instruct engineering projects in the City of Arlington
- Input is provided by:
  - Public Works and Transportation
  - Water Utilities
  - Planning and Development Services
  - Parks and Recreation
  - Fire Department

# DCM GUIDELINES

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- In addition to the council approved manual (i.e. required for plan submittal) there are guidelines ranging from SWPPP to Streetlights
- Some aspects of the guidelines are included in the DCM as required components while the guidelines themselves attempt to provide all the information a project engineer or designer will need





# TREE DESIGN GUIDELINES

Design Criteria Manual  
Published May 2019  
Updated May 2020

## CITY OF ARLINGTON FORESTRY AND BEAUTIFICATION

### TREE DESIGN CRITERIA & GENERAL GUIDELINES

These guidelines are intended to assist planning and design of public improvements in the City of Arlington regarding tree health and longevity of City assets. The information in this document may be consulted regarding designs on private property; however, the City of Arlington makes no warranty express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or use of any information, apparatus, product, or process disclosed. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the City of Arlington. Always defer to applicable Ordinances or Standards regarding design and installation of landscaping.

#### I. **TREE INSTALLATION**

##### A. DESIGN PRINCIPLES

###### 1. Maintenance

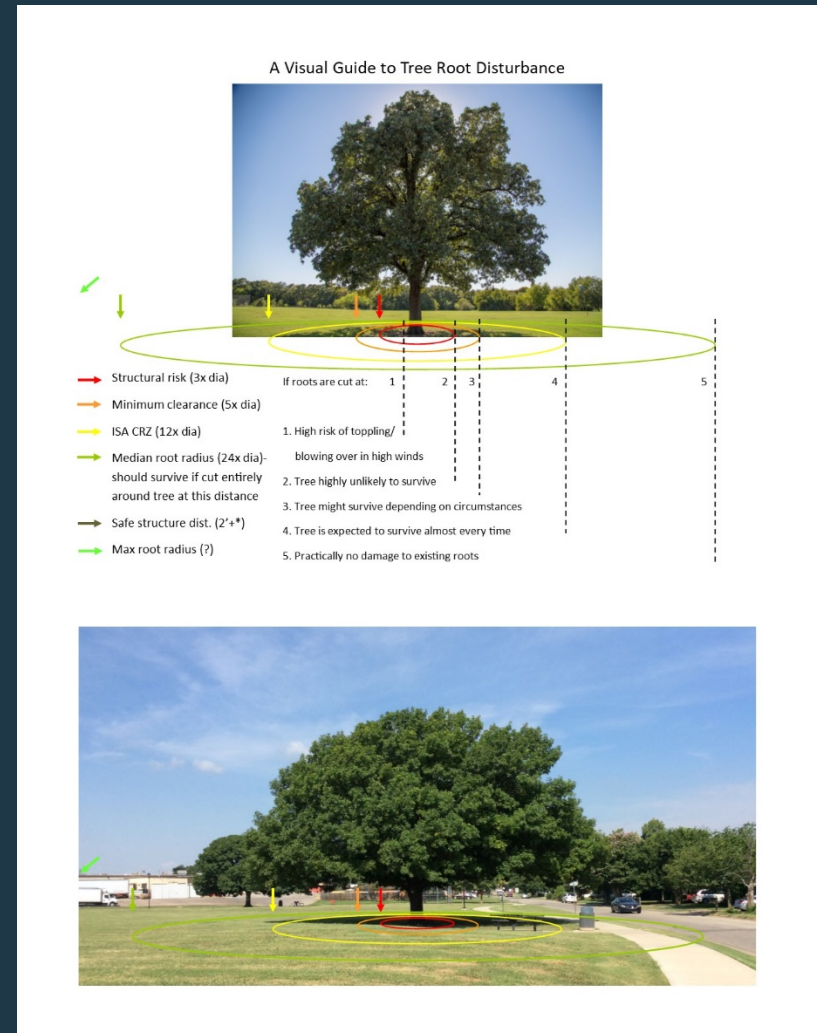
Any proposed tree planting for the City of Arlington should fully consider the enduring maintenance requirements of the proposed design. Typically, maintenance is provided by the Parks and Recreation Department which utilizes staff and outside contractors for maintenance. The Parks and Recreation Department does not readily have the capability to perform the following: road closures, vehicle parking exclusion, pedestrian walkway closures, elevated work above 10 feet, lifting of greater than 80 pounds, work requiring heavy equipment, or work that requires special tools not readily available. Feasibility of daily, weekly, or monthly maintenance needs should be fully considered in the proposed design. For example, tree and landscape beds located adjacent to single lane roadways must allow for parking of maintenance crew vehicles without fully blocking traffic. Vehicles should be provided with adequate space at a reasonable distance on the shoulder, on the sidewalk, or adjacent city property. As another example, tree pit coverings should allow for collection of trash without removal and removal for other maintenance should be feasible for two workers without specialized equipment. For maintenance questions concerning a design please contact the Parks and Recreation Department.

