

Design Solutions for Sustainable Streets & Roadsides



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Topics for today's presentation

- Tree values
- Design as a process
- Trees as design and landscape elements
- Constraints in urbanized landscapes
- Streetscape scenarios
- A few solutions



Urban design to encourage tree canopy



- Trees often grow poorly in urban areas for a variety of reasons.
- Poor design is often one of those reasons.

Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees



Few people want cities without trees

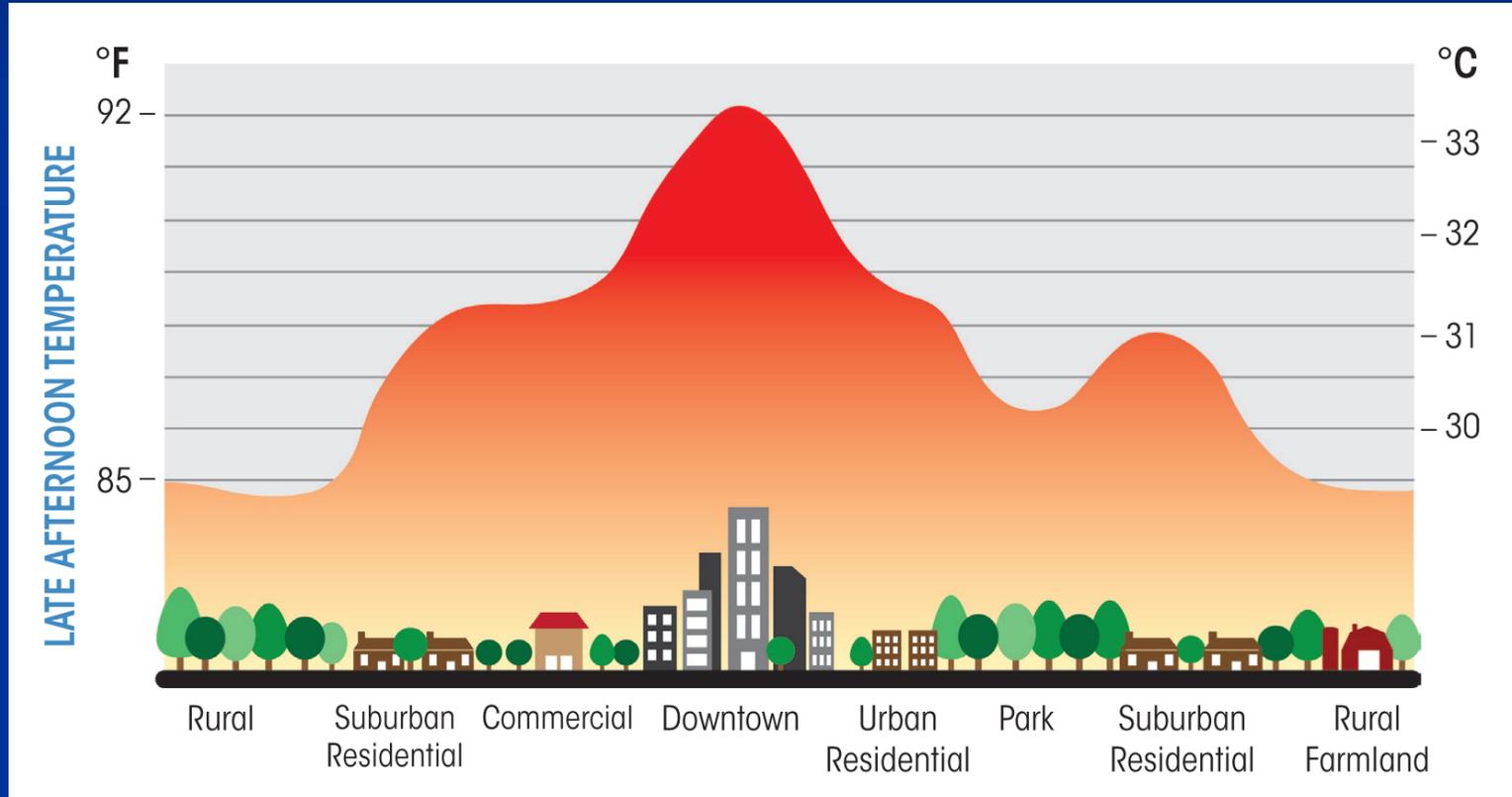


Few people want cities without trees

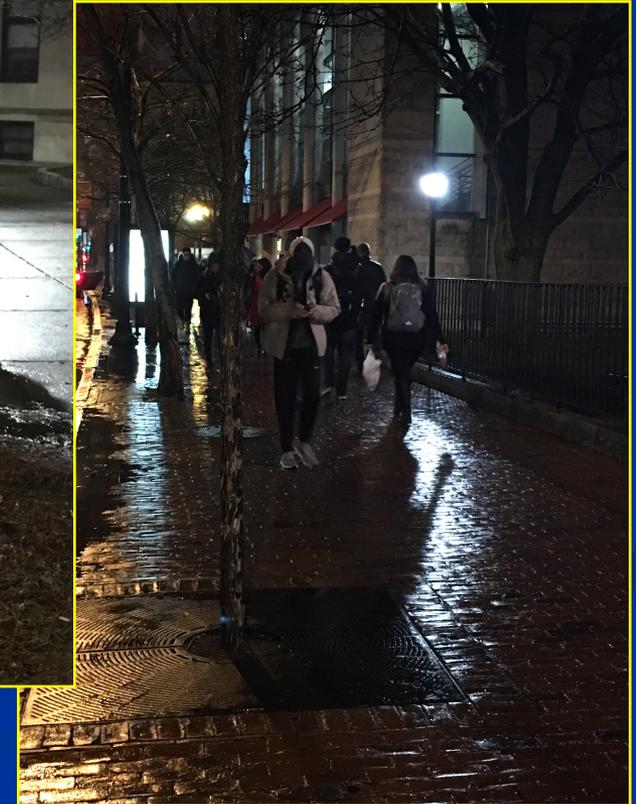
- A city without trees is hotter in summer, receives less rainfall, has greater runoff following storms, has fewer shoppers, and is not inviting



