

November 14-15, 2012

**PARTNERS IN
COMMUNITY
FORESTRY**

National Conference

Sacramento, California



Concerns, Challenges and Opportunities: Can Utilities and Other Stakeholders Leverage the Benefits of the Urban Forest?

Geoff Kempter,
Asplundh Tree Expert Co.,
Willow Grove, PA



We all agree that trees have enormous value

As community assets

Neighborhood assets

And on individual properties



Today, we can accurately quantify value added by trees

In the past, we simply knew that trees were good



100 Years ago, the
benefits of urban
trees were well
understood

STATE OF MONTANA

Department of Public
Instruction

ARBOR DAY MANUAL

*"A man who plants a tree and cares for it has
added at least his mite to God's Creation."*

State Flower: The Bitter Root;
"Lewisia Rediva"



ARBOR DAY

MAY 14, 1912



1912 Arbor Day Manual

“FACTS ABOUT TREES FOR THE LITTLE ONES”

Aesthetics:

“Cutting down trees spoils the beauty of the landscape...”

Wildlife habitat:

“There are few birds where there are no trees...”

Flood control:

“We might have dangerous floods if we did not have trees...”

“The leaves of trees catch the rain and hold it...”

“...the moisture that should sink into the soil is carried away in the floods.”

Climate change:

Without forests...“we have severe droughts every year.”

“We should have greater extremes of heat and cold if it were not for the trees and forests.”



A Shade Tree Guide

By

ALFRED GASKILL

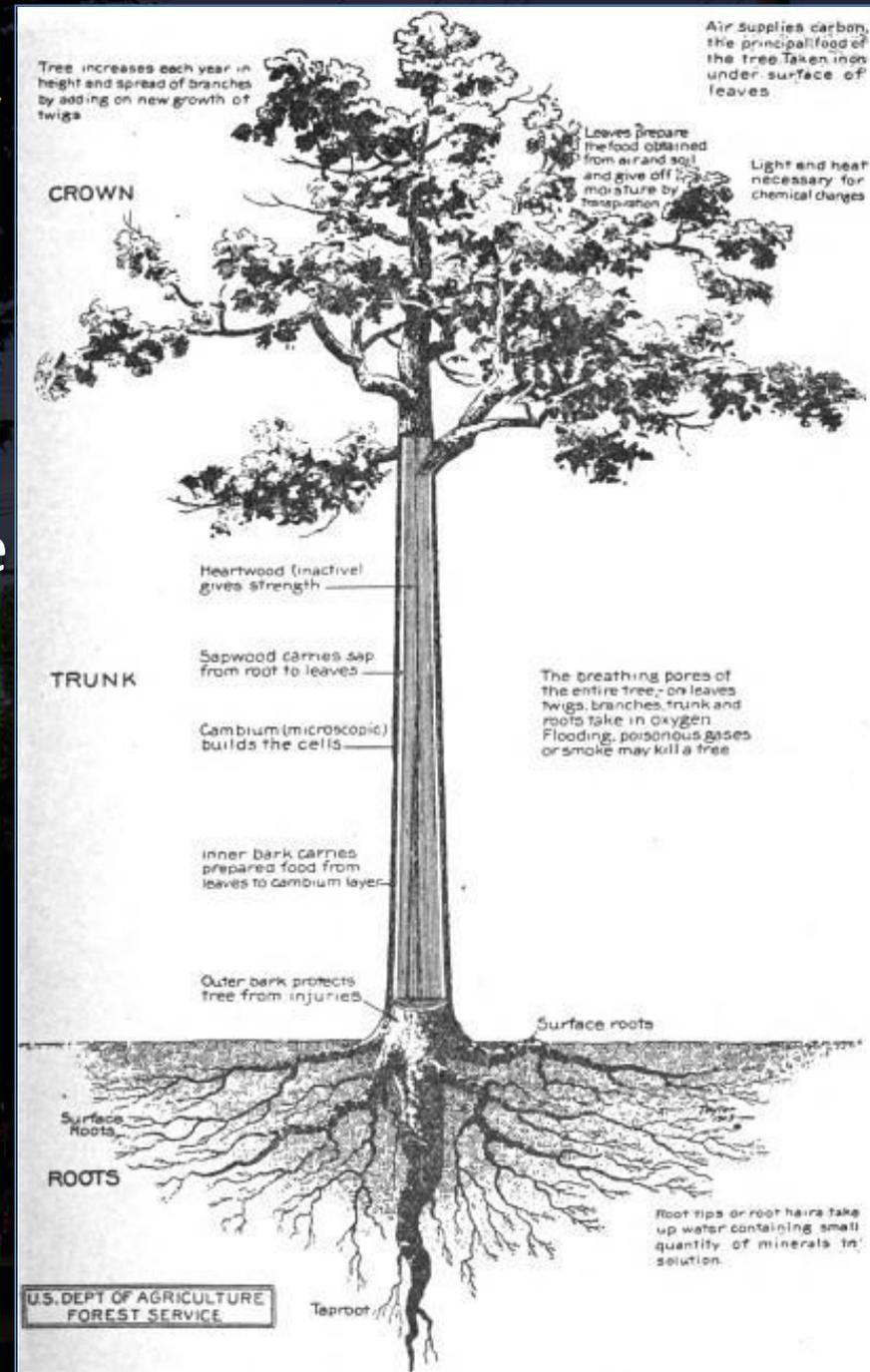
State Forester [New Jersey]

Published May, 1918

Richard Gaskill, New Jersey State Forester (1918)

“... it is now well established that a shade tree has a value beyond that of its wood, or the cost of planting a new one...”

Hard dollar figures were not yet determined, but by 1918 it was “well established” that trees were valuable.