###### 2. Conflicts

Tree installation design should always consider future conflict from growth of the tree. This includes growth of the canopy and trunk as well as growth of the roots. Expected crown width and height should be considered and reasonable clearance from structures should be determined from fully mature trees, not

# WRITING THE GUIDELINES

- Initially our document focused on existing trees and how other departments, such as Public Works, could better protect trees
- This example is a compilation of many sources into a simple graphic representation



# TREE DAMAGE AND PRESERVATION

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- Seattle's Tree and Sidewalk Operation Plan provided many of the details for existing tree protection and mitigation of sidewalk damage
- We tailored our information to Arlington's needs and made sure it was organized for the most common tree issues

# TREE DAMAGE AND PRESERVATION



- Preservation is presented after design in the document, but it was the basis of much of the recommendations for new tree planting



# NEW TREE DESIGN

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- We realized many of the preservation issues could be avoided by better design at the start
- The document focused heavily on how to ideally plant new trees as part of city projects
- Details concerning tree planting came from research and our experiences as we couldn't find a fully compiled tree design document

# TREE INSTALLATION GUIDELINES



- We identified five key topics to address:
  - Maintenance and conflicts
  - Tree pits
  - Soil
  - Spacing and crown width
  - Species selection

# DESIGN PRINCIPLES



- Intended to convey our view on the maintenance and care needed for trees
- Emphasize that maintenance needs will be impacted by the design choices
- This section was also intended to stress that trees and plants grow
- As such there needs to be careful consideration of the long-term impacts



# TREE PITS



- Tree pits are popular and necessary in highly urbanized landscapes
- Nevertheless, trees need soil volume to survive
- Cover materials and protection also need to be considered
- Recessed pits can be used to help control stormwater runoff

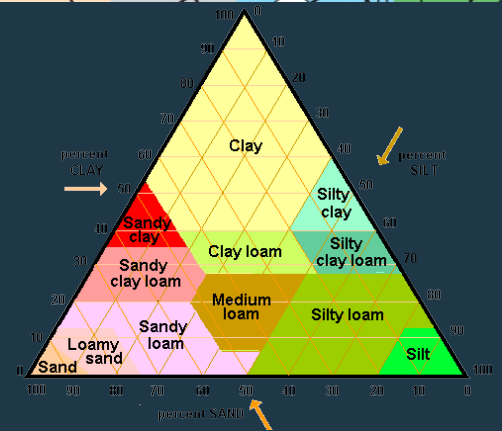
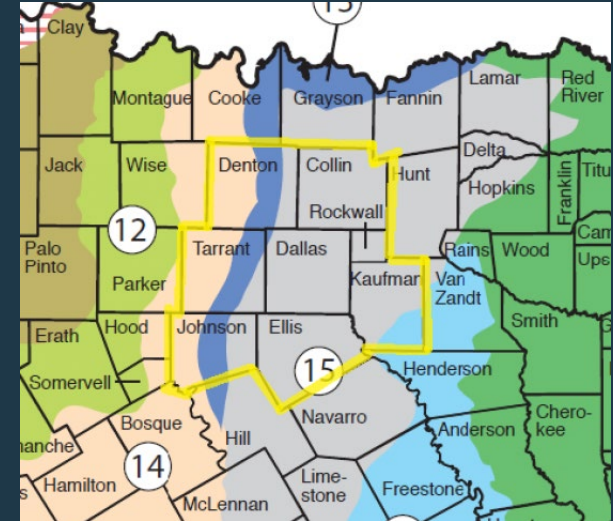




# SOIL



- North Texas soils are diverse
- In Arlington the soil changes dramatically from east to west along the ecoregion boundary
- Tree performance differs dramatically between the two ecoregions and needs to be considered



