Transplanting Mature Trees at Dell Medical School

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One of the biggest challenges of my job is to preserve mature trees on construction sites. This is difficult because much of a tree's root area is impacted when developing a site. One method of preservation is to transplant trees to another location either on or off the construction site. For large and more mature trees, this is a huge undertaking that involves heavy equipment, skilled professionals, and much planning and assessment.

A History of Moving Trees at The University of Texas at Austin (UT Austin):

UT Austin has a rich history rooted in its trees. Since the inception of the university, staff and faculty have been committed to preserving and regenerating the urban forest that serves as the university's backdrop. However, campus management has not always put trees on the forefront of building construction and new development projects, which has generated controversy at times. Inherently, trees are an environmentally charged topic, especially in a city like Austin that takes great pride in its natural spaces.

UT Austin has moved almost 50 trees on its campus over the last 20 years, not including the trees recently moved in association with the Dell Medical School. Significant numbers of existing trees have been relocated to make way for projects such as the North End Zone Expansion at DKR Memorial Stadium in 2007 and the Blanton Museum of Art in 2006. The University of Texas System and Board of Regents had the foresight to include the relocation costs of trees into project budgets such as those mentioned above.

The Process of Transplanting Trees at Dell Medical School:

In February 2013, UT Austin Landscape Services was asked to provide an assessment of the trees that might potentially be impacted by the construction of the first stage of the new Medical District. This preservation project would include the existing trees rooted in the following locations: Heman
Sweat Campus (north of the Frank Erwin Center), parking lot 108 (south of the Frank Erwin Center), Penick Allison Tennis Center, Centennial Park, and the Waller Creek riparian zone. Working together with UT Austin’s Campus Planning and Facilities Management staff, and UT System’s Office of Facilities Planning and Construction, trees were assessed based on health, size, proximity to new construction, and supposed capacity ability to be transplanted. Though this process, it was determined that fourteen trees would be relocated to various locations throughout the site of the Dell Medical School.

The process used in the relocation of these trees is fairly new. Environmental Design Inc., the tree transplanting company responsible for this project, calls the patent pending process “Arbor-Lift.” The first step in the preparation process is to root prune the tree to be moved. This is usually done at least 90 days prior to the move and creates limits of the root ball, which will be harvested at the time of transplant. Generally, one can assume that the bigger the tree, the bigger the root ball. During this part of the process, the tree is watered on a very strict schedule and all other necessary tasks (e.g., pruning of dead limbs, removal of excess soil and/or debris from the root flare, monitoring for health issues) are completed at this time. The second step is to wrap the edges of the root ball in burlap and wire cage, similar to that of a balled and burlap tree in the nursery trade. This process helps to support the soil surrounding the roots and is often referred to as “round baling.” Soil is then removed from the area outside of the root ball in order to prepare for the final stage of the process. This final preparation involves driving large metal pipes horizontally underneath the root ball of the tree. These pipes are driven by hydraulic equipment and will support the entire weight of the tree and root ball. One important thing to remember is that these pipes must often go through rock, concrete, abandoned utility pipes, and anything else that may exist under the trees; getting the pipes through to the other side of the root ball is not always easy. Once the pipes are set and bound tightly together, the tree is ready to move.

On other UT Austin tree relocation projects in the past, the trees were lifted up and out of the ground with one or more large cranes, and then placed on heavy-duty trailers in order to be transported to their final destination (or temporary staging area). Rather than this process, the method used at Dell Medical School involves rolling the trees on large round inflatable bags that are placed perpendicularly under each
side of the pipes in order for the root ball to roll across the bags as the tree advances. As the tree passes the last bag, it is pulled out and once again placed in front.

Because monitoring the pressure in the bags is critical, a compressor is pulled along as the tree moves so that Environmental Design staff can assist in the adjustment of pressure as needed. The tree is thus being pushed or pulled by heavy-duty construction equipment, taking special care to push against the pipes and cross beams to minimize damage of the root ball. Whereas past relocation methods resulted in bending and flexing of the root ball, the Arbor-Lift method raises the tree out of the ground by the inflatable bags where it essentially travels to its destination on air. The roots remain intact and soil disturbance is minimized. This method of rolling the trees is usually more time consuming but less costly than renting large cranes; because the Dell Medical School trees were not moving long distances, it proved to be viable option.

The Importance of Preserving These Trees

Preserving mature trees during the urban development process definitely poses challenges. Obviously, it is easier to construct buildings and install utilities on sites where trees are not present. This holds true for landscapers who often find it easier to design entirely new landscapes rather than work around existing and maturing flora. A blank slate makes planning development more efficient, but it is the mature trees in our cities that have helped our ecosystems stand the test of time. Our wildlife, water, and property values have all greatly benefitted from the preservation of mature trees.

Increasingly, it is becoming more evident that our architecture and construction technology is advanced enough that we can now properly erect structures while protecting mature trees. Critics of the process will likely ask if it was worth the money and resources (not to mention the additional stress to the construction schedules) in order to move our UT Austin trees.

The answer is a resounding “yes!” and here are some convincing reasons why:

- Unlike other infrastructure (e.g., buildings, roads, utilities), trees pay us back over time. For example, a study by the US Forest Service from 2007 concluded that the average net benefit of a mature tree on public land is $113 per year. Average yearly benefits only increase with tree size.
- Trees provide vital functions in areas such as watersheds and drainage channels. The City of Portland, for instance, invested $8 million in green infrastructure in order to save $250 million in hard infrastructure costs.
- Mature trees can store 50-100 gallons of water during large rainstorms.
- Mature tree canopy reduces air temperatures by approximately 5-10 degrees Fahrenheit.
- Houston’s regional urban forest saves the city approximately $111.8 million in air conditioning costs and $13.9 million in heating costs annually.
- Patients recovering from surgery in hospital rooms with window views of natural scenes (and trees) had shorter postoperative hospital stays, received fewer negative evaluations in nurses’ notes, and took fewer potent analgesics than those

Figure 2: Tree with pipes installed under root ball, May 2014. Photo by Jim Carse.
patients in similar rooms with windows facing a brick wall

- A recent report released in May of 2014, found that urban forests are directly related to improving human health and decreasing air pollution. The report states that trees in the US helped avoid 670,000 incidences of acute respiratory symptoms and 850 deaths in 2010.

Having the ability to relocate our elderly trees on campus is quite amazing. It is inspiring to know that these trees will continue to benefit our ecosystem and also add a unique aesthetic to the UT Austin Medical District for years to come.

References:

1. Environmental Design Inc. has been in business for over 100 years and is based in Tomball, Texas. Home page, Environmental Design Inc., accessed July 30, 2014, http://www.treemover.com/


4. Dr. James Fazio, “How Trees can Retain Stormwater Runoff” (Arbor Day Foundation, Tree City USA Bulletin 55)


