



2016

Constructing the Urban Forest

OVERVIEW

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



Today



Tomorrow

VISION

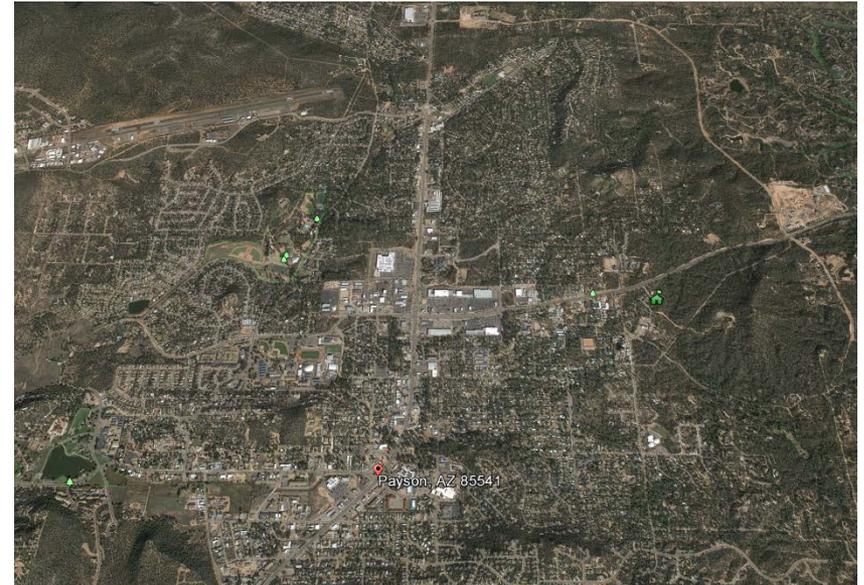


2010

Constructing the Urban Forest

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

2030 VISION

Achieve an average
25% canopy coverage
in Phoenix.

ACHIEVING THE VISION





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The FACTS

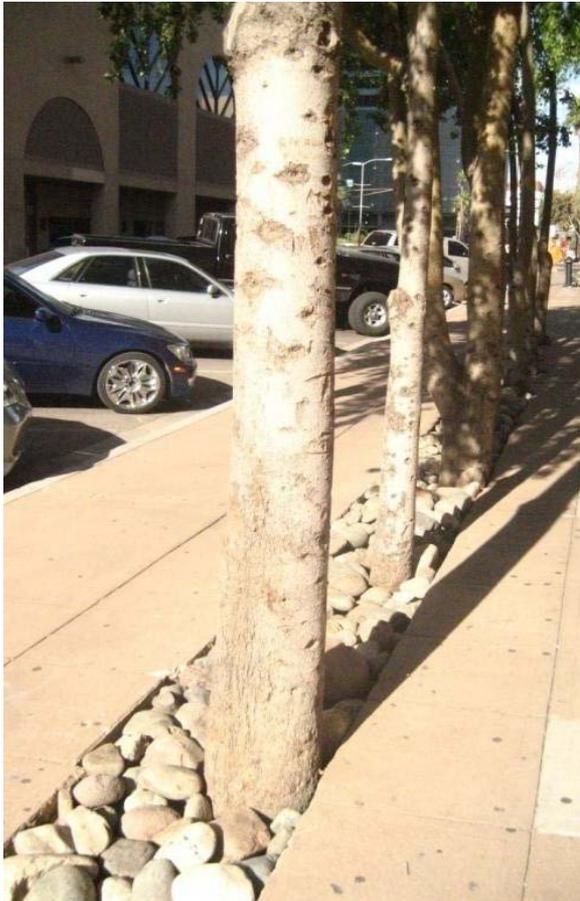
- Trees are not being planted or replanted at the same rate as they are being removed
 - 3900 Removed/3700 Planted = Net gain 95%
 - National Average for Tree Plantings - \$7.65/capita
 - Phoenix - \$3.48/capita
 - Return on investment (ROI) in Arizona of \$2.23 for every \$1 invested
 - Design, Planting, and Maintenance practices
 - Dead, Dying, or Safety Issues
- **Average Life Span of an Urban Tree – 7 Years**



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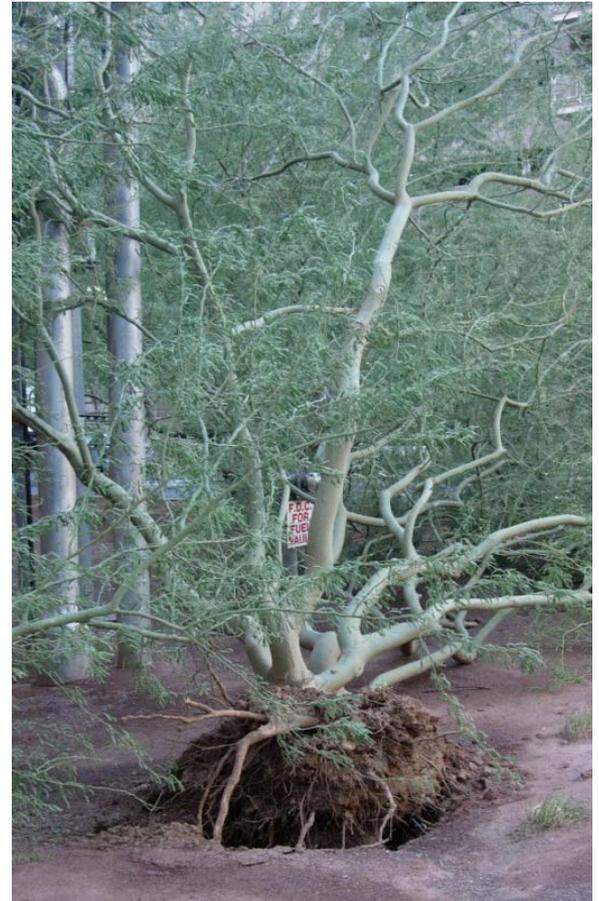
The FACTS