# SPACING



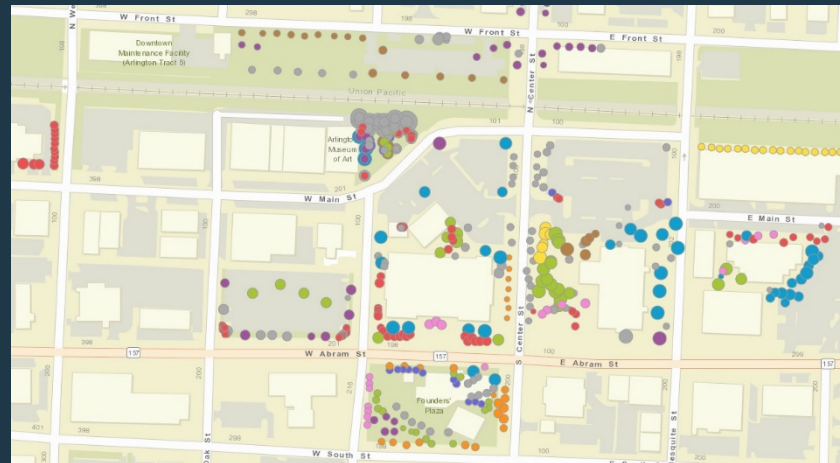
- Overcrowding is common in many older tree plantings
- May be acceptable in cases of high expected mortality
- However, if survival is high, crowded trees need to be removed prematurely
- Trees are also planted too close to buildings, lights, and intersections for their full size



# SPECIES SELECTION



- Diversity in a tree population protects against significant losses from insect and disease threats
- Proper species selection considers the soil, site conditions, and nearby structures to ensure planted trees provide long-term impact



# SPECIES SELECTION

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- We updated our approved tree list for city projects with a new format to better clarify performance
- Within the Approved species we categorized each as Highly Recommended, Recommended, and Acceptable
- We provided each species expected height, width, growth rate, and lifespan
- We also determined if species were tolerant of drought, flooding, and/or clay soils
- This works hand in hand with our guidelines

# FINDINGS



- Concrete facts and figures seem to be well received and easier to follow
- Designers I've spoken with are willing to adjust when they have the information
- Compromises are sometimes necessary to provide for the best long-term tree, such as reducing the number of trees planted

Table 3. Minimum distances for tree planting on medians and right-of-ways. Distance opposite turning vehicle is clearance needed from the stop bar to the closest tree in front of a turning vehicle (see Figure 8 below). This distance is intended to provide NHTSA recommended sight-lines for left-turning vehicles. This distance may not be suitable in all cases. Distance from median end is minimum distance from intersection to tree if there is no turn lane opposite (see Figure 9 below).

SPEED LIMIT (MPH)	NHTSA SAFE VISIBILITY	DISTANCE OPPOSITE TURNING VEHICLE	MINIMUM DISTANCE FROM MEDIAN END
30	335'	123'	15'
40	445'	163'	40'
50	555'	203'	130'
60	665'	245'	200'

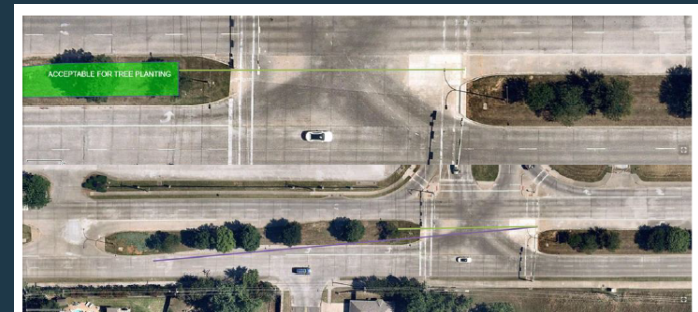


Figure 8. Example of safe distance for tree planting at an intersection with an opposite turn lane. For this 40-mph roadway, distance from the first tree to the opposite stop bar (green line) should be at least 163'. In most cases this will provide the NHTSA recommended visibility (purple line). Please note that light poles or other obstacles may require additional clearance.

# FINAL THOUGHTS



- This was a multiple year process
- The guidelines we provided are for an ideal situation from a tree perspective
- They are still guidelines and merely provide the necessary information, it is up to the designers to implement the best strategy
- Having guidelines is useful with or without arborist plan review
- How useful is not yet known



Jeremy Priest, Certified Arborist- TX-4264A  
Forester  
Arlington Parks and Recreation Department  
817-575-8310 • Fax 214-801-5762  
1924 W Randol Mill Rd • Arlington, TX 76012

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