



COLLEGE OF AGRICULTURE & LIFE SCIENCES
Campus Arboretum

Benefits of Urban Trees

TANYA M QUIST, PHD

DIRECTOR, UNIVERSITY OF ARIZONA CAMPUS ARBORETUM |
ASSOCIATE PROFESSOR, SCHOOL OF PLANT SCIENCES |



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Cooperative Extension

Campus Arboretum



➤ Land Grant Mission:

- Extend Research, Education and Outreach to Arizona:
 - Host community educational, tours, workshops & events
 - Work with UA operations to create a model of sustainable landscapes
 - Use technologies & collaborations to improve management & efficiency
 - Provide formal instruction & student engagement opportunities

Outline

- **Trees Benefits**
 - Economic
 - Environmental
 - Community
- **Urban Forestry Needs**
 - Consistency
 - Planning
 - Planting
 - Maintenance



Tucson Context



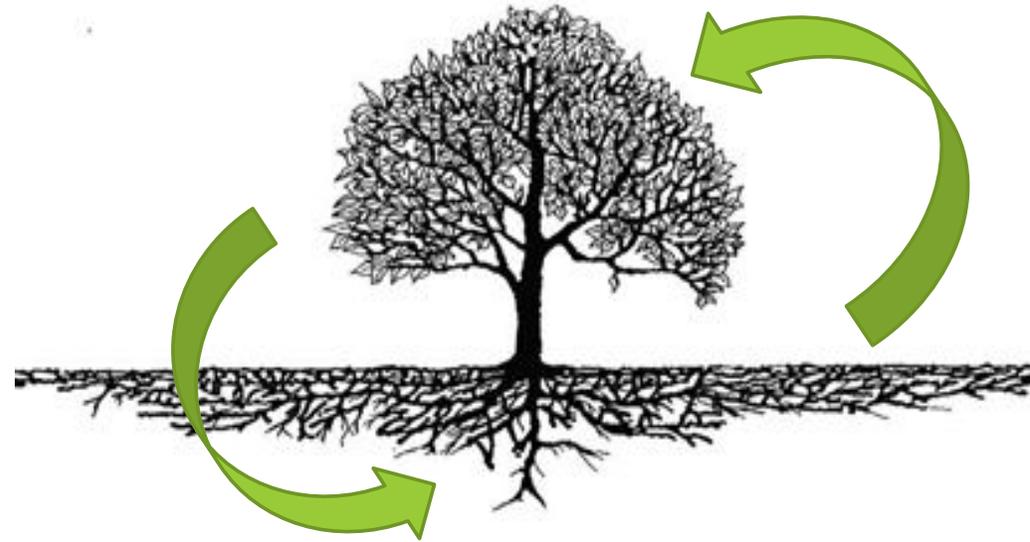
- **Vibrant City and Urban Forest Report 2011:**
 - *Trees are “the most important component of an urban ecosystem needed to assure its viability”*
- **Water Harvesting Ordinance**
- **Plan Tucson Ch. 3 Green Infrastructure 2013**
- **Proposition 407 Parks and Connections**
- **Green Stormwater Infrastructure Proposal**

Benefits of Trees

- Essential part of green infrastructure.
- Serve as conventional grey infrastructure
- Also simultaneously address:



- Environment
- Economy
- Community





Environmental Benefits of Trees



Trees Protect Natural Resources

- ✓ Support wildlife populations and promote biodiversity
- ✓ Intercept storm water and reduce flooding
- ✓ Filter water – protect and improve water quality
- ✓ Clean air - absorb and filter pollutants
- ✓ Detoxify soil – remove heavy metals from sewage
- ✓ Evaporative cooling – reduce temperature
- ✓ Reduce greenhouse gases

Economic Benefits of Trees

Trees are good for business:

- ✓ Increase residential property value
- ✓ Reduce time on market
- ✓ Boost commercial district activity
- ✓ Increase retail business 9-12%
 - ✓ *Biophilic Store Design*
- ✓ Expand consumer market
- ✓ Supply fuel, fiber and food products