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

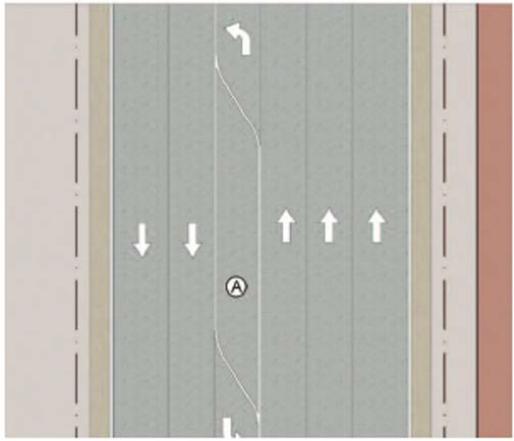
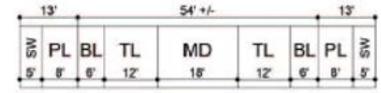
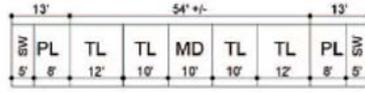
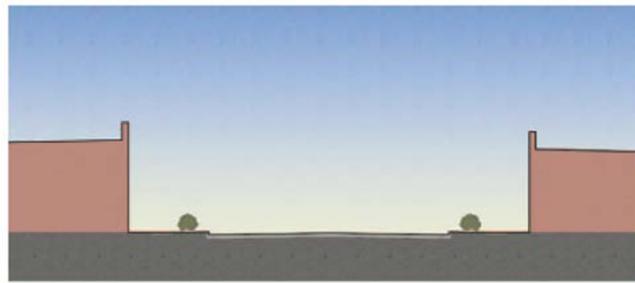
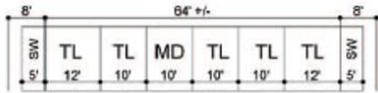
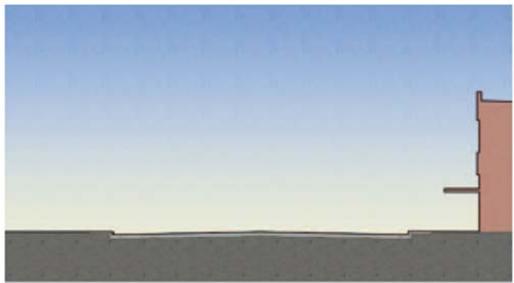
- **Human Needs and Desires**
 - Environment, Physical, Emotional, Economical
 - Health, Safety, Welfare



