

## Expanded Abstract:

ISA 2014 annual conference

This presentation will compare growth of two oak species (*Quercus phellos* and *Q. bicolor*) established in a mown grass tree lawn with the same species established in sidewalk using a designed soil installed across the street. Over the past 16 years, tree dimensions have been recorded in a field study in New York City a total of 8 times. Analysis and interpretation has been challenging due to early losses and a series of replacements in the tree lawn, reducing replication from which to easily compare growth and dimension (Grabosky et al. 2002, Grabosky and Bassuk 2008). With the population in the tree lawn becoming stable over several years, individual growth curves for each tree can now be used to compare growth between the trees in the pavement and those in the tree lawn. Consistent with previous research notes in A&UF, there is still no noticeable difference in mean height or DBH between the two sides of the street in the annual census of the tree population. Comparing only the dimensions of the remaining original trees in a non-parametric analysis of median dimensions, it appears that there is still no difference between treatments, although the trees in the lawn now no longer lag behind those in the street. A lack in sensitivity in the comparison which yields no inferential difference in a direct comparison in AOV is due to imbalance and resultant low replication in the tree lawn due to higher mortality in the original cohort. With repeated visits over time, we can now track original and replacement trees as individuals over multiple measurement visits, and then develop a series of growth curves as well as a species/treatment generalized growth curve for comparison by using time since planting rather than observation year.

Quadratic curves adequately describe development of trunk diameter versus time post-transplant for *Q. bicolor* and *Q. phellos* ( $R^2$  of .86 -.94 respectively in sidewalks). We will select direct and estimated measures in the tree lawn for years 10 and 15 post-planting to compare a more complete and balanced data set for more direct comparison between trunk diameter and basal area parameters. We do the same for height. Estimated measures are used in the tree lawn set if observations for a specific tree as replacement shifted the timeline to require interpolation from the preceding-subsequent year measurements, checking for consistency with their individual growth curve trajectory. Canopy closure has occurred in the sidewalk trees in the direction parallel to the street. Also, pruning has been noticed at the sidewalk street edge for vehicle clearances, both as professional pruning and in breakage of branches in isolated cases. Trees in the tree lawn have not experienced the same side pruning and are variably close to neighboring trees, but have not experienced light competition from canopy closure to any meaningful or measurable extent. As such, comparisons for canopy area or volume are not useful. The growth curve analysis and growth trajectory will be discussed. Analysis is on-going and there may be an influence of major reconstruction around the tree lawn for a public park renovation effort adjacent to the planting zone.

Grabosky J and Bassuk N. 2008. Growth of three tree species in designed stone-soil blend under pavement and non-paved lawn in a Brooklyn, New York Streetscape: tenth year data. *Arboriculture & Urban Forestry* 34(4):265-266.

Grabosky J, Bassuk N, Marranca B. 2002. Preliminary findings from measuring street tree shoot growth in two skeletal soil installations compared to tree lawn plantings. *Journal of Arboriculture* 28(2):106-108.