2%	Mature yard trees (9" DBH)
3%	Large street trees
3-5%	Trees in front yard landscape
6-9%	Good tree cover in neighborhood
10-15%	Mature trees in high-income neighborhood



Economic Benefits of Trees

Trees reduce costs and pay us back

- ✓ Reduce Urban heat island effect and support climate adaptation:
 - ✓ Reduce average summer temperatures in Phoenix 4-8F with canopy increase 10-25%
- ✓ Reduce energy use 5% by strategic shading, windblocking and evaporative cooling
- ✓ Reduce UV light damage to road sealers – reducing road maintenance needs
- ✓ Reduce demand on traditional grey infrastructure
- ✓ USFS i-tree streets measures \$ value of ecosystem services (benefits) to guide investment priorities

Each \$1 invested in **planting and maintenance** in 5 major cities, ROI of \$1.37 - \$3.09 in benefits

Each \$1 on tree **maintenance** in CA yielded a 580% ROI



Community Benefits of Trees



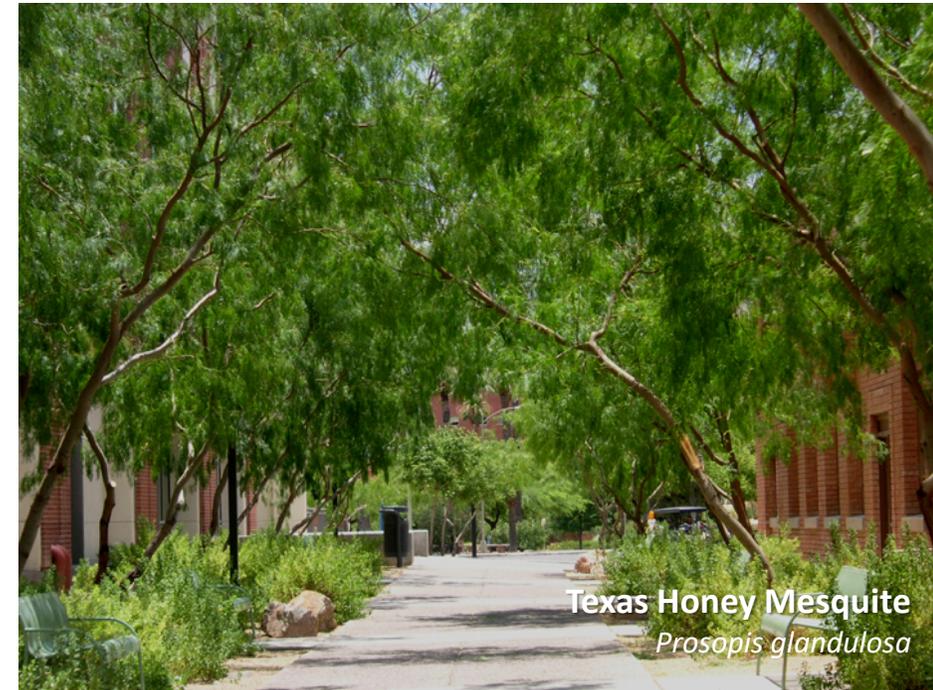
Trees Support Health:

- Increase memory, attention and positive emotion
- Decrease activity in brain parts linked to mental disorders
- Create calm – effect linked to reduce crime
- Healing – green view doubles recovery
- Lower blood pressure, feel younger and richer!

Community Benefits of Trees

Community connection and revitalization:

- Promote physical activity, reduce mortality
- Reduce crime and create safe spaces to gather
- Strengthen community engagement
- Revitalize neighborhoods and life satisfaction
- Provide a sense of place and belonging