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The FACTS

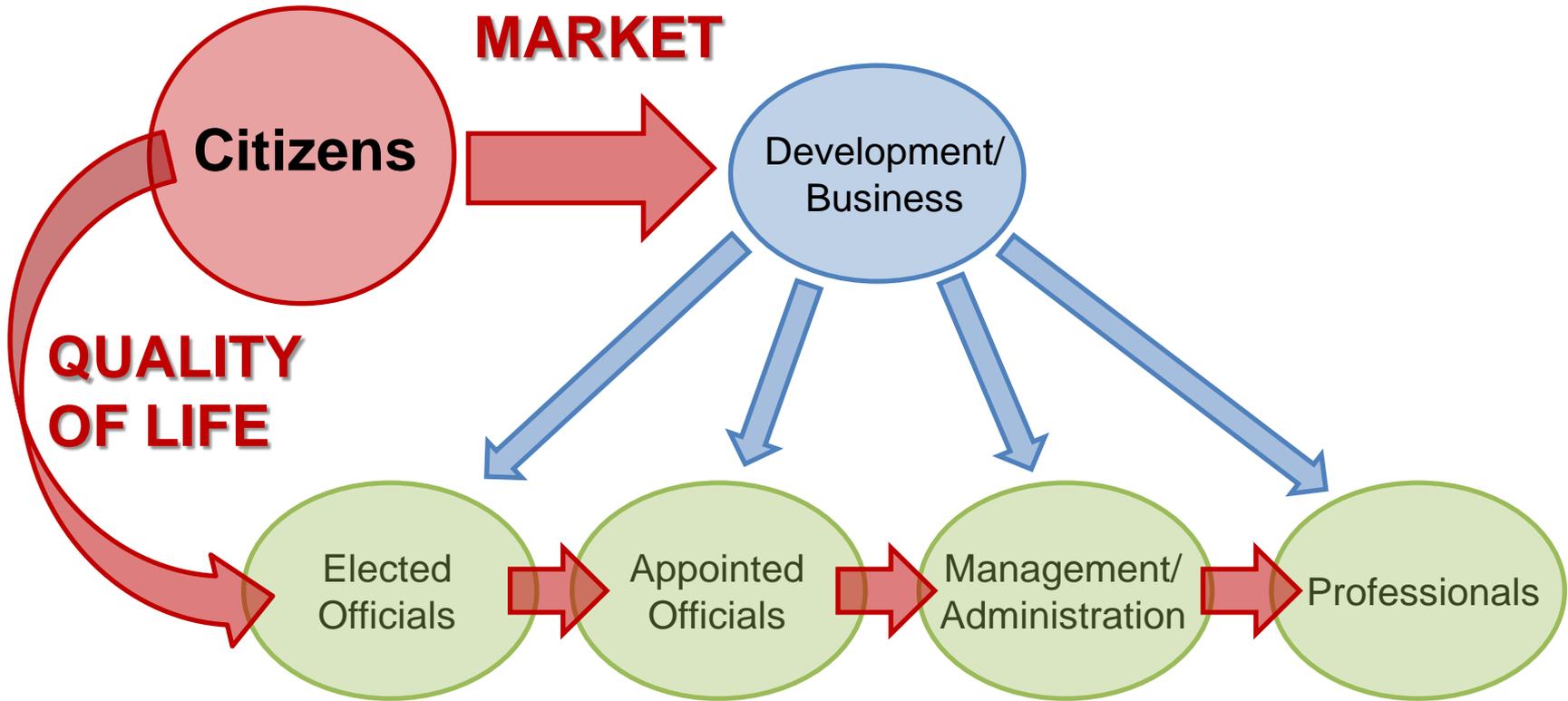




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The Decision Makers





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Constructing the Urban Forest Policy **vs** Regulatory

POLICY DEVELOPMENT & ENFORCEMENT

➤ **Statutes, Laws, Policies, and Ordinances**

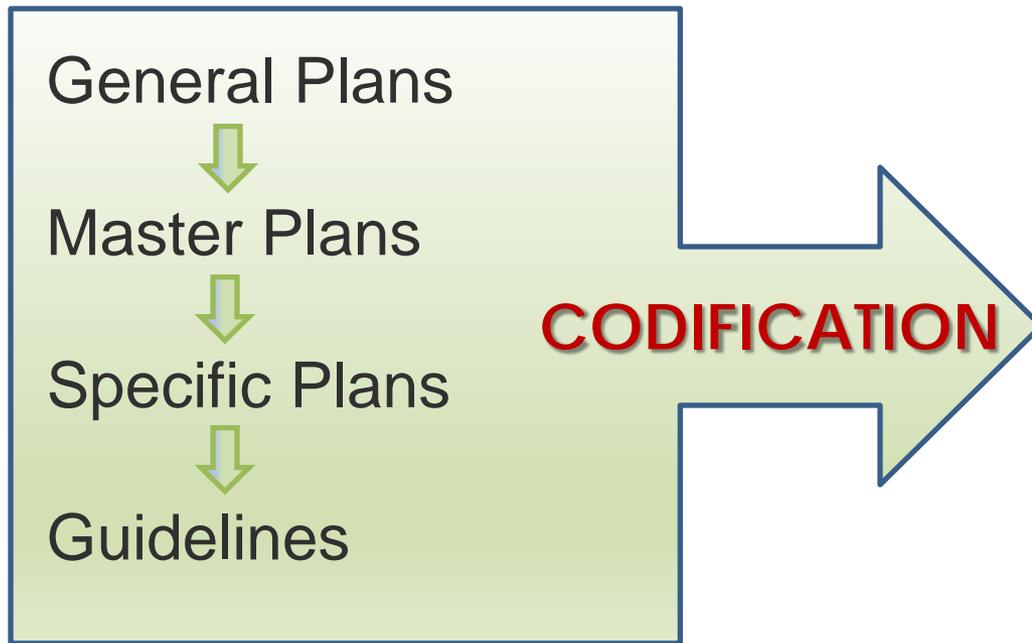
- Legislative Governments – Local, State, Federal
- Elected and Appointed Officials
- Planners, Attorneys
- Technical Professionals
- Developers, Homebuilders
- **CITIZENS = CITIZEN POWER**



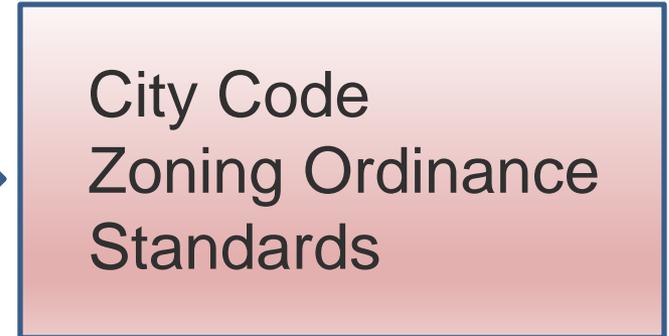
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Constructing the Urban Forest Policy **vs** Regulatory

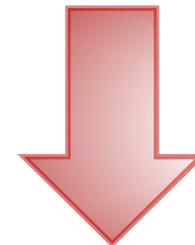
Vision



Implementation



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



Ordinance – Local Law that regulates 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,

Decision should be based on the intended duration and impact of the proposed action