Richard Gaskill, New Jersey State Forester (1918)

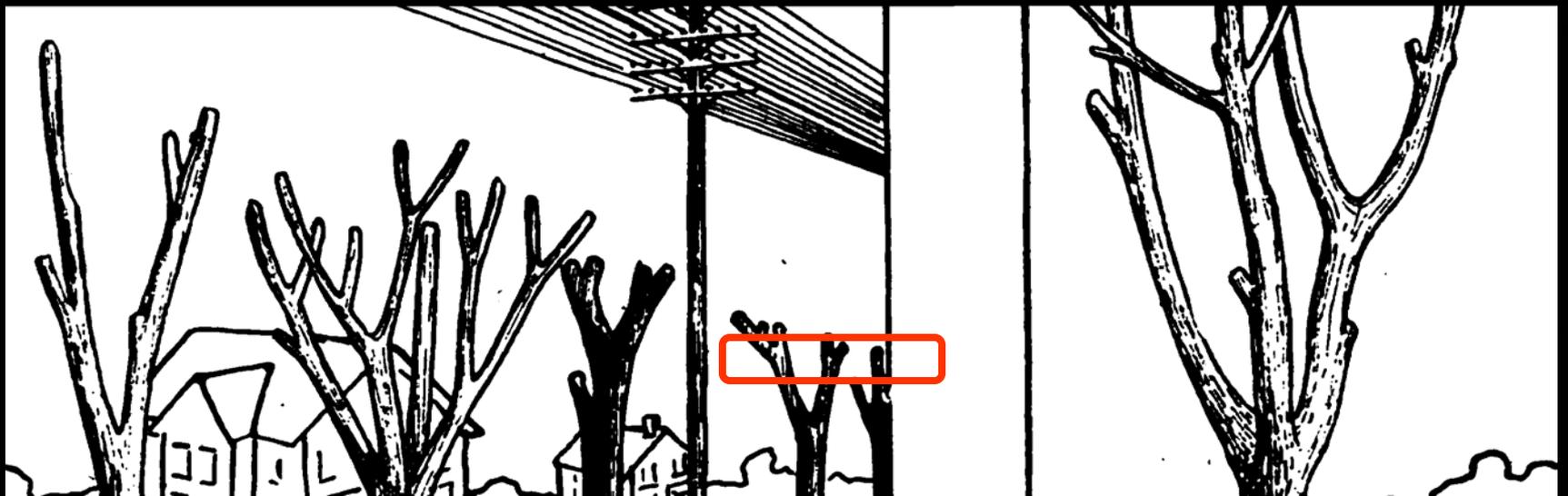
Electricity...“is a necessity of our civilization; the cost of carrying the wires underground is prohibitive except in cities where the service is concentrated; they must therefore be carried on poles along the streets and must be accommodated to existing structures and trees.”

The utilities must “accommodate” the trees – not the other way round.

Richard Gaskill, New Jersey State Forester (1918)

- Trees often suffer from “...the mutilations performed by careless or ignorant linemen.”
- Gaskill also recognized that the cost of underground utility installation is “prohibitive,” an argument still made today.

A Shade Tree Guide by Alfred Gaskill



A Shade Tree Guide

By

ALFRED GASKILL

“Let crossarms and insulators be fastened to strong trees, rather than set poles, where wires can be properly carried...”

A Shade Tree Guide

By

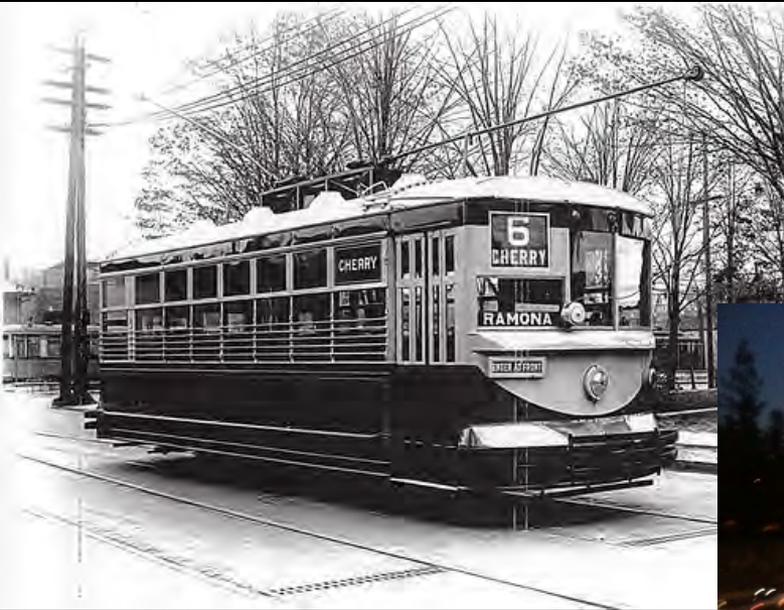
ALFRED GASKILL

“Let crossarms and insulators be fastened to **strong trees**, rather than set poles, where wires can be properly carried...”



Fig. 13. The Same Trees as in Fig. 12, With Crowns Saved and Wires Carried Thru Them in Cables on Low Poles.

1918...1981



Streetcars gave way
to freeways...



Buildings and cars were air-conditioned
City budget priorities changed...



Meanwhile, to feed our ever-growing demand, utilities built a vast infrastructure of power plants, transmission and distribution power lines...



Which came to dominate our urban landscapes



Which came to dominate our urban landscapes



Which came to dominate our urban
landscapes

Electricity was no
longer a luxury – it had
become a necessity



Trees were nice, but...

Given the need for police,
fire, infrastructure
maintenance, sewer
upgrades, citizen services...

Could we afford a to
maintain a luxury like
trees?



1981, Fred Bartenstein, *Journal of Arboriculture*

“...calculations of cost and benefit...can only be educated guesses until more is known about the urban forest and its measurable impact...”

“In the future, the competition for public funds and citizen demand for efficient use of those funds will require urban forest managers to equip themselves with more than guesses.”

The future of urban forestry “will rely less upon new knowledge of how to care for trees than it will upon new knowledge of how trees help to care for people.”

30 years later...

