Site Conditions + Tree Growth
Required Maintenance
Potential Damage + Conflicts
Establishment

Water
- Gator Bags
- Contractor responsible the first year
- Homeowners or city in critical locations

Mulch
- Mulched at planting
- Parkways mulched every 4 years

Trimming
- Trees trimmed at planting
- Trimmed again at 3 years
- Then on a 13 year cycle or as needed...responding to complaints
- 2011 Trimming - 7023 trees pruned at an average cost of $65.56
Typical Boulevard Planting
Cutouts

Typical of trees planted in limited right of way areas including downtown and commercial corridors

- Planted in topsoil
- Limited rooting area
- Poor infiltration...low available water
- Slow growth rate
- Raised curb cutout on West 7th Street
- Poor growing location
- Conflict with sidewalk
• Modified cutout on West 7th Street – Saw cut and 4 yards of new soil added
• Expanded root zone and increased infiltration
• 5’ x 12’ +/- openings replace 2’ x 2’

• Open soil bed with mulch
- Snelling Avenue cutouts
- Trees growing in topsoil
Grates are a practical option in tight urban streetscapes

- Common planting method
- Often planted in regular top soils
- Tree selection is crucial for success

- Results are often less than desirable
Grates are a practical option in tight urban streetscapes

- Facilitate tree planting in urban core
- Maximize sidewalk area allowing multiple uses of the pedestrian zone
- Increase accessibility
- Reduce compaction of soils directly around the tree
- Sidewalk design element
...but they require additional maintenance to prevent tree growth conflicts

Common problems include:

- Trunk damage as trees grow
- Debris accumulation
- Siltation and reduced infiltration
- Grate heaving as root flare expands
- Weed growth and deferred maintenance
• Broken and shifting grates that may impact accessibility and sidewalk use
• “Walking trees”
• Limitations on tree growth due to grate conflicts and underlying soil conditions

• Often used with subsurface tree boxes that provide limited soil volumes
**Structural Soils** – CU structural soils are comprised of angular rock, soil, and hydrating gel. Used as a base material for surface paving.

**Payne Avenue project**
- Structural soils installed below pervious pavers
- 8 cubic yards of structural soil/tree
- Increased rooting zone
- Improved tree survival and growth
- Increased ability of trees to provide environmental and economic benefits including stormwater reductions
Structural Soils

Pavers installed over structural soils

Costs

- Materials for structural soils
  - ~ $1,050 per tree
- Materials for a sidewalk grate
  - ~ $2,100 per tree

*Costs exclude the tree and installation*
Structural soils used on West 7th Place pedestrian street

- About 15 years since installation
Elm planted at City Hall

- In for three years
- Receives regular watering
- Swamp White Oak along Kellogg Boulevard in downtown
- Only 1 tree has been replaced since planting in the Spring of 2000
Amsterdam Soil - a structural soil comprised of sand and organic matter

7th Street in downtown Saint Paul

- Reduces compaction in root zone
- Improves infiltration
- Supports tree growth producing larger trees which provide more benefits in the urban environment

Cost similar to select topsoil
- Amsterdam soils used in a narrow boulevard
- Trees at about 10 years after planting
- Another view of these elm trees
- Amsterdam soils used in raised planters
- Irrigated beds on south side of building
Tree Mortality

Newly planted trees
• < 1% in 2011
• 5%-8% in a typical year

In cutouts vs. structural soils
• 25 Years Ago
  • 7-10 year expectancy
• Now
  • 50 years
Questions?

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