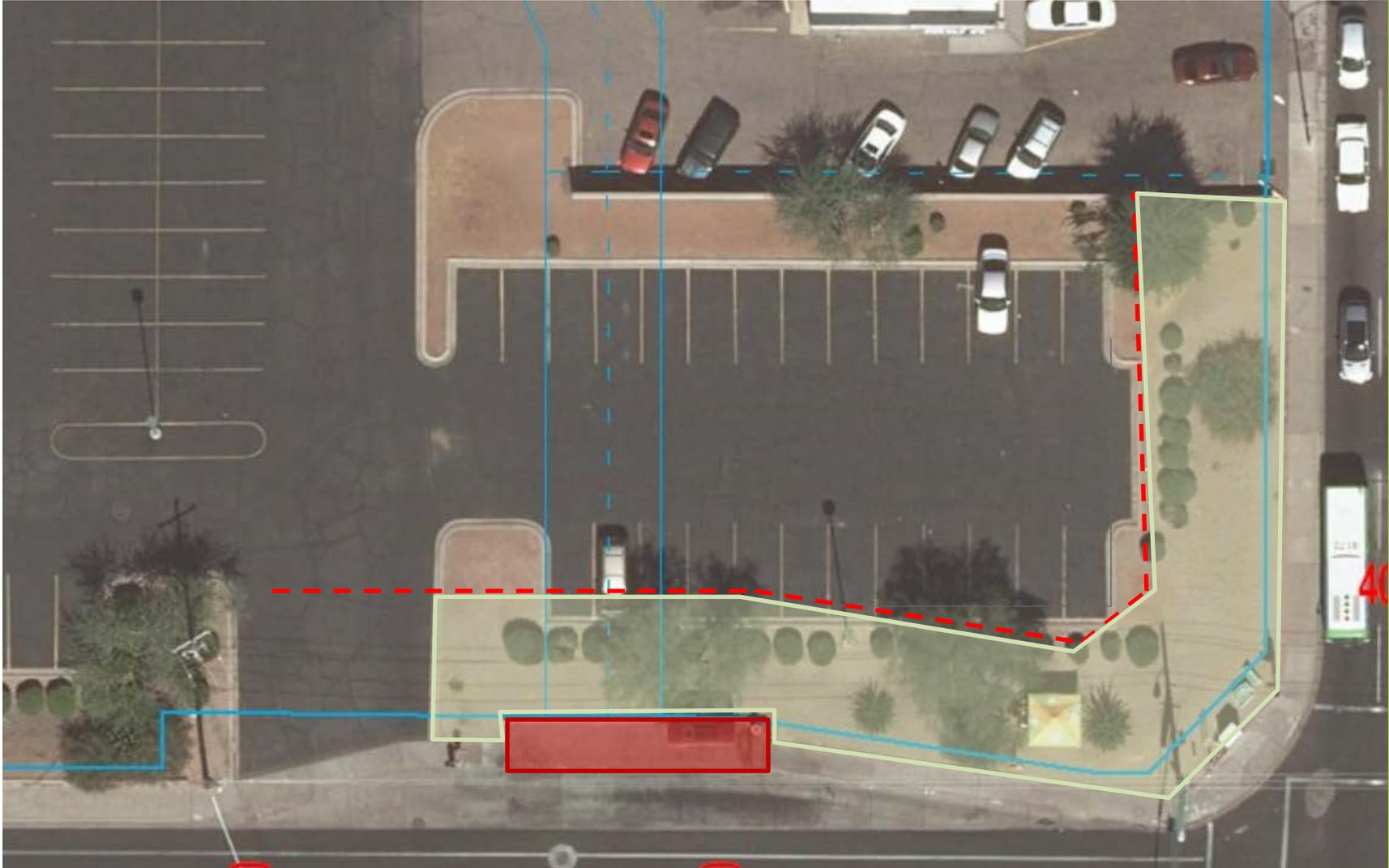
Ordinance

- 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*



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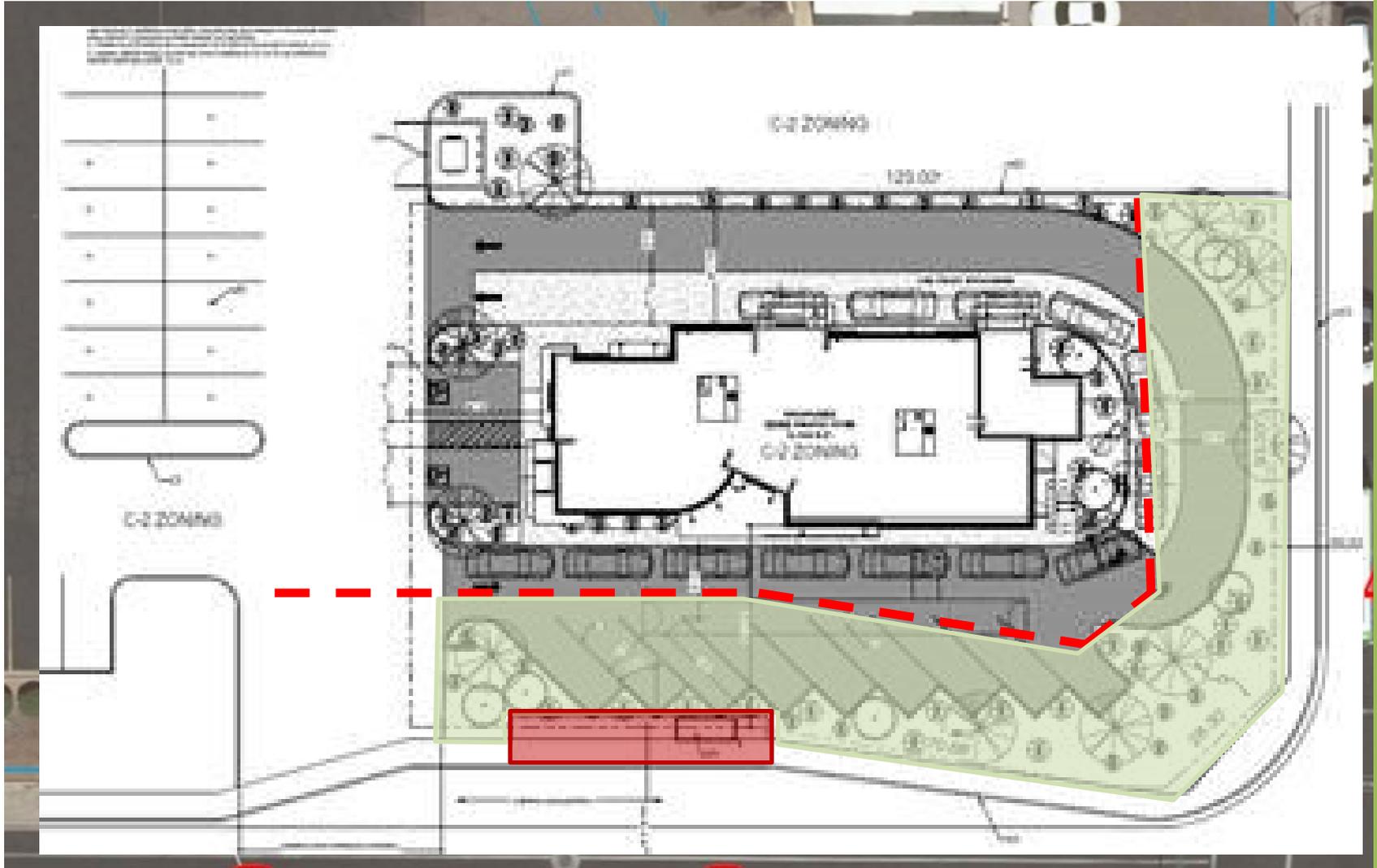
Constructing the Urban Forest The Ordinance