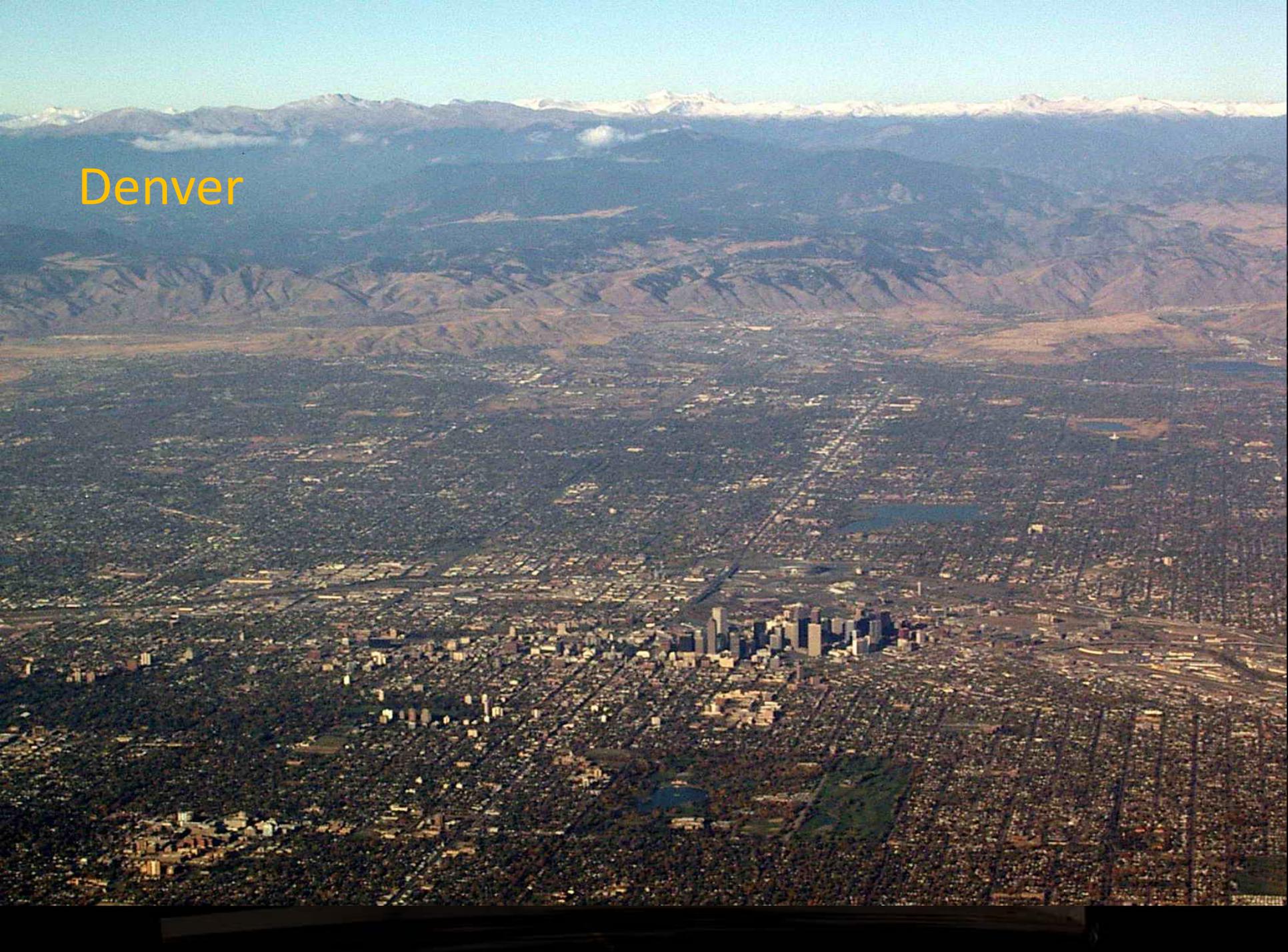
Fred Bartenstein, we heard you!

- McPherson
- Nowak
- Dwyer
- Many more

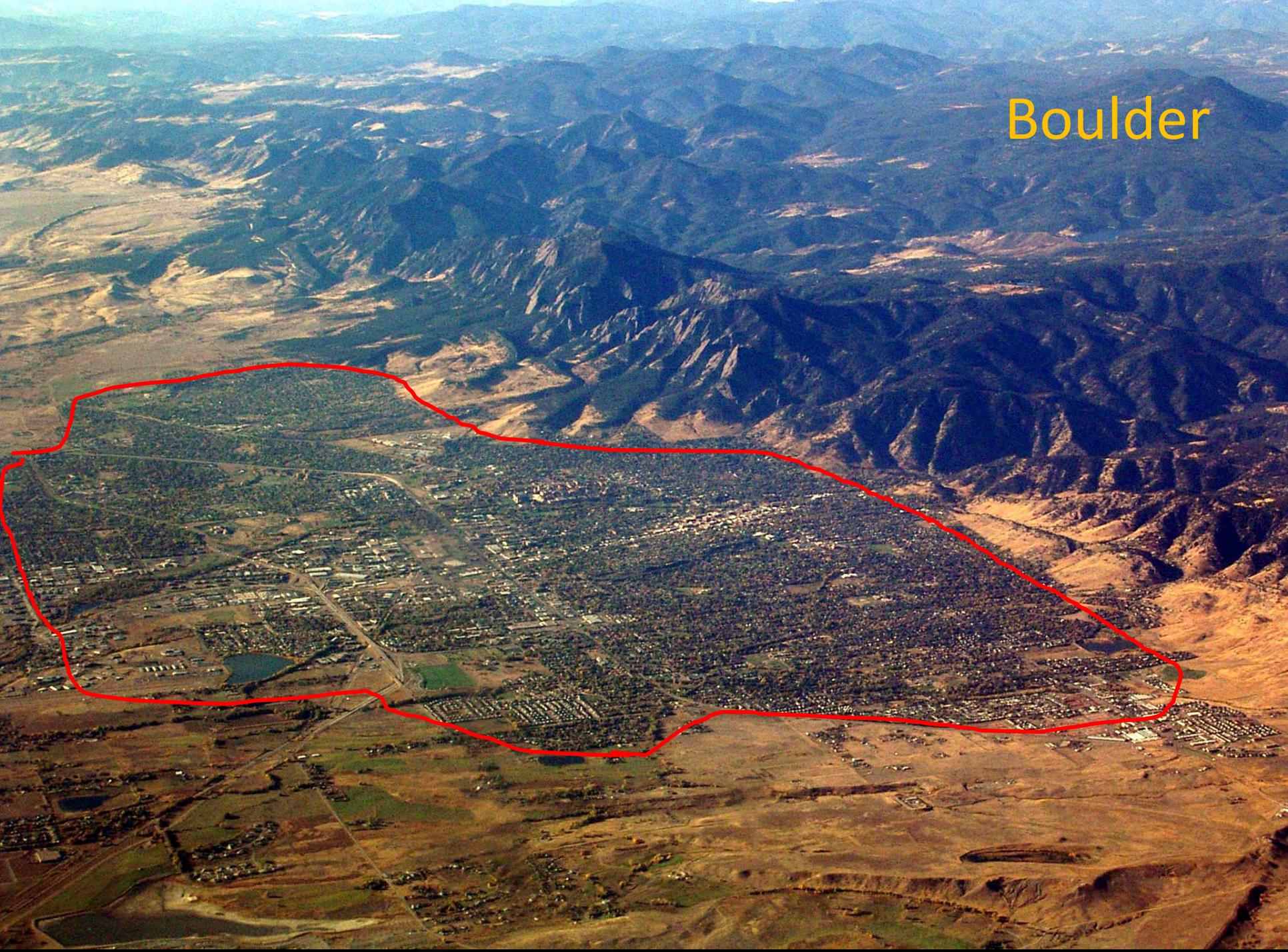


Trees are increasingly recognized by planners and public works professionals as critical infrastructure that requires ongoing care and maintenance.

