Constructing the Urban Forest

OVERVIEW

- The FACTS
- Policies, Codes, Standards, and Guidelines
- Enforcement Mechanisms

Today

Tomorrow
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Population vs Open Space

Phoenix 1.5 M+
Tucson 0.5M+
Mesa 464,704
Gilbert 239,277
Glendale 237,517
Scottsdale 230,512
Tempe 172,816
Peoria 166,934
Surprise 126,275
Avondale 79,646
Flagstaff 68,785
Buckeye 59,470
Prescott 40,958
Sun City 38,622
Queen Creek 32,236
Payson 15,245
Paradise Valley 13,663

City Planner Ratios

Phoenix 1/150,000 pop.
Surprise 1/42,092 pop.
Avondale 1/39,823 pop.
2030 VISION

Achieve an average 25% canopy coverage in Phoenix.
ACHIEVING THE VISION

Section 1: Raise Awareness (Educate)
Section 2: Preserve, Protect, Increase
Section 3: Sustainable, Maintainable Infrastructure
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The FACTS

- Trees are not being planted or replanted at the same rate as they are being removed
  - 3900 Removed/3700 Planted = Net gain 95%
  - National Average for Tree Plantings - $7.65/capita
  - Phoenix - $3.48/capita

- Return on investment (ROI) in Arizona of $2.23 for every $1 invested

- Design, Planting, and Maintenance practices
  - Dead, Dying, or Safety Issues

- Average Life Span of an Urban Tree – 7 Years
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The FACTS

Design Installation Maintenance
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The FACTS

➤ Technical Know-How and Knowledge (Science)
  • Horticulturists, Botanists, Arborists, Agronomists, Foresters, Landscape Architects
  • Plant Nurseries, Landscape Contractors, Landscape Maintenance

➤ Human Needs and Desires
  • Environment, Physical, Emotional, Economical
  • Health, Safety, Welfare
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The FACTS
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The Decision Makers

Citizens

Elected Officials

Appointed Officials

Management/Administration

Professionals

Development/Business

MARKET

QUALITY OF LIFE
POLICY DEVELOPMENT & ENFORCEMENT

- Statutes, Laws, Policies, and Ordinances
  - Legislative Governments – Local, State, Federal
  - Elected and Appointed Officials
  - Planners, Attorneys
  - Technical Professionals
  - Developers, Homebuilders
  - CITIZENS = CITIZEN POWER
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Policy vs Regulatory

Vision

General Plans
↓
Master Plans
↓
Specific Plans
↓
Guidelines

CODIFICATION

Implementation

City Code
Zoning Ordinance
Standards

Resolution – States a position or policy of a city; limited duration

Ordinance – Local Law that regulations persons or property; long-term
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Policy vs Regulatory

AZ Revised Statutes, Title 9 Cities and Towns

Resolution

• limited duration
• The adoption or readoption of the general plan or any amendment to such plan shall be by resolution of the governing body of the municipality,

Ordinance

• broad applicability, significant impact and an extended duration (long-term)
• not inconsistent or in conflict with the laws of this state
• the legislative body of any municipality by ordinance may in order to conserve and promote the public health, safety and general welfare
• Provide for a fine or other penalty or establish a rule or regulation in which a fine or other penalty is imposed for violations

Decision should be based on the intended duration and impact of the proposed action
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The Ordinance
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The Development Process
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The Development Process
Constructing the Urban Forest
The Development Process

Concept A

Concept B
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The Development Process

Proposed Stipulations
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- Enforcement
- Culture
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QUALITY OF LIFE
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- Overlay district, master plans, variances, stipulations, policy documents.

- Salvage or protect in place 4” caliper & cacti 3’ and taller, native and non-native.
  - Common to make case to destroy.

- Minimum caliper sizes for new trees are 1”, 2”, 3”, & 4” depending on the zoning district, 20-30 feet on center with 5 shrubs per tree.

Plan review process, variance process, receive plan approval and permit, installation, inspection.

“5 years later” what does the site look like?
- Planted too deep
- Girdled trunks
- Outgrown tree grates

“5 years later” another project comes in, starts process all over again.
- Inventory, Salvage, Destroy, new Landscape
- Install, water, prune
- Cycle repeats
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City Ordinance

Designing for Failure
As a result, where is our:
- Urban forest?
- Shade?
- Pedestrian friendly streets?
- Pollution reduction?
- Heat reduction?
- Return on investment?

How do we solve these challenges?
- Start by focusing on pedestrian heavy areas for downtown and to create walkable, more sustainable developments.
Constructing the Urban Forest City Ordinance


- Green zones, street trees, pedestrian/bicycle focused, increased shade requirements.

- Step toward trees as infrastructure, design for landscape as opposed to left over areas.

- Great movement forward, but how to apply them to real world challenges?
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City Ordinance

Challenges

- Above or below ground utility conflicts with spaces most ideal for streetscape
- Past decisions, present problems
- Greater shade requirements
- Learning curve, new codes, how do designers show they are meeting the minimums and how are the plans reviewed
- Broad code to apply to various conditions versus individual projects challenges
- Opposing regulations (LID vs plants in drainage areas)
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City Ordinance

E. Van Buren Street

Typical Existing Condition - ST-80-64

Retrofit Pattern 1 - ST-80-64

Retrofit Pattern 2 - ST-80-64

A. Existing 2x2 with turn lane

A. Reduce travel lanes from 2x2 to 1x1 with bike lane
B. Fauxis pipes between existing curb and sidewalk
C. Relaxation motion
D. Screaming paning

A. Reduce travel lanes from 2x2 to 1x1 with bike lane
B. Fauxis pipes between existing curb and sidewalk
C. Add tree pockets
D. Screaming paning
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City Ordinance

➢ Solutions
  • Coordination between disciplines and departments.
  • Various codes, ordinances, departmental policies working in one direction.
    • P&D, Public Works, Parks, Streets, Water, MAG, Building Code, etc.
  • Example, planting next to water lines.
  • Cross training.
  • Working with designers and developers on solving case by case challenges.
  • Public input.
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City Ordinance

Planting a Liability or Growing an Asset

150 cubic feet of soil
Estimated lifespan: 7-10 yrs

- Installation Costs: $5,000 (replanted 5 times)
- Maintenance Costs: $1,211.99
- Total Benefits: $2,717.66
- Net Lifecycle Costs: $3,493.33

1,000 cubic feet of soil*
Estimated lifespan: 50+ yrs

*This design utilities Silva Cells

- Installation Costs: $14,000
- Maintenance Costs: $2,241.75
- Total Benefits: $41,769
- Net Lifecycle Costs: -$25,427.25
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Balancing Act

How do we accommodate a variety of needs and/or opposing needs

• Citizens
• Elected Officials
• City Management, City Departments
• Federal, State, Municipal

and grow healthy trees for an urban forest?
2030 VISION

Achieve an average 25% canopy coverage in Phoenix.
Even if everything on plan came out just right, it also depends on:
- Nursery industry practices
- Contractor installation practices
- Maintenance practices (watering and pruning)
- Owner

If we don’t have regulations, what will we get as a result?

Regulations only do so much and can’t solve all the issues.
- Up to industry professionals, designers, contractors, developers, citizens.
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Balancing Act

➢ What is the priority?

➢ What resources will it take?

➢ Change in the culture of what is being implemented.

➢ If we as a city of people want an urban forest and trees as green infrastructure, it will take both public and private efforts to reach that goal and maintain it.

➢ We are all in this vision together. How can we fix it together?
Benefits of Trees

- Environment
- Physical
- Emotional
- Economical
- Health, Safety, and Welfare