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Constructing the Urban Forest The Development Process

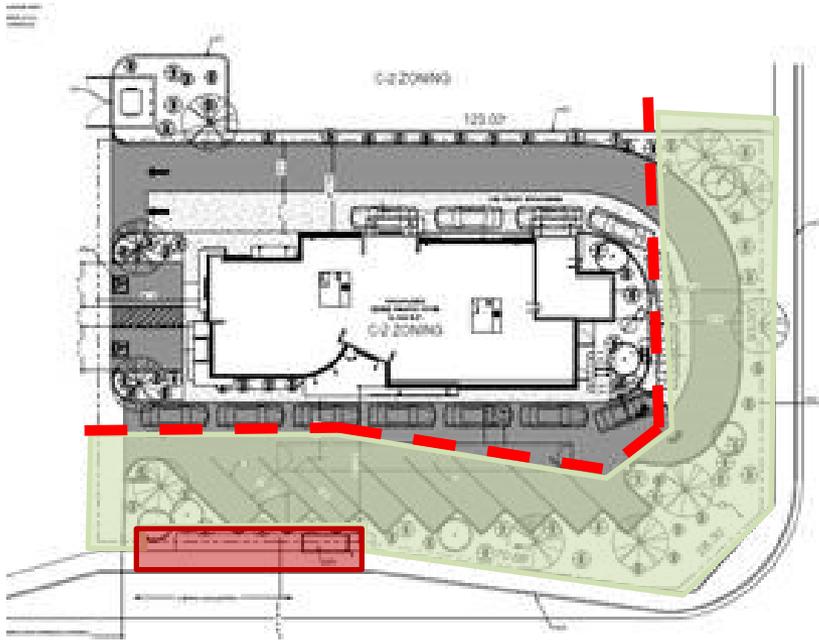




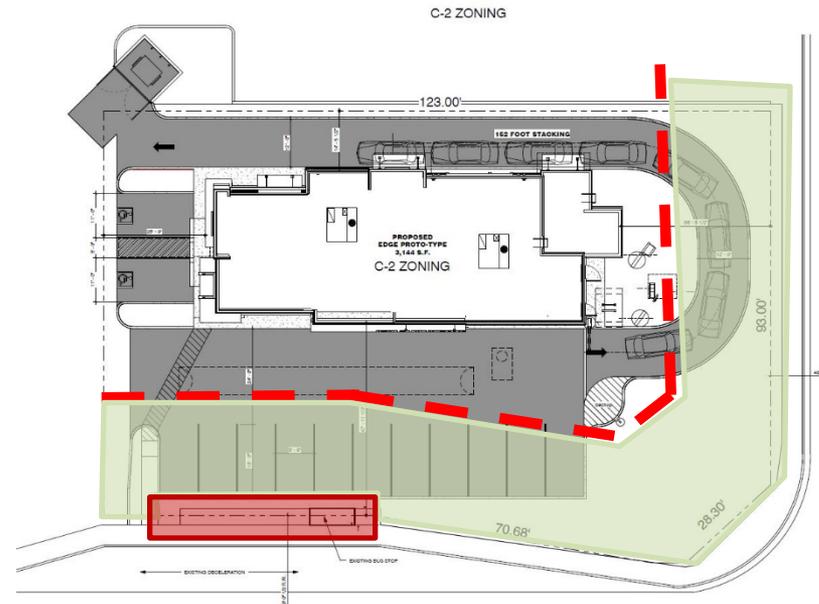
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The Development Process