Denver



Boulder





Sacramento



Sacramento







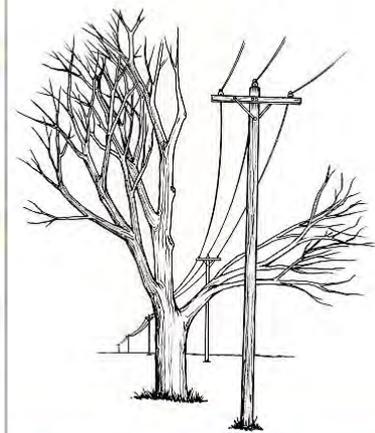




Best Practices Guides

Best Management Practices

UTILITY PRUNING OF TREES



Special companion publication to the ANSI A300 Part 1: Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices, Pruning

Scheduled
for revision

Utility Arborist Association Best Management Practices

Field Guide to Closed Chain of Custody for Herbicides in the Utility Vegetation Management Industry



New

Tree Risk Assessment



Companion publication to the ANSI A300 Part 6: Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices (Tree Risk Assessment & Tree Structure Assessment)

New

Best Management Practices

Best Management Practices

INTEGRATED VEGETATION MANAGEMENT



Best Management Practices

Best Management Practices

Being revised



Trees add value

- Property values
- Air quality
- Carbon sequestration
- Energy conservation
- Stormwater management
- Quality of life



Compare:

- Value of benefits provided by trees and urban forests

To:

- Cost maintaining trees near energized conductors

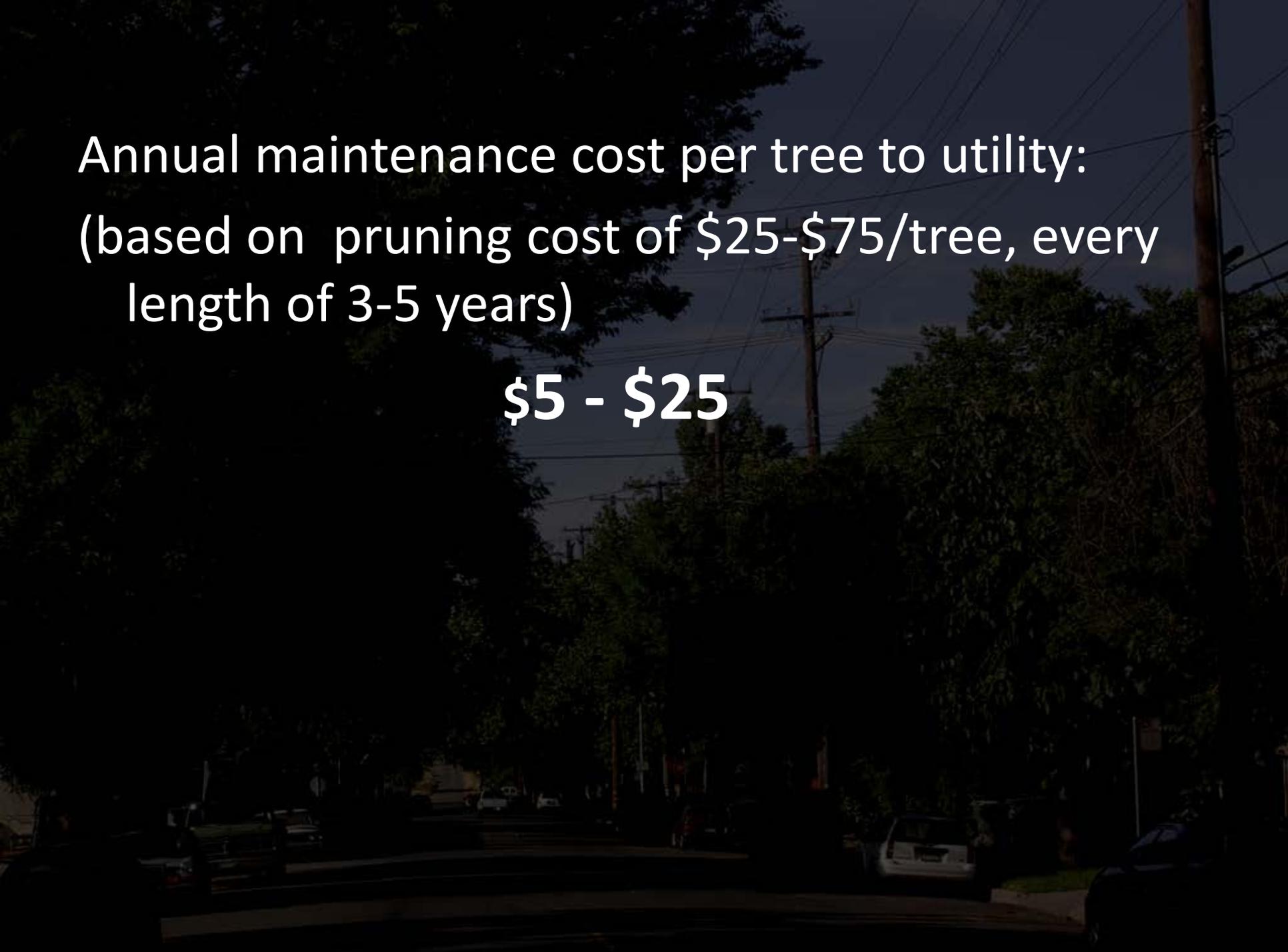


Compare:

- Annual value added of large street tree:
(tax base + cooling effect + carbon sequestration + filtration + stormwater) – (annual maintenance cost to owner)