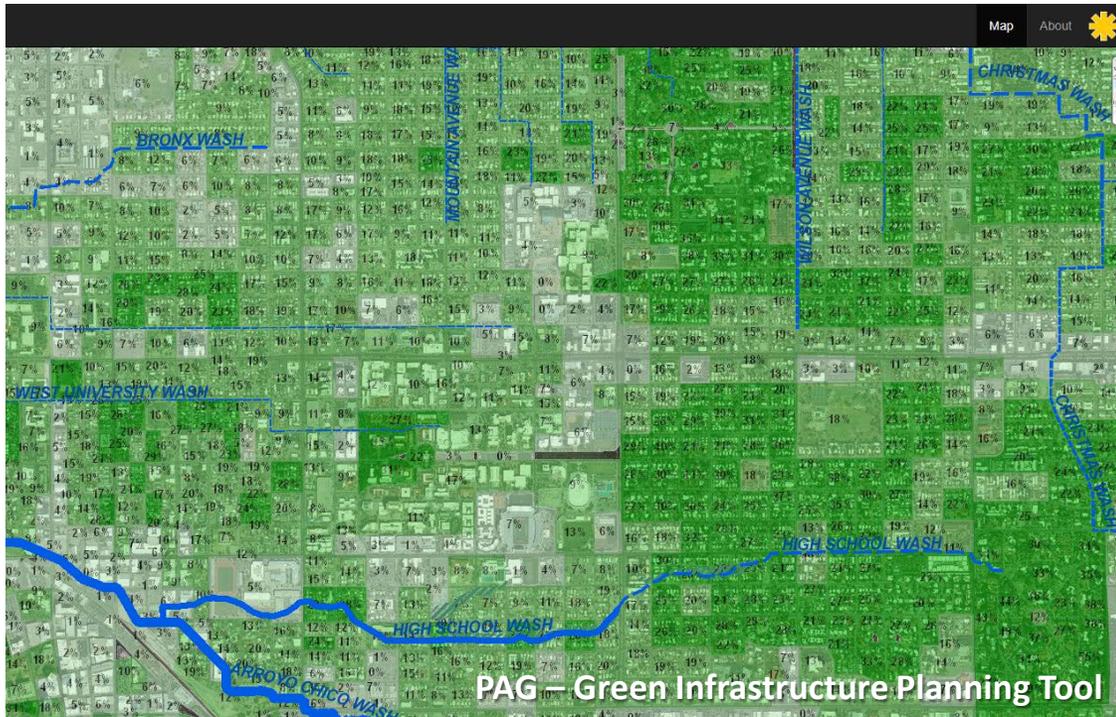
Sustaining Benefits

Healthy trees provide exceptional ROI:

Keys:

- Planning** – data and expertise to get the right tree in right place
 - Planting** – consistent effort and appropriate planting practices
 - Maintenance** – sustainable practices that reduce inputs and maximize outputs
- 