Concept A

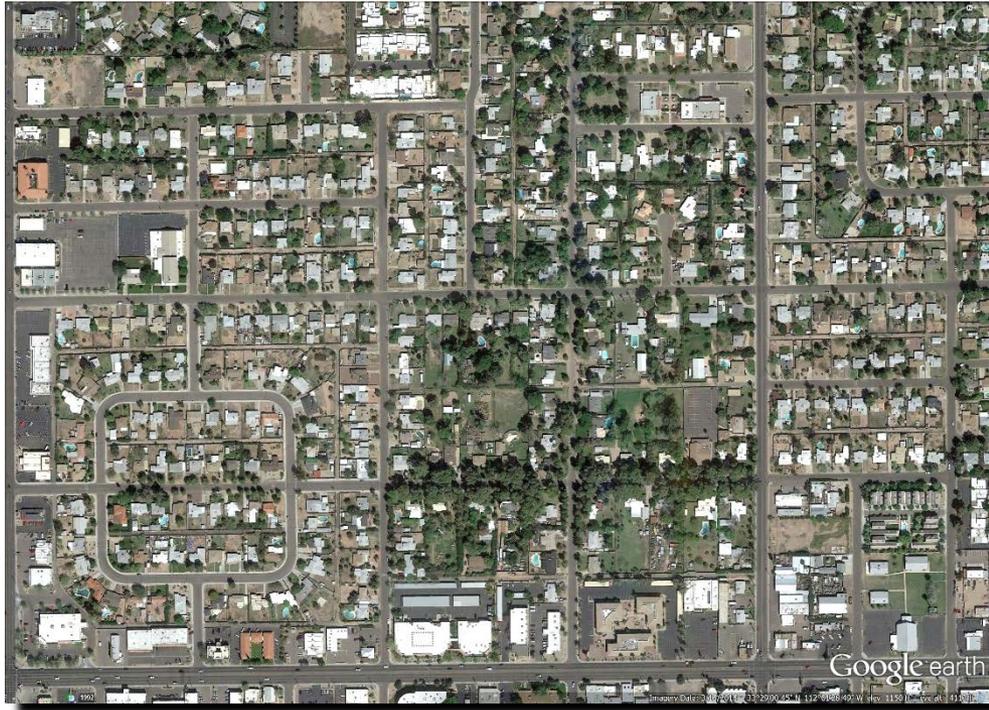


Concept B



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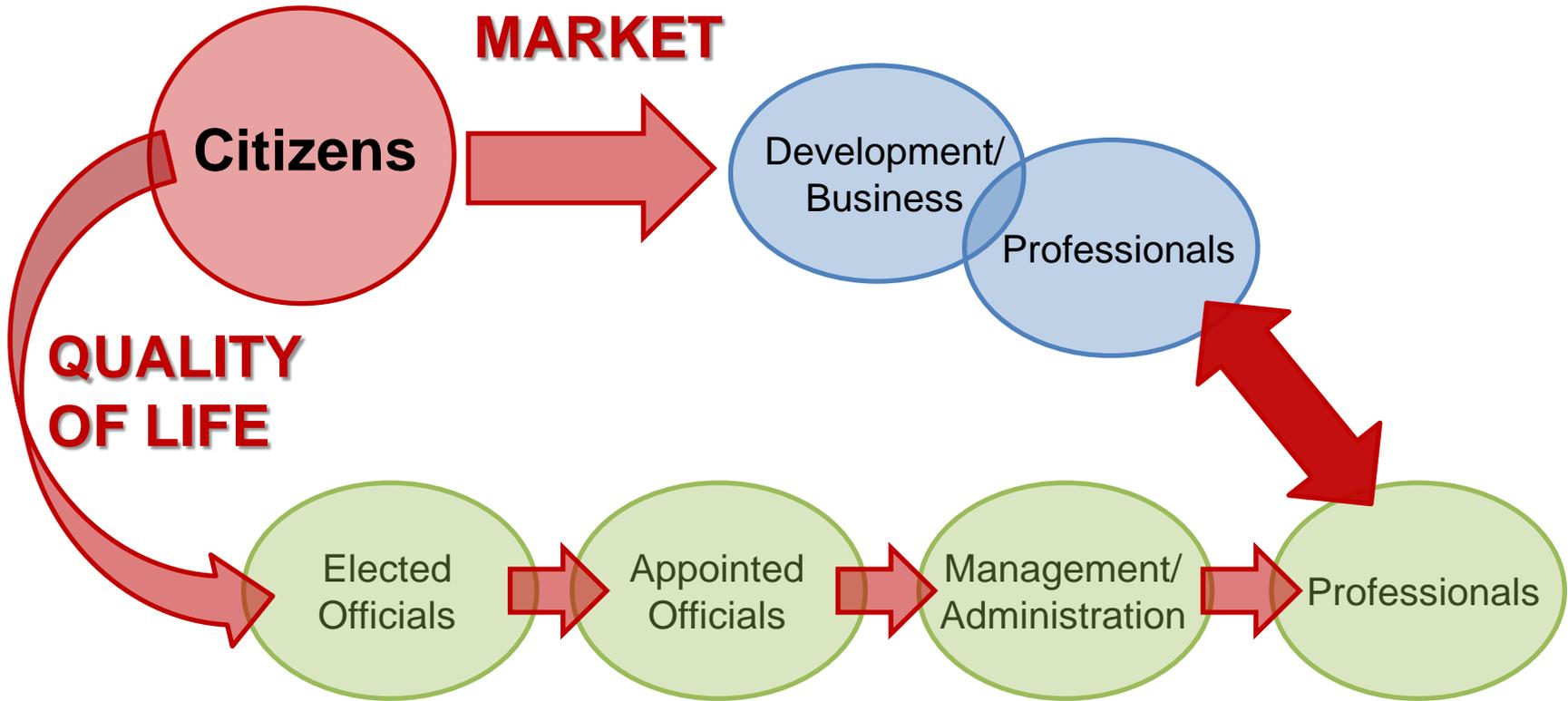
- **Enforcement**
- **Culture**