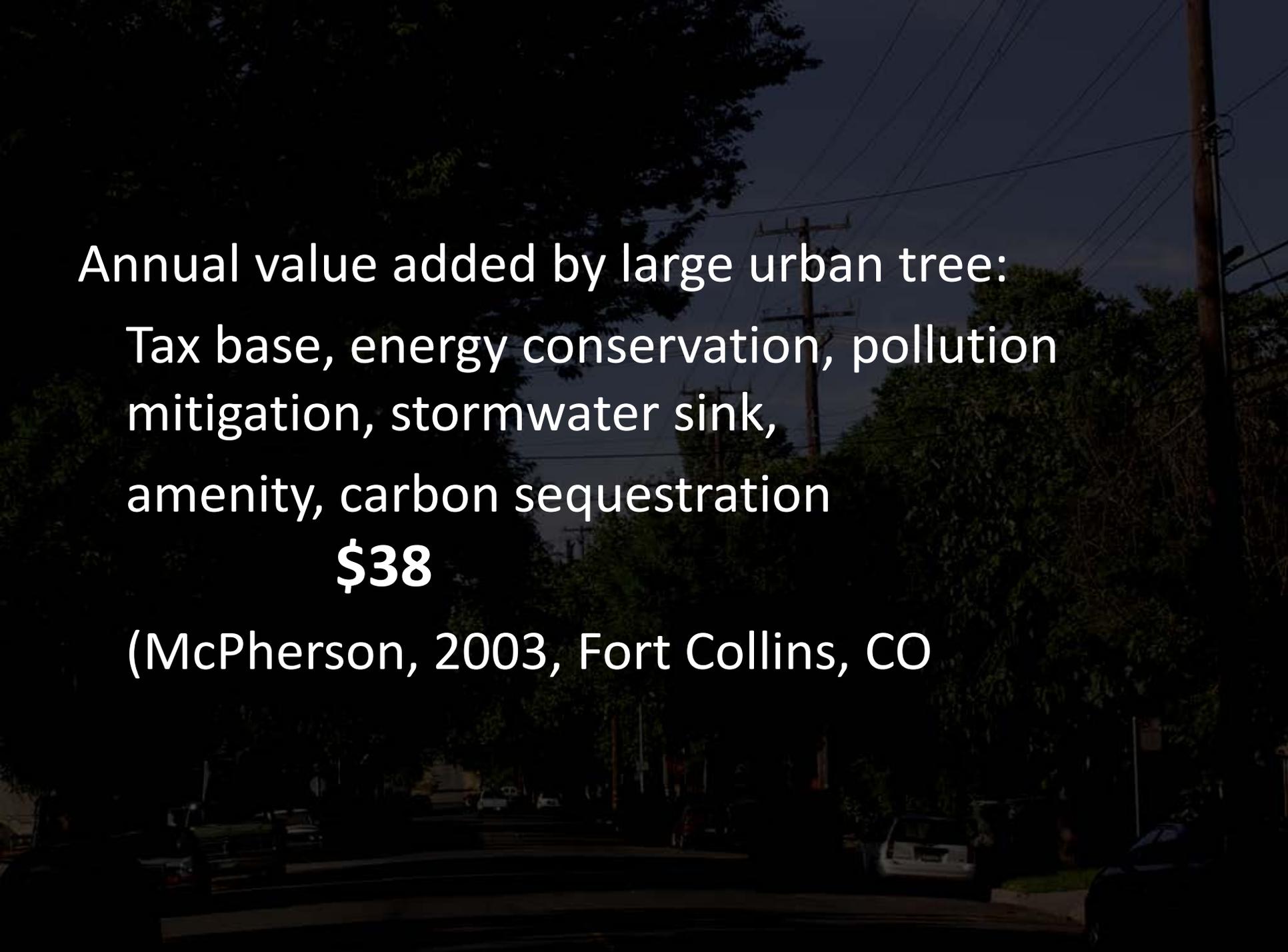
Vs.

- Annual cost of maintenance to utility:
$$\frac{\text{pruning cost/tree}}{\text{cycle length}}$$



Annual maintenance cost per tree to utility:
(based on pruning cost of \$25-\$75/tree, every
length of 3-5 years)

\$5 - \$25



Annual value added by large urban tree:

Tax base, energy conservation, pollution mitigation, stormwater sink, amenity, carbon sequestration

\$38

(McPherson, 2003, Fort Collins, CO)

Annual value added by tree: **\$38**

Annual utility maintenance cost: **\$5 - \$25**

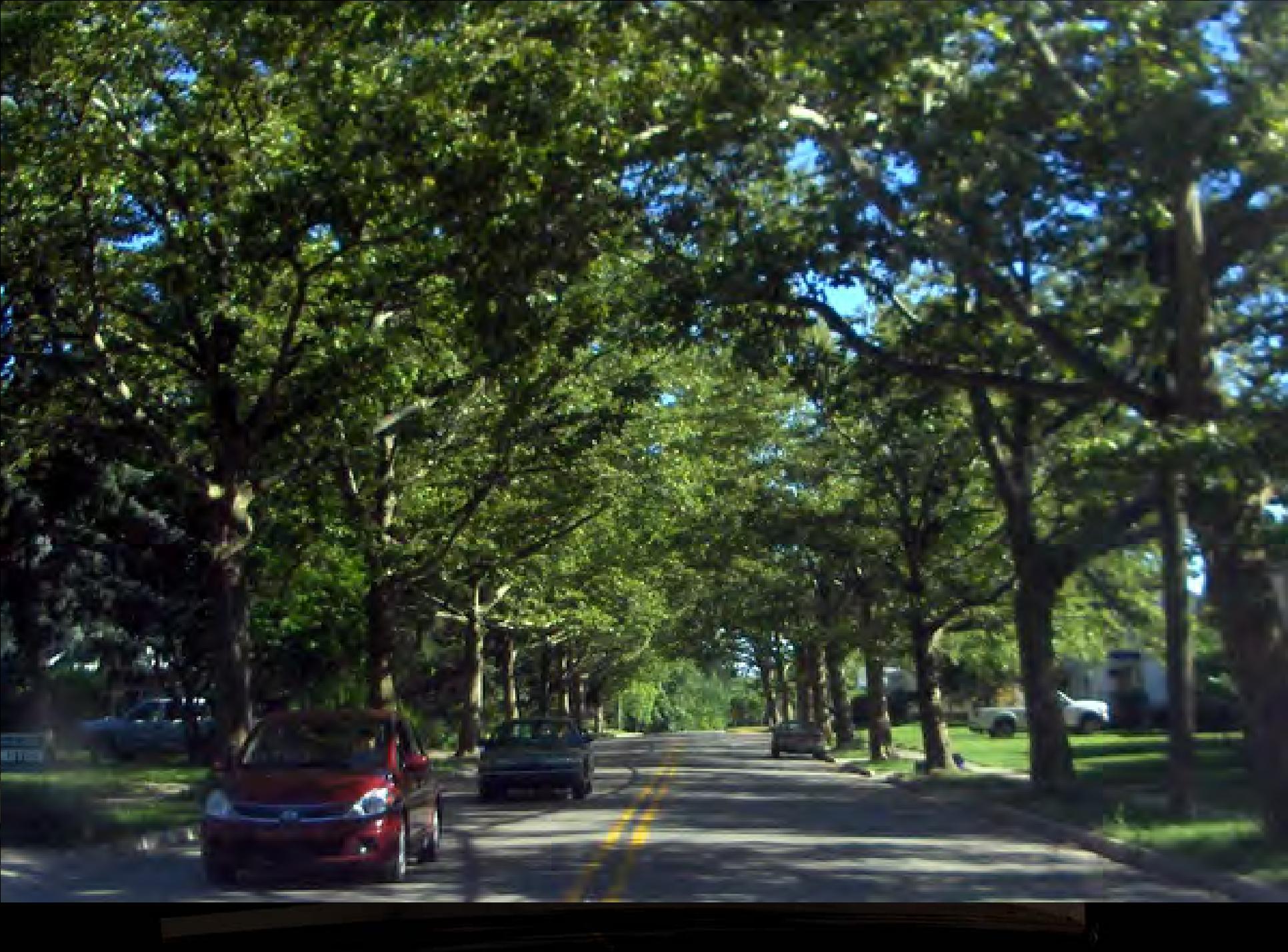
Net annual benefit per tree,
after utility pruning:

\$13 - \$33

Some of these benefits accrue to the utility:

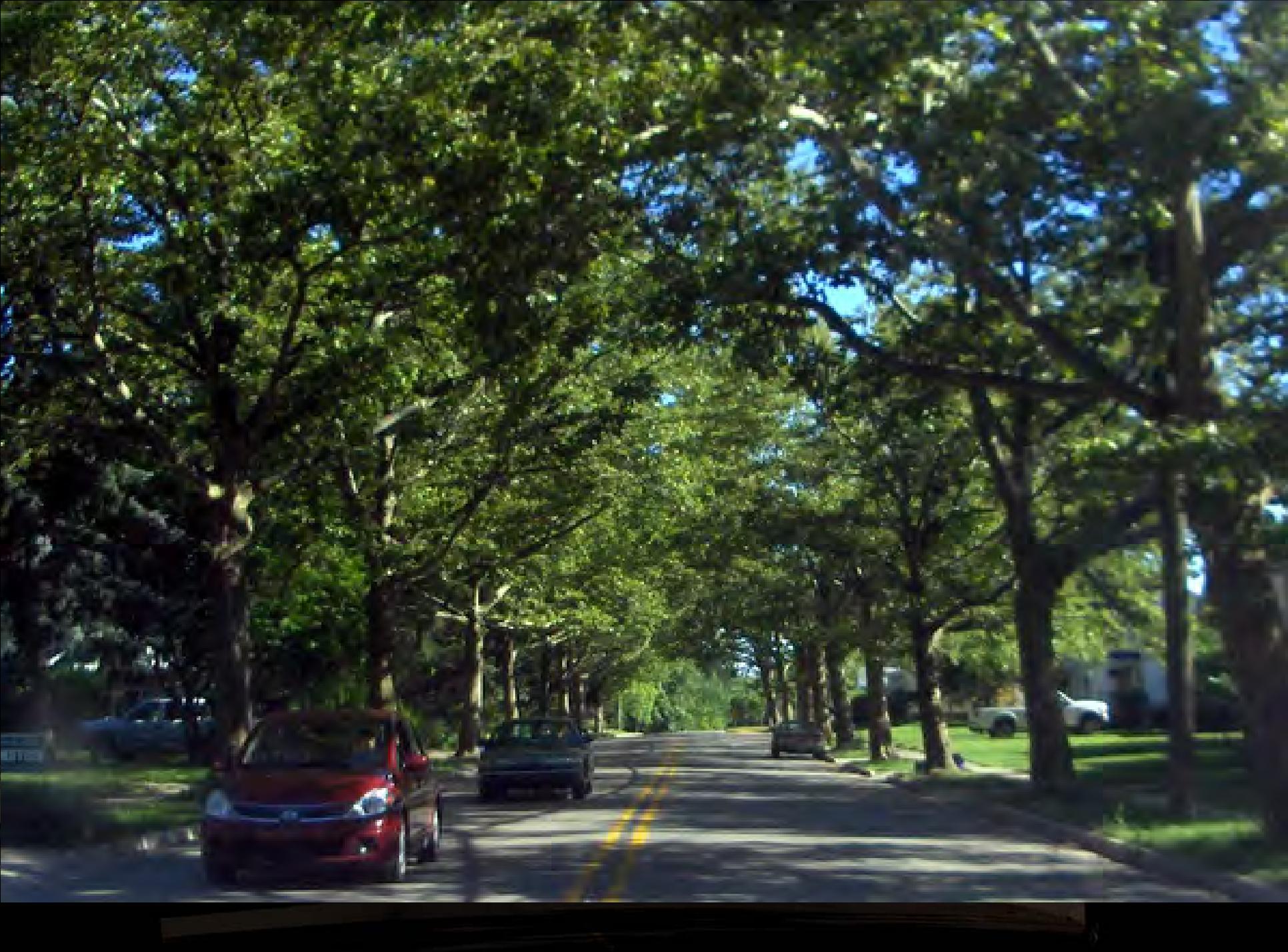
- Urban heat island reduction lowers expensive peak demand
- Filtration reduces particulates emitted from coal generation
- Larger trees capture and store more carbon





Compatible tree shadow





Unknowns

- Cost of interruptions due to retained trees
- Diminished value added by trees pruned for utility clearance
- Condition of existing forest, and susceptibility to failure
- Research is needed!