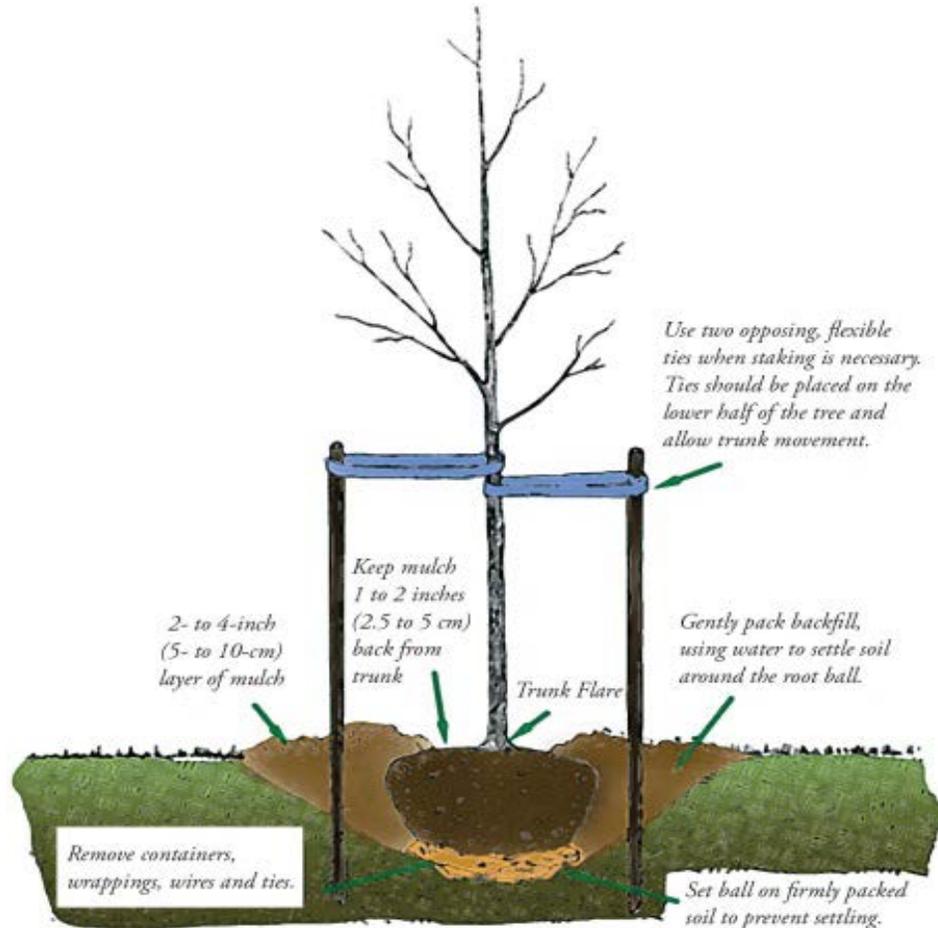
Sustaining Benefits - Planning



- Determining location needs and prioritizing
 - PAG Green Infrastructure Planning tool
- Assessing local site conditions
 - Predicting canopy clearance, utility conflicts etc.
- Plant selection
 - Define criteria and match the right plant for the right place
 - Allow adequate space
 - Respect native diversity
 - Consider microclimates

Sustaining Benefits - Planting

- ISA guidelines for planting techniques reduce tree losses
- Most trees fail when planted too deep!



ISA
International Society of **Arboriculture**



Street Tree Mortality

The benefits of tree planting programs depends on tree survival.

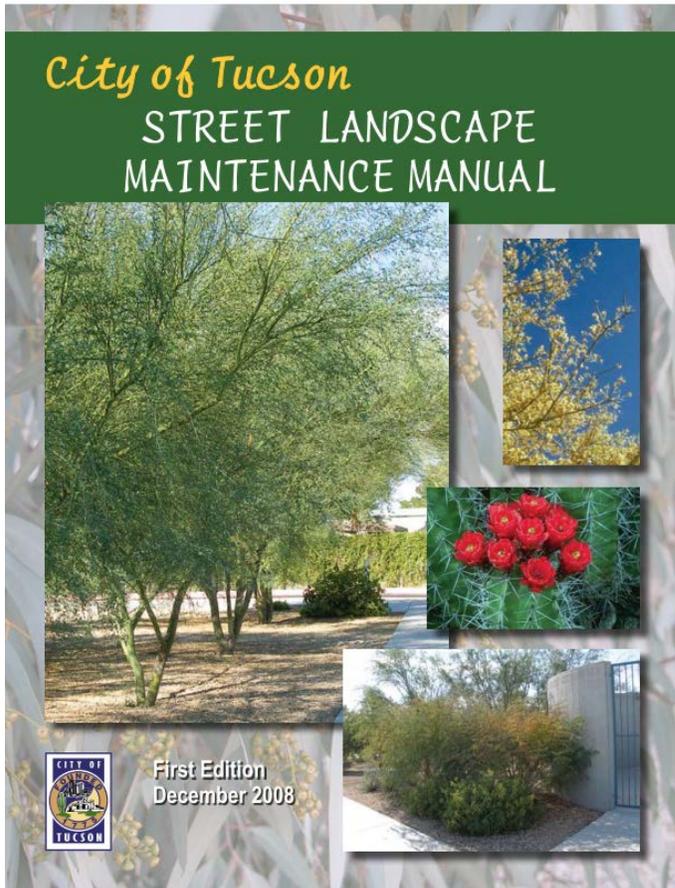


Average lifespan of trees in different land uses based on surveys of managers in 20 US cities is