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The Decision Makers

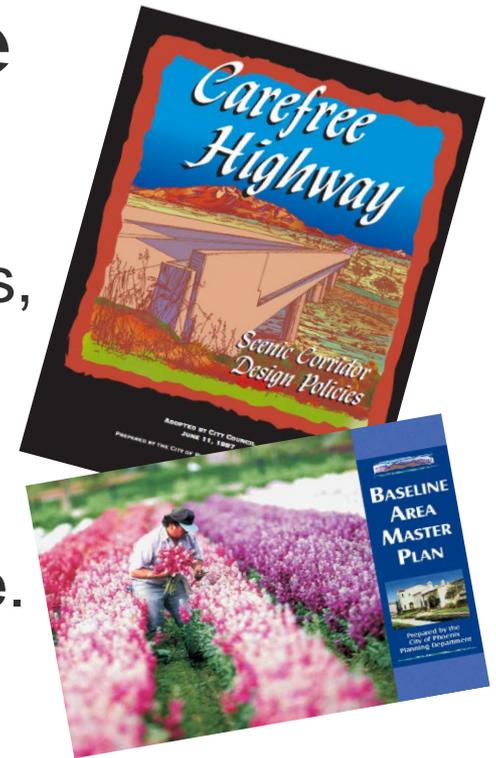




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- Overlay district, master plans, variances, stipulations, policy documents.
- Salvage or protect in place 4" caliper & cacti 3' and taller, native and non-native.
 - Common to make case to destroy.
- Minimum caliper sizes for new trees are 1", 2", 3", & 4" depending on the zoning district, 20-30 feet on center with 5 shrubs per tree.
- Minimum Landscape setbacks: 6', 8', 10', 15', 25', 30'.





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- 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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Constructing the Urban Forest City Ordinance



Designing for Failure





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Constructing the Urban Forest

City Ordinance

- 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.



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Constructing the Urban Forest City Ordinance

- Development of the Downtown Code and the Walkable Urban Code.
- 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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Constructing the Urban Forest 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)

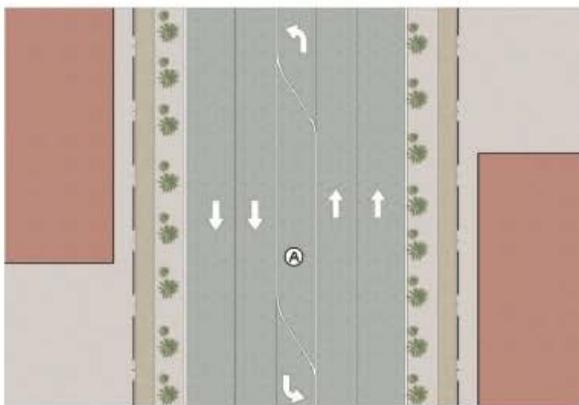
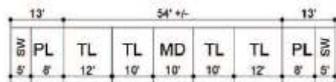
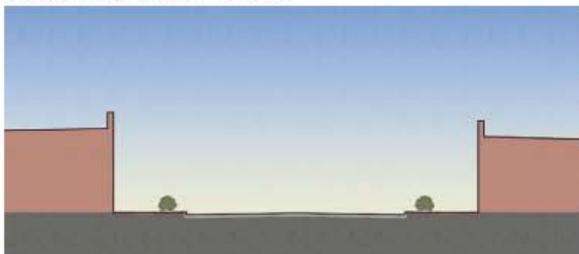


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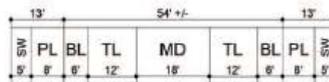
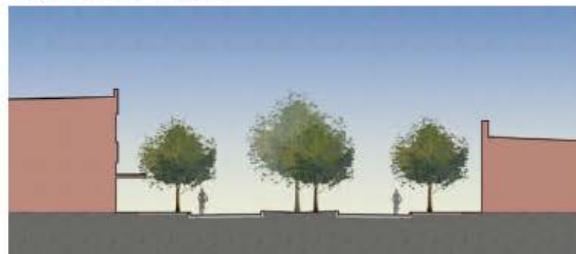
E. Van Buren Street

Typical Existing Condition - ST-80-54



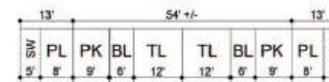
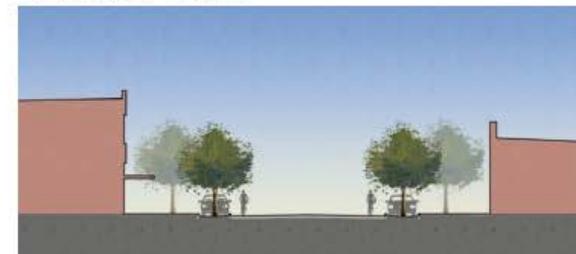
A. Existing 2x2 with turn lane