'Snowmageddon' slams mid-Atlantic; utilities race to restore power

February 7, 2010 7:55 a.m. EST



Hurricane Irene's Wrath: \$7 Billion in Damage



Trees, limbs still hang on power lines following June Derecho storm



Sandy outages unearth debate on burying power lines



Today we face

- A whole generation of trees that has been neglected –
 - Utility pruning, utility construction with no consideration for the benefits provided by the trees
 - Lack of basic care from tree owners
 - Planting
 - Structural pruning
 - Routine maintenance
 - Root cutting
- Which, not surprisingly, fail catastrophically in major storms

Engineered Solutions?



Underground

- Common in
 - new developments
 - high-density urban areas
- Costly to retrofit
- Requires trenching and potential destruction of tree roots



Austin Electric, Austin, TX

Municipally owned electric system, 400,000 meters

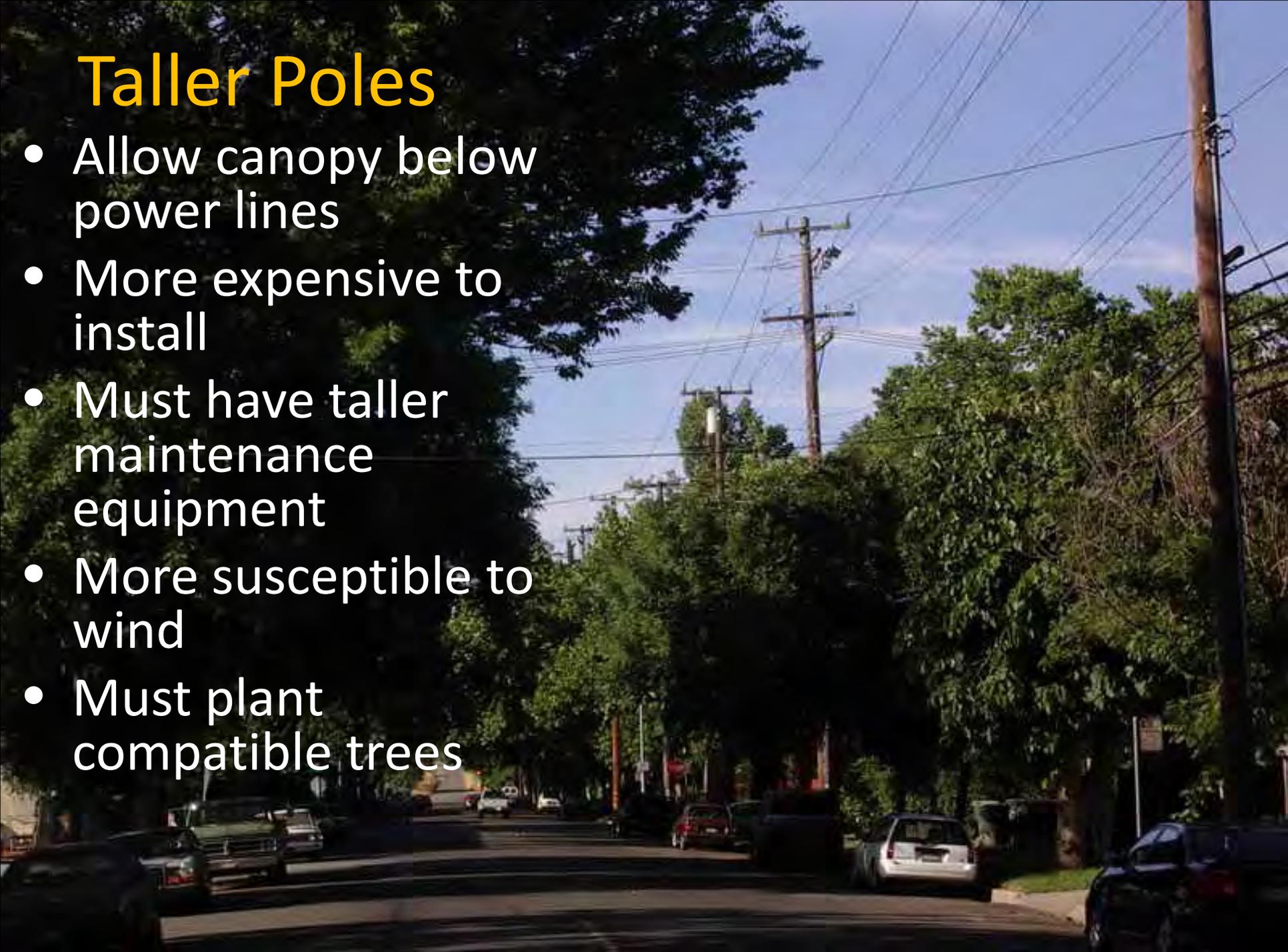
- Recent estimate to replace existing overhead lines with underground lines:

\$3 Billion

- Or \$7500 per customer
- Or \$62.50/month/customer for 10 years
- Austin may use taller poles on some of its heavily treed areas

Taller Poles

- Allow canopy below power lines
- More expensive to install
- Must have taller maintenance equipment
- More susceptible to wind
- Must plant compatible trees



Taller Poles



Taller Poles



Taller Poles

Still must plant compatible trees



Alley Arms

- Partially effective
- Trees will catch up eventually



10 years later...



Other Considerations



Removal / replacement programs

Replace old, heavily pruned trees with compatible trees

- Programs are costly
- Public response is often negative
 - *Perception is loss of big old shade trees, replaced with puny trees*



Small tree removal (replacement?)

- Remove small trees (“brush”) before they get too tall (and expensive, and controversial)
- Offer replacement trees (“right tree right place”)
- Move small specimen trees while it is cost effective

Strategic Tree Planting

E.g. Sacramento Tree Foundation and Sacramento Municipal Utility District (SMUD)

- Plant trees to conserve energy
- Trees are free, but must be cared for by property owners
- SMUD offsets the cost for added generation with this program
- Few utilities have committed to similar programs on a large scale

We often hear the question:

“Do we want canopy trees or reliable power?”

➤ *I believe that if the community wants both, they should be able to have both*

This is what customers want

A photograph of a residential street lined with mature trees in autumn. The trees have dense canopies of yellow and orange leaves, creating a tunnel effect over the road. The trunks are light-colored and lean slightly. In the distance, a car is visible on the road. On the left side of the road, there are several blue recycling bins and a black trash can. The overall scene is peaceful and scenic.

To provide it
safely and
economically
will require
cooperation

Barriers



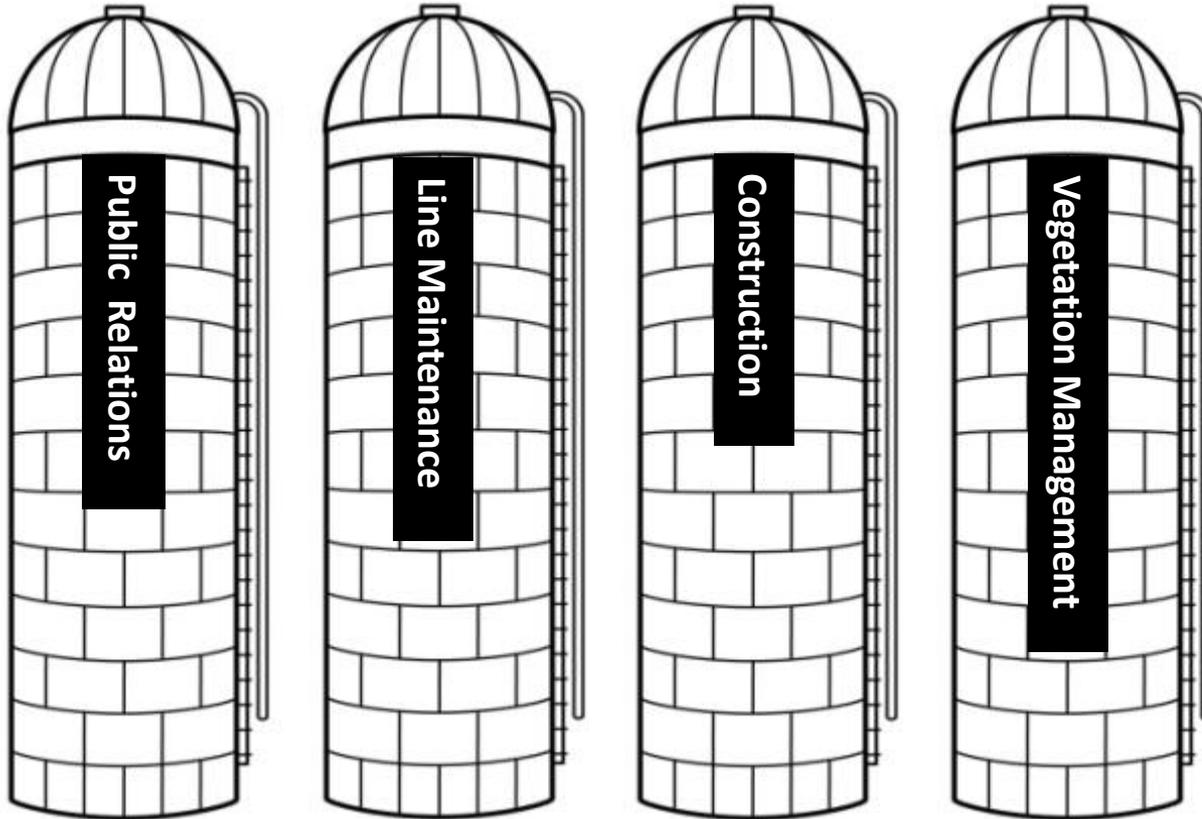
Barriers

Business as Usual

- This is how we did it last time
- This is how we do it here
- That would never work for us
- It's our ROW and we do what we want
- Cutting the roots is less expensive
- We can't afford to maintain street trees

Barriers

Decentralized utility culture leading to “Silo Effect”



...with less consideration for what the public really wants

Barriers

Lack of decision-maker knowledge

“Do not assume decision makers know everything they need to know.”

-Executive at a major investor owned utility

E.g.

- About the feasibility of alternatives
- Long-term cost benefits, including environmental benefits to utilities

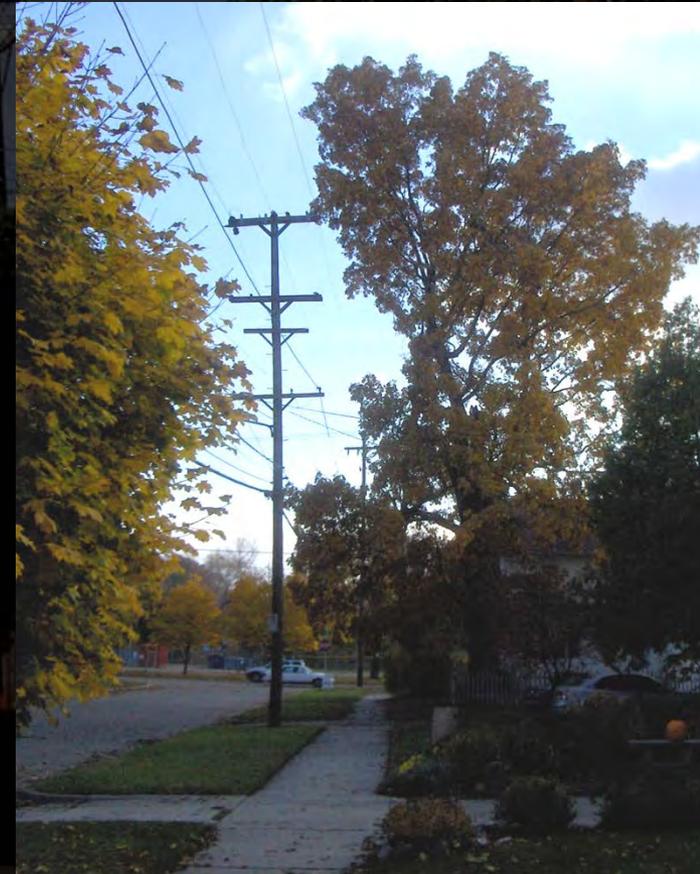
Barriers

Cost

- Initial cost – utility, municipality, developer
 - New program design, consulting etc.
 - Initial implementation
- Ongoing costs
 - Committing to working with stakeholders

Success will require cooperation and communication among all stakeholders

- Utilities provide a public service
- Utility stakeholders are also customers
- Utility ROWs cross millions of properties
- Poorly maintained and monitored trees are more likely to fail catastrophically
- *Management decisions have a profound effect on the urban environment*
- Good stewardship is everyone's responsibility



Conclusion

- Use what we know
 - Best arboricultural practices
 - Create a generation of healthier trees
 - Remove or prune trees before they fail
- Improve communication
- Tear down barriers
 - Regulators
 - Corporate culture
- Seek partnerships
- Fund research

Thanks