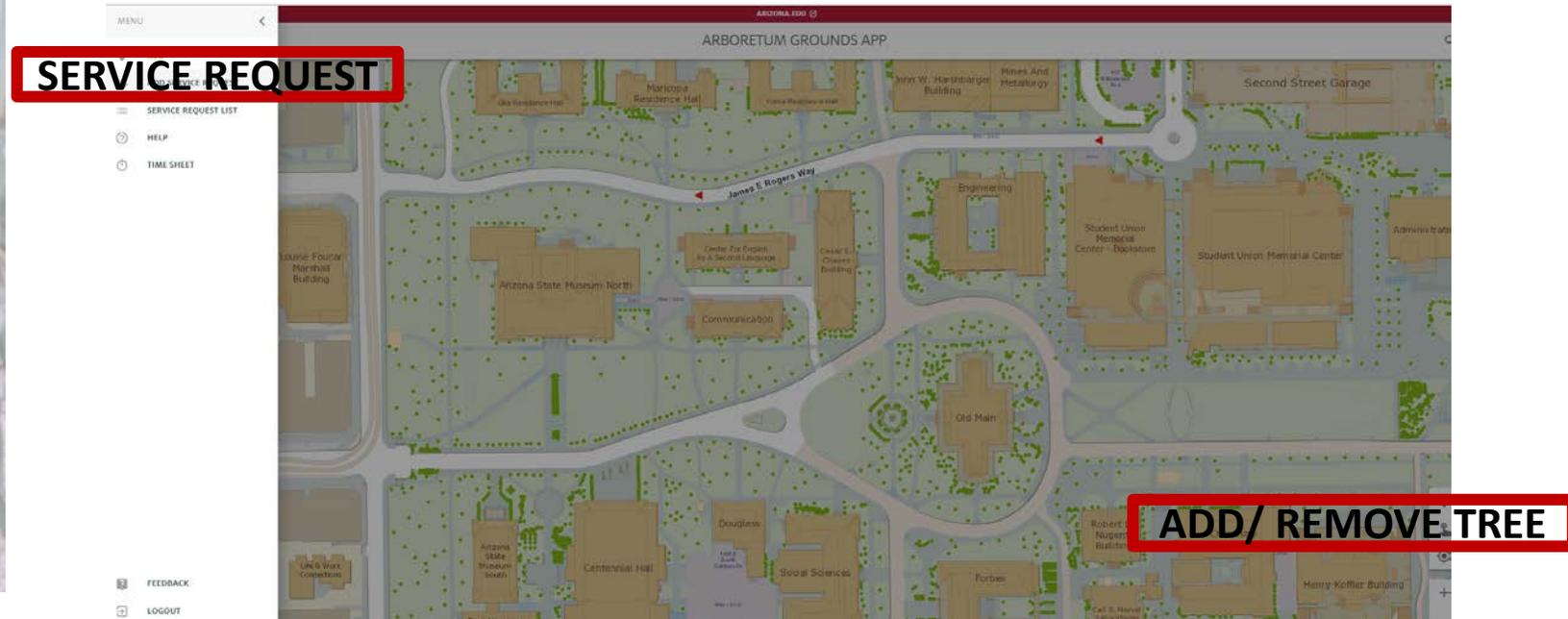
- ❑ 13 years for downtown street trees
- ❑ 37 years for residential sites,
- ❑ 60 years for the best city sites,
- ❑ 150 years for rural sites.

*Skiera, B. and G. Moll. 1992.
The sad state of city trees.
Amer. Forests Mar./Apr.: 61-64.*

Sustaining Benefits - Maintenance



- Tucson's Community Landscape Maintenance Standards and Practices
- Need to keep records, track survival, canopy



Sustainable Management

Cost Savings AND Greater Benefits



Outputs



Inputs



OR

OR

Blue Palo Verde
Parkinsonia florida
© az plant lady



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Tanya M. Quist, Director

QUESTIONS?

tquist@email.arizona.edu

<https://arboretum.arizona.edu/>



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Key Points in Sustaining Benefits

- ✓ Urban trees are essential to green infrastructure
 - ✓ Trees provide significant direct economic, environmental and social benefits
 - ✓ Greater benefits and positive ROI with more canopy and healthy trees
 - ✓ Sustainable urban forests need dedicated funding, leadership and skillful practitioners who:
 - ✓ **Plan adequately**
 - ✓ **Plant properly**
 - ✓ **Maintain responsibly**
- **Green Stormwater Infrastructure Proposal**