Retrofit Pattern 1 - ST-80-54



- A. Reduce travel lanes from 2x2 to 1x1 with bike lanes
- B. PerVIOUS pavers between existing curb and sidewalk
- C. Raised median
- D. Screened parking

Retrofit Pattern 2 - ST-80-54



- A. Reduce travel lanes from 2x2 to 1x1 with bike lanes
- B. PerVIOUS pavers between existing curb and sidewalk
- C. Add tree pockets
- D. Screened parking



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➤ 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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Planting a **Liability** or Growing an **Asset**



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



1,000 cubic feet of soil*
Estimated lifespan: 50+ yrs
*This design utilizes Silva Cells

Installation Costs \$5,000 (replanted 5 times)

Maintenance Costs \$1,211.99

Total Benefits \$2,717.66

Net Lifecycle Costs \$3,493.33

Installation Costs \$14,000

Maintenance Costs \$2,241.75

Total Benefits \$41,769

Net Lifecycle Costs -\$25,427.25



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Constructing the Urban Forest 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.



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Constructing the Urban Forest Balancing Act

- 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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Constructing the Urban Forest Balancing Act

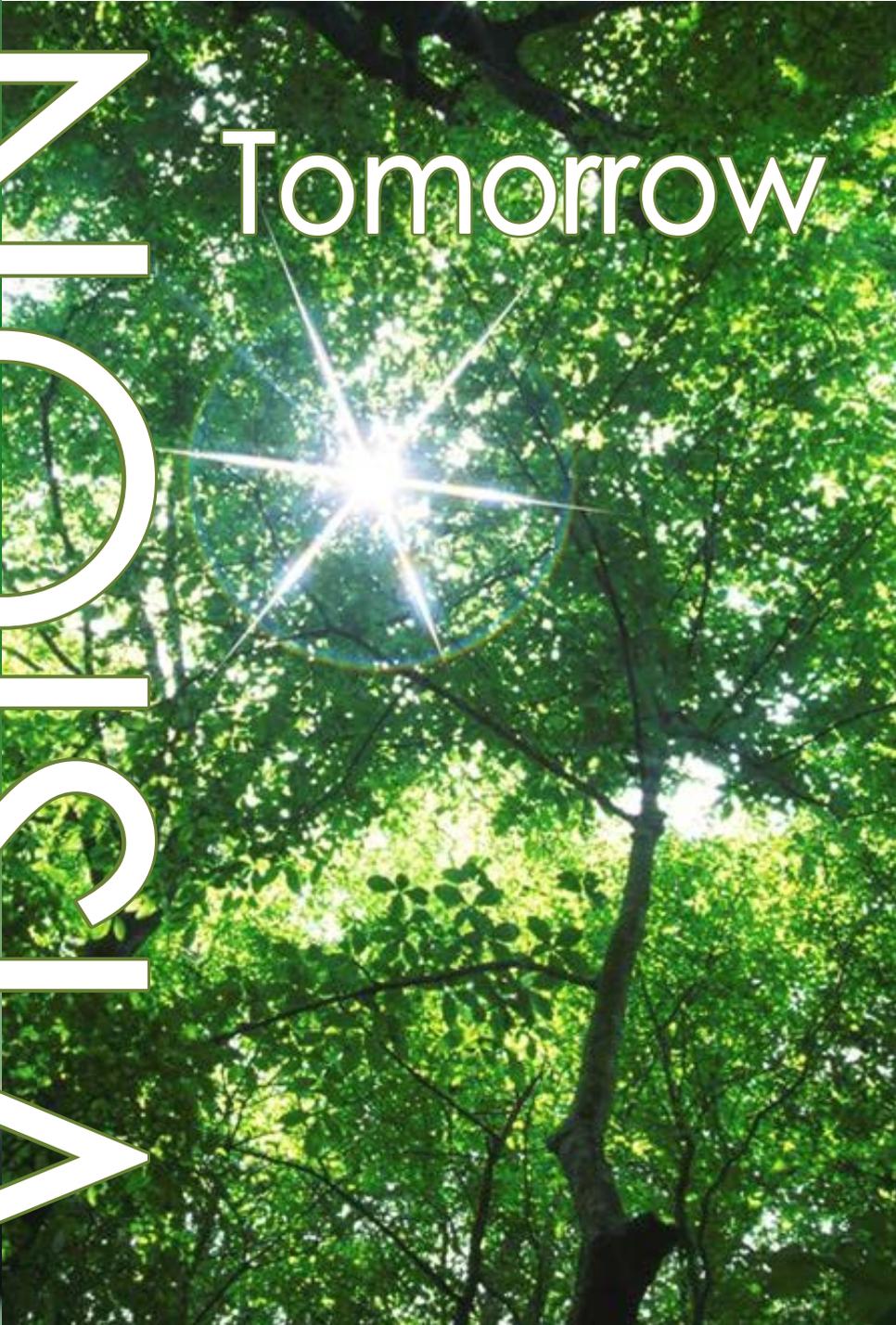
- What is the priority?
- What resources will it take?
- Change in the culture of what is being implemented.
- If we as a city of people want an urban forest and trees as green infrastructure, it will take both public and private efforts to reach that goal and maintain it.
- We are all in this vision together. How can we fix it together?

Today



VISION

Tomorrow





2016



- **Environment**
- **Physical**
- **Emotional**
- **Economical**

- **Health, Safety, and Welfare**

Benefits of Trees