Urban Heat Island



Impact of Stormwater & Impervious Area

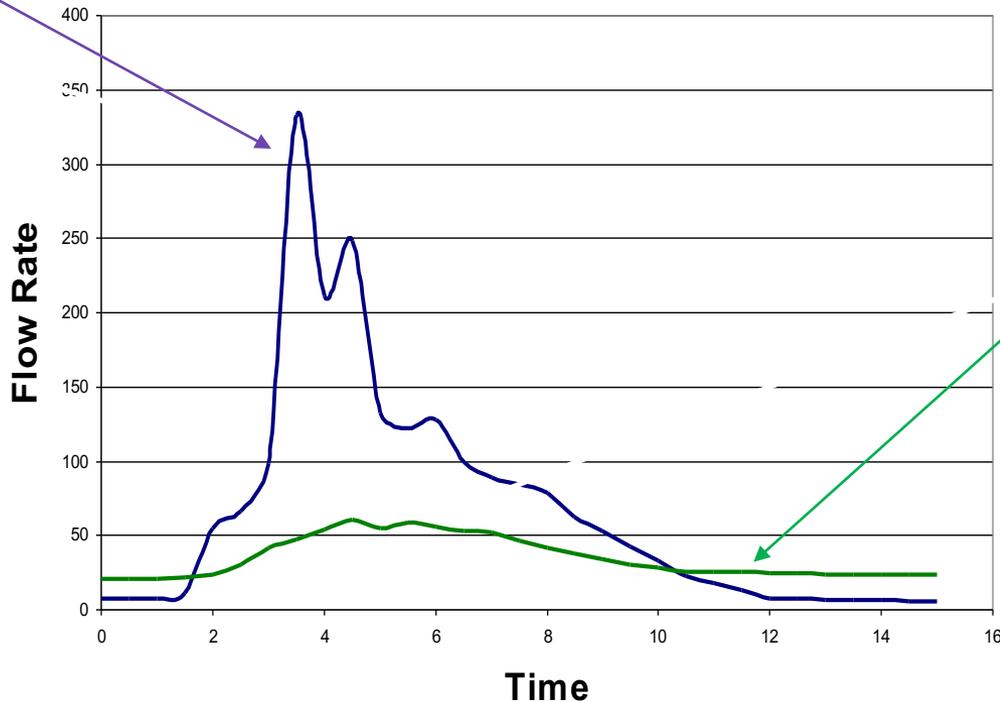


The Urban Storm Hydrograph

Greater Peaks & Volume

Urban

Urban vs Forested
Storm Hydrographs



Forested

Poor design leads to failure



- Trees struggle unless spaces are designed appropriately
- When lots of money is thrown at tree projects without guidance from knowledgeable professionals, waste occurs and no one wins

Poor design leads to failure



Poor design leads to failure



Poor design leads to failure

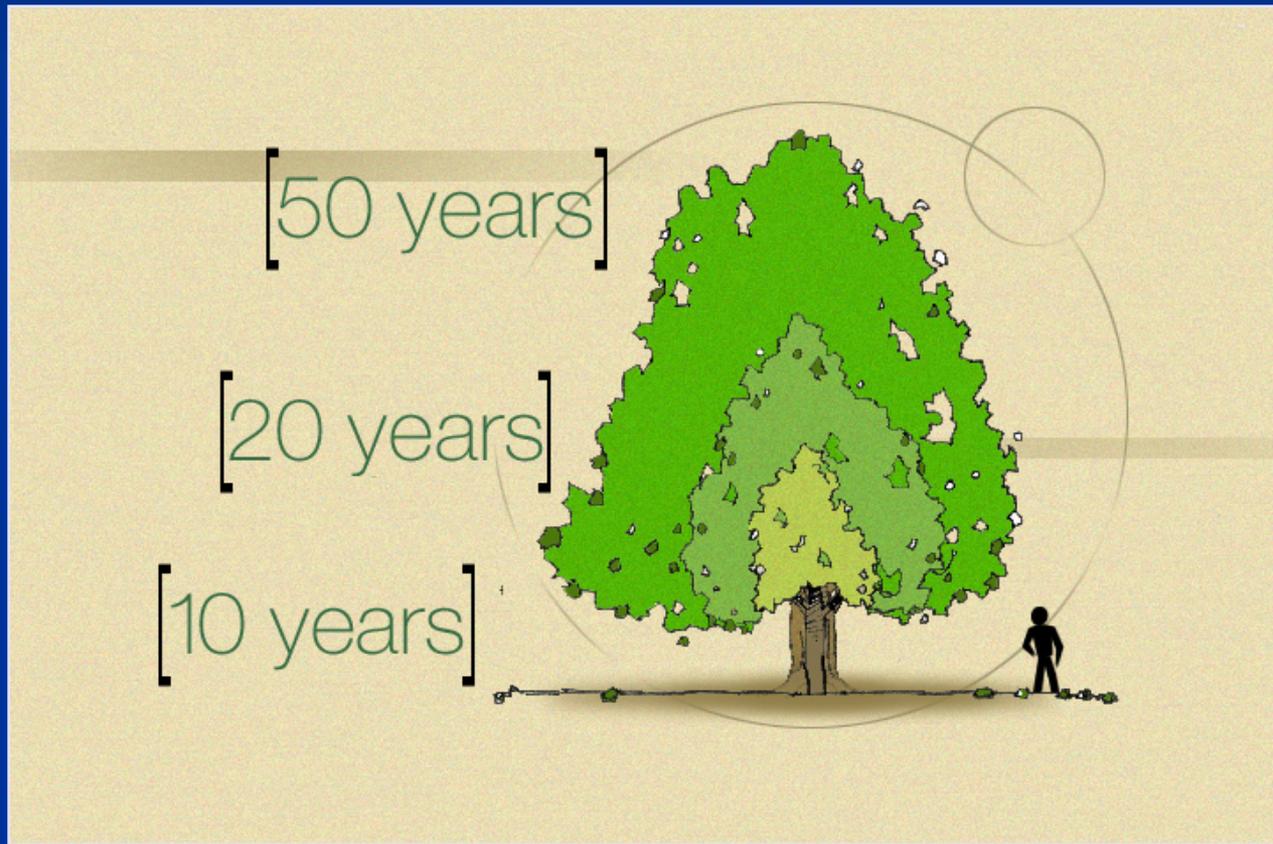


Good design leads to success



- Trees thrive when good designs are executed properly
- Healthy trees increase property value, intercept air pollutants, buffer temperatures, reduce wind speed, cool the city, reduce runoff from storms, encourage people to visit and spend money at shops, and create a more inviting community

Good design leads to success



Good design leads to success



Good design leads to success



Good design leads to success

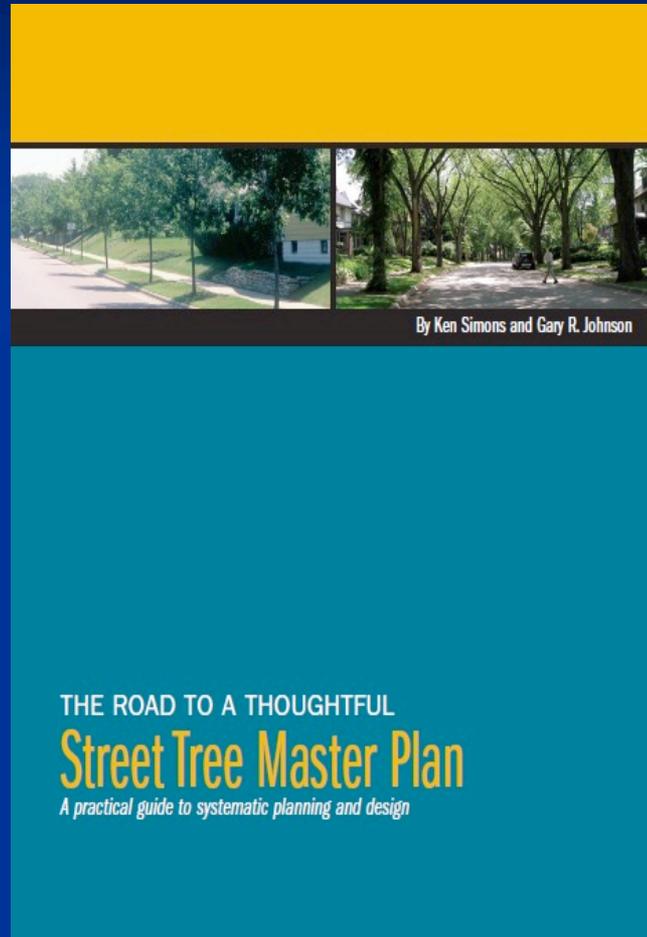


Good design leads to success



Good design leads to success





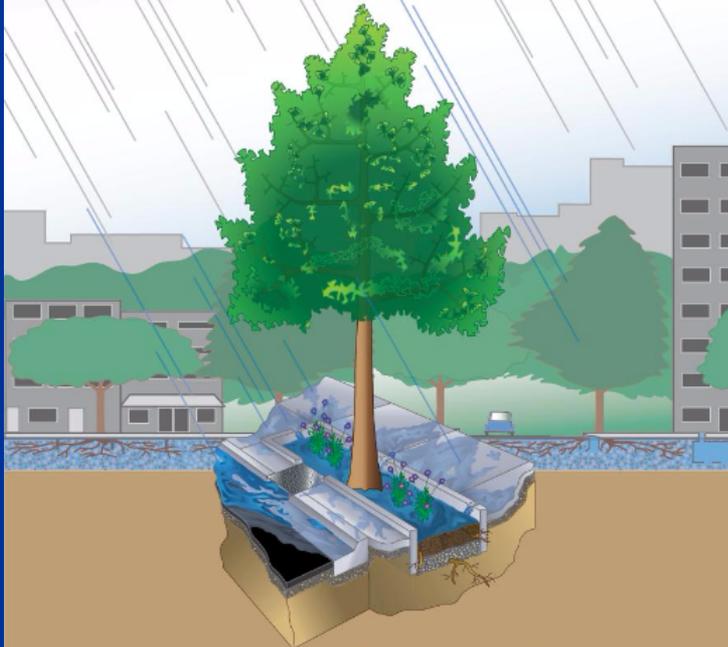
THE ROAD TO A THOUGHTFUL
Street Tree Master Plan
A practical guide to systematic planning and design

Ken Simons¹
and
Gary R. Johnson²



United States
Environmental Protection
Agency

STORMWATER to STREET TREES



Engineering Urban Forests for
Stormwater Management

Stormwater to

Street Trees:

Engineering Urban Forests for Stormwater Management

U.S. Environmental Protection Agency
Office of Wetlands, Oceans and Watersheds

Nonpoint Source Control Branch (4503T)

1200 Pennsylvania Ave., NW
Washington, DC 20460

September 2013

EPA 841-B-13-001

Urban



Street



Design



Guide



National Association of City Transportation Officials

Urban Street Design Guide



National Association of
City Transportation Officials



Good design must be realistic



Good design must be realistic



Good design must be realistic



Good design must be realistic



Good design is contextual



Good design shapes the community



Good design should be comprehensive

Streetscape Detail Perspective



Key Design Elements

Below is a list of key design features influencing the overall streetscape concepts.

- Create ADA compliant curb ramps by limiting slope to 8% max, 5' wide min., and include a strip of truncated dome detectable warning pavers at the base of the ramps.
- The pedestrian crosswalks will be delineated by brick stamped concrete paving. The color of the concrete should be brick red to resemble natural clay brick color.
- Redefined parking lots, business entries, and circulation will provide for a more fluid and safe travel of vehicular and pedestrian traffic.
- Planting strips along sidewalks will provide aesthetic appeal and soften to overall look of the streetscape.
- The proposed street lights are placed to provide sufficient lighting to key areas throughout the corridor, without overpowering the calm suburban feel that exists. The light standards will also help to create a visual and physical barrier between the roadway and pedestrian zone.
- Landscaped medians will be used at major pedestrian crosswalks to help designate the pedestrian crossings. Through the rest of the corridor a continuous turn lane will be used to allow for maximum vehicular access.

Good design can provide vision



Principles of Design

Unity

Balance

Transition

Proportion

Rhythm

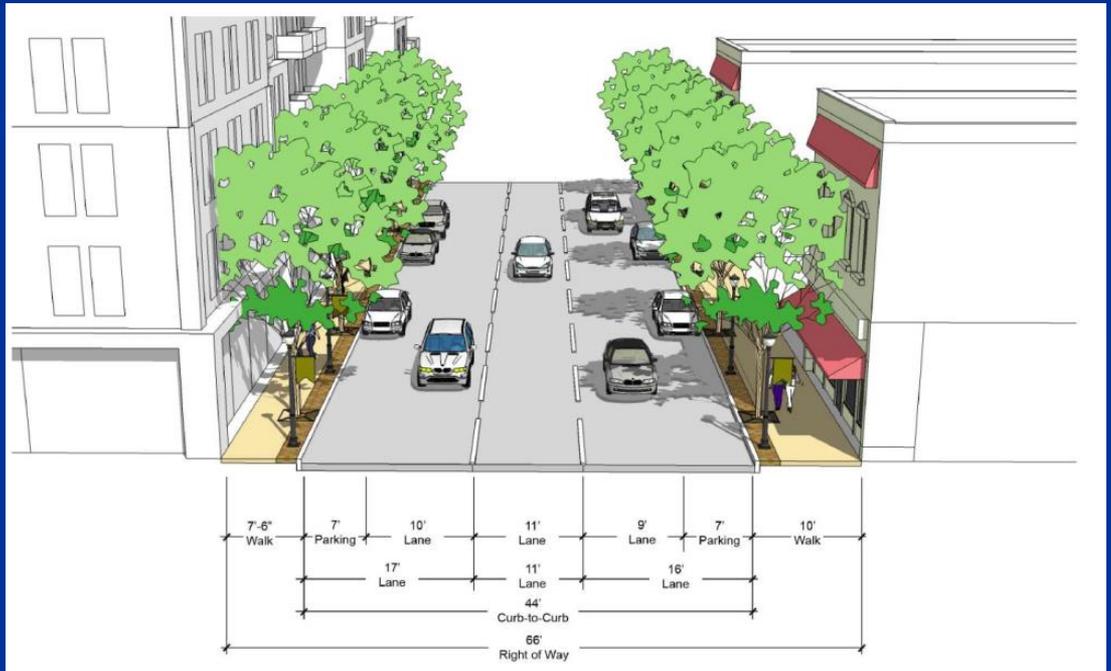
Repetition

Simplicity



Principles of Design

Unity
Balance
Transition
Proportion
Rhythm
Repetition
Simplicity



Elements of Art

Color

Line

Form

Texture

Scale



Elements of Art

Color

Line

Form

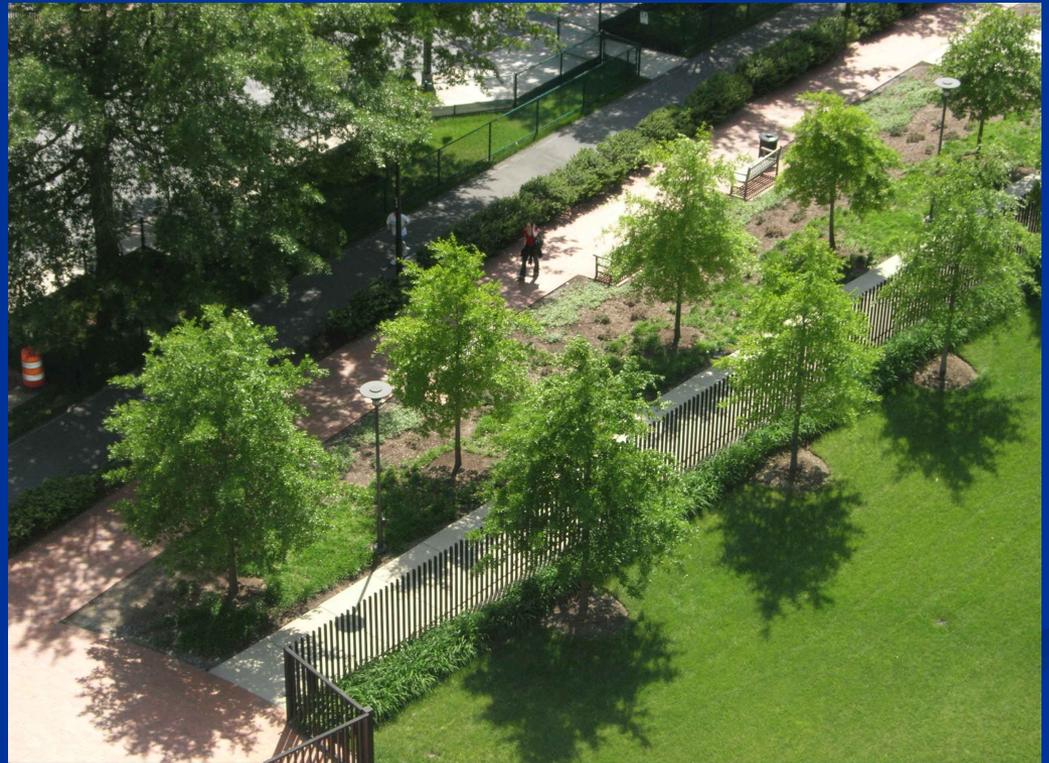
Texture

Scale



Principles of Science

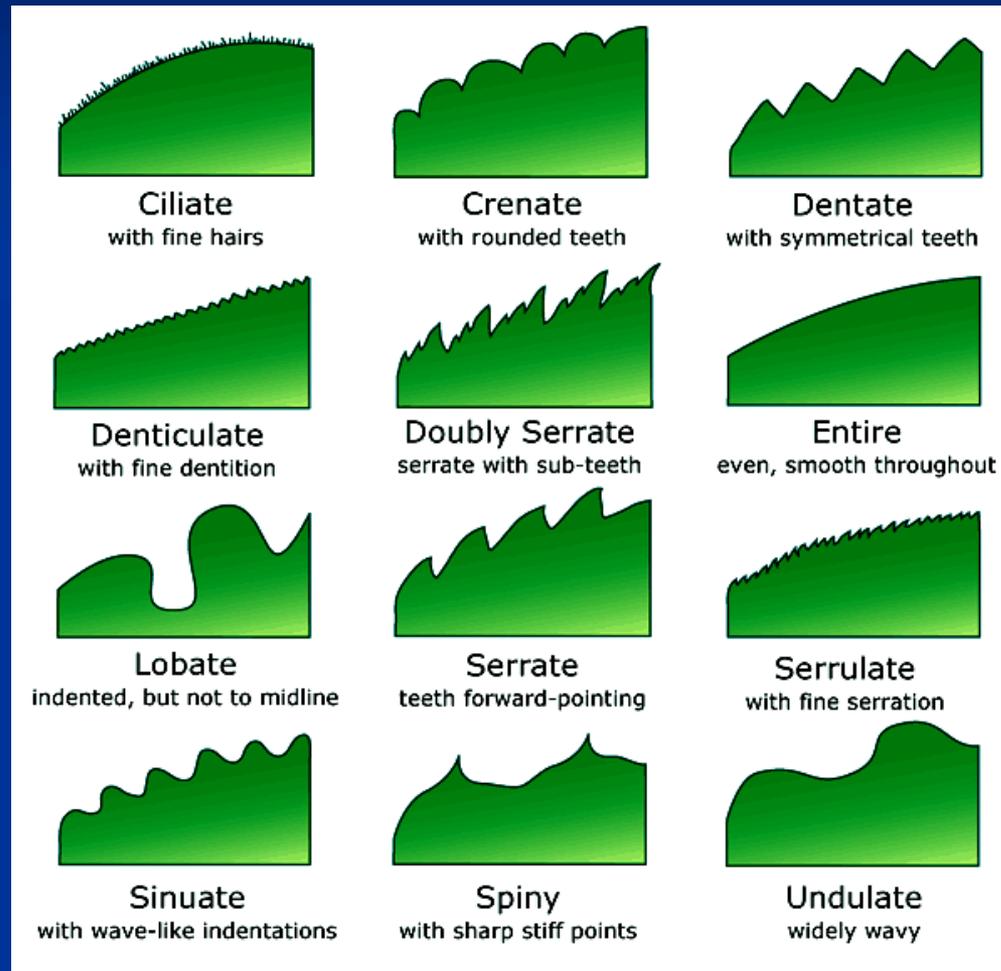
- Horticulture
 - Plant needs
 - Insect and diseases
 - Hardiness zones
 - Physiological Constraints
- Engineering
 - Materials
 - Methods
 - Soils and drainage
 - Irrigation systems



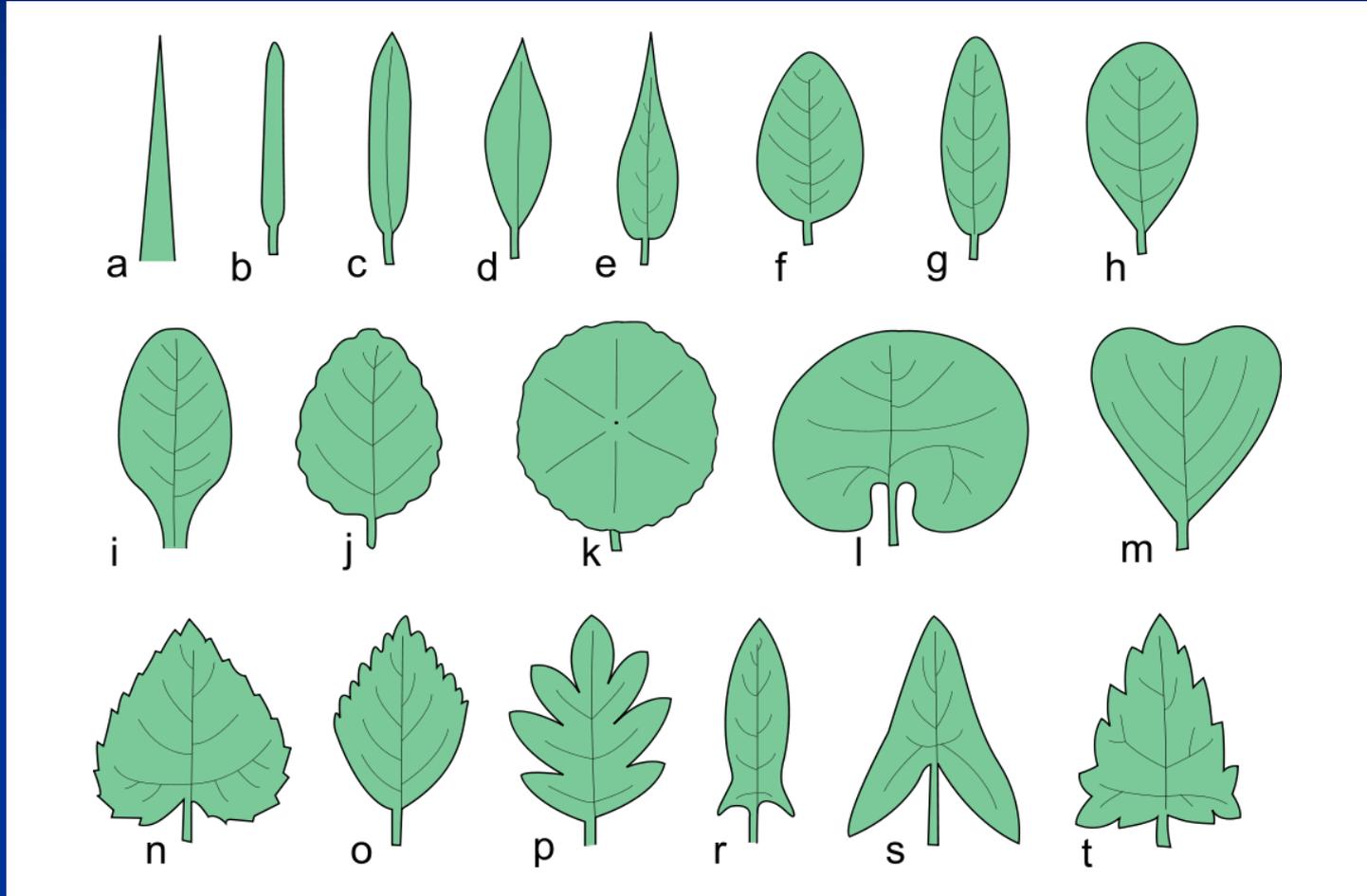
Trees as Landscape Elements



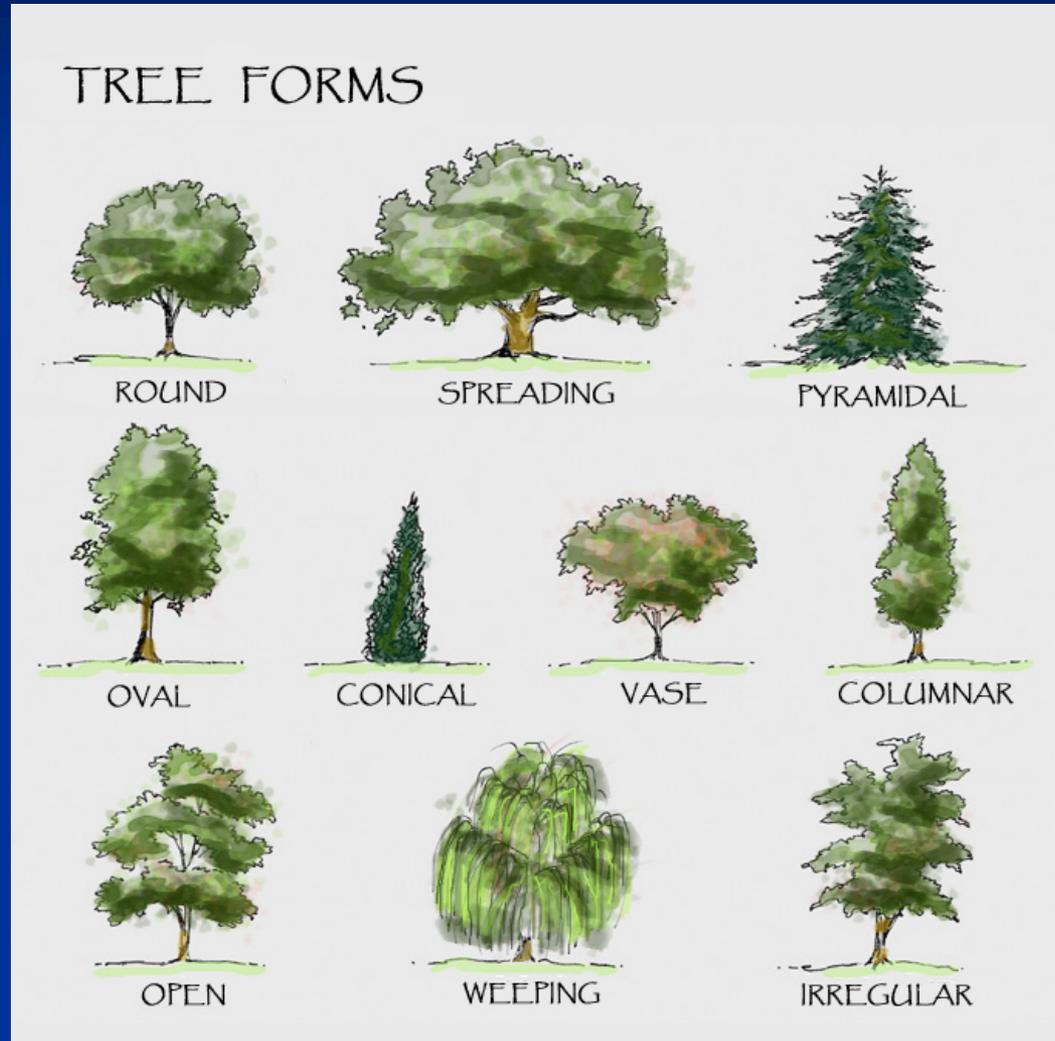
Trees as Landscape Elements



Trees as Landscape Elements



Trees as Landscape Elements







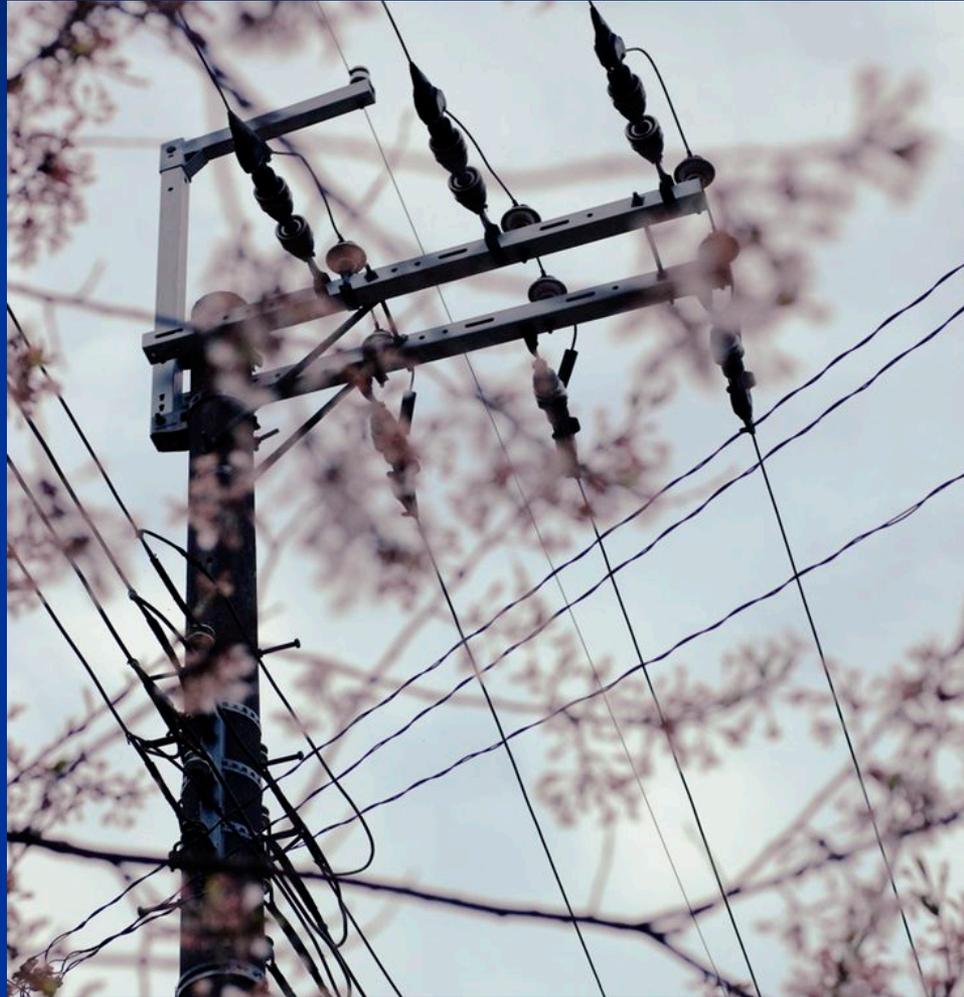


Military Dr 1730

1730 Military Dr



Trees as Landscape Elements



Constraints

Trees as Landscape Elements



Constraints

Trees as Landscape Elements



Constraints

Trees as Landscape Elements



Constraints

Trees as Landscape Elements



Constraints

Trees as Landscape Elements



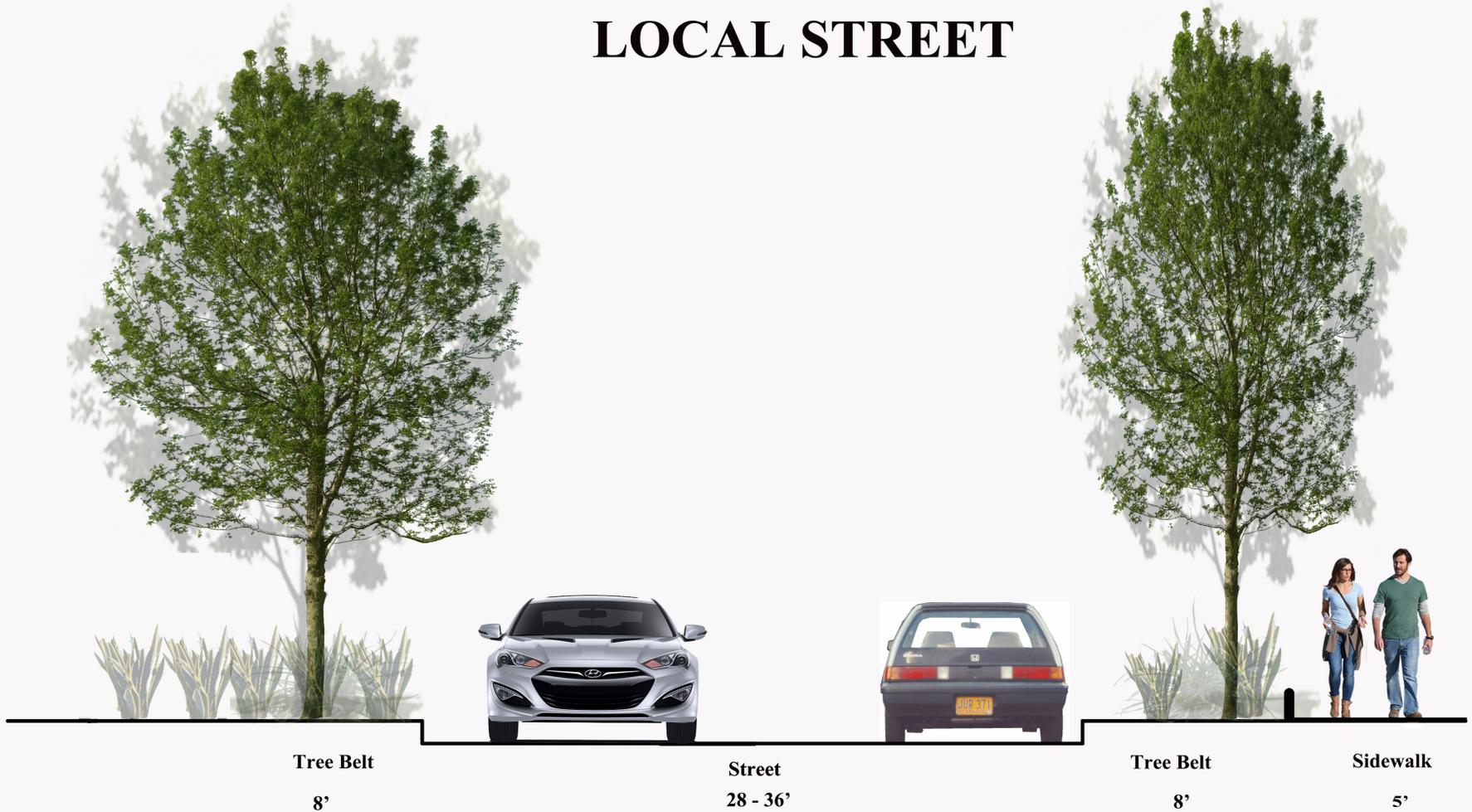
Trees as Landscape Elements



Constraints

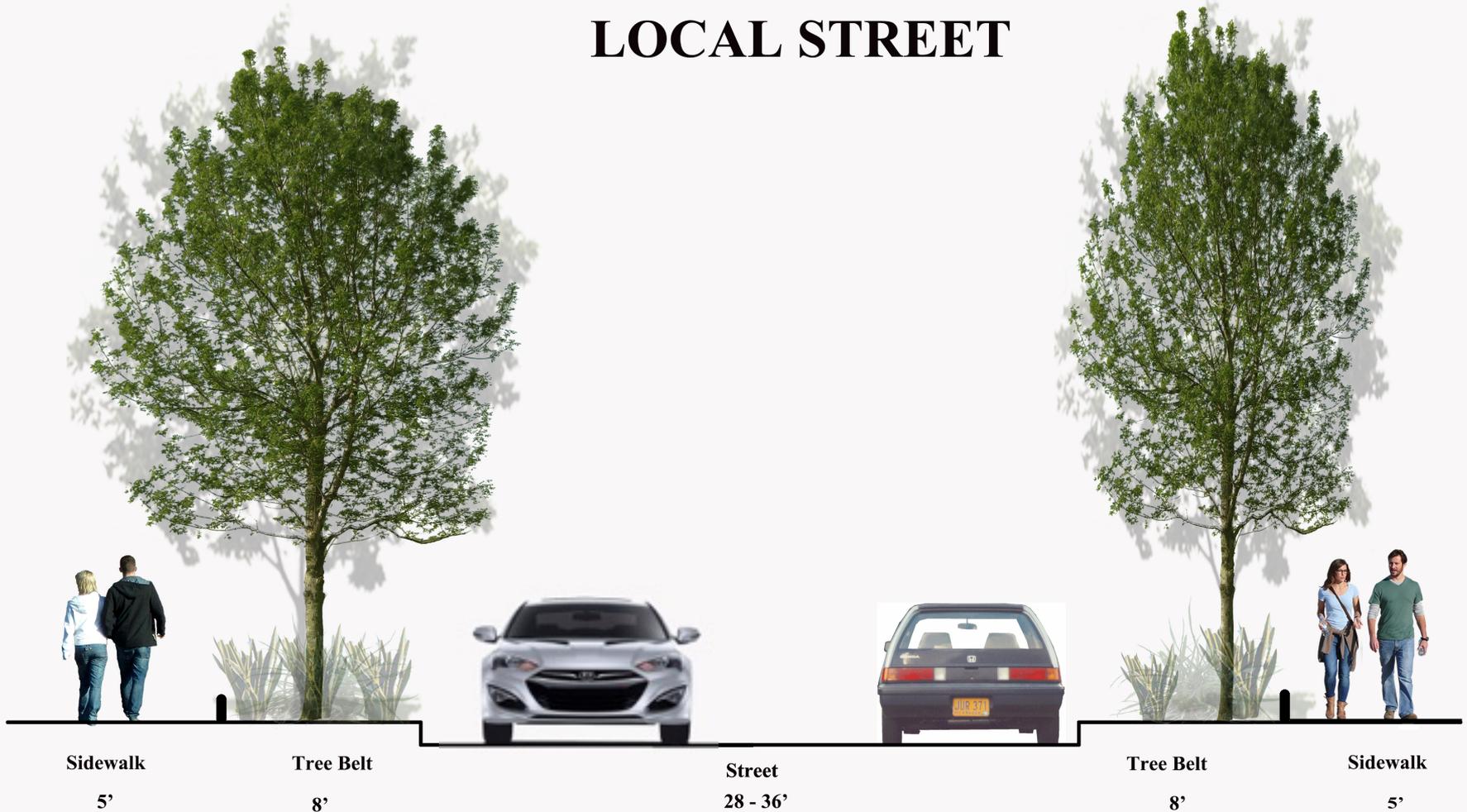
Streetscape design scenarios

LOCAL STREET



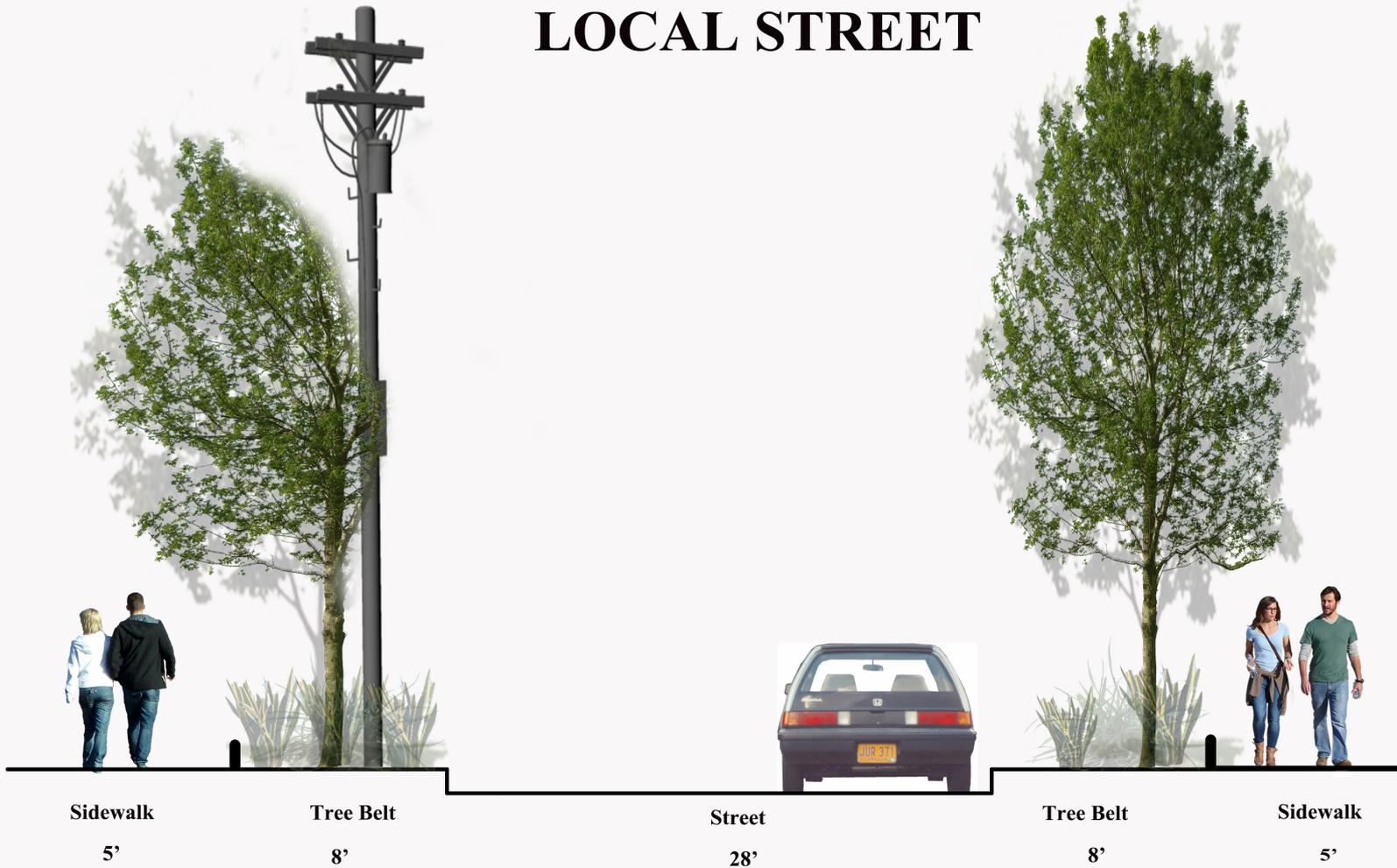
Streetscape design scenarios

LOCAL STREET



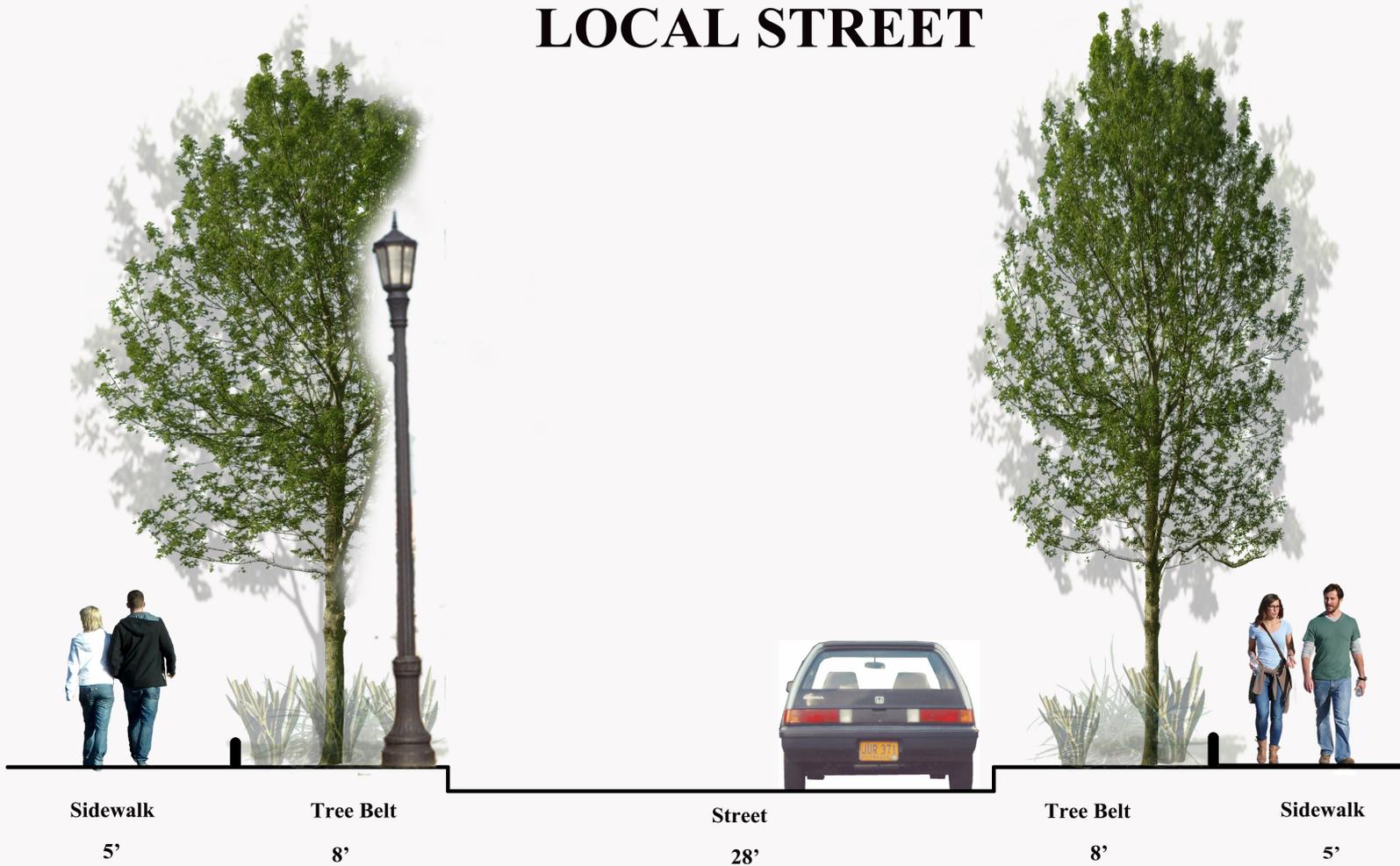
Streetscape design scenarios

LOCAL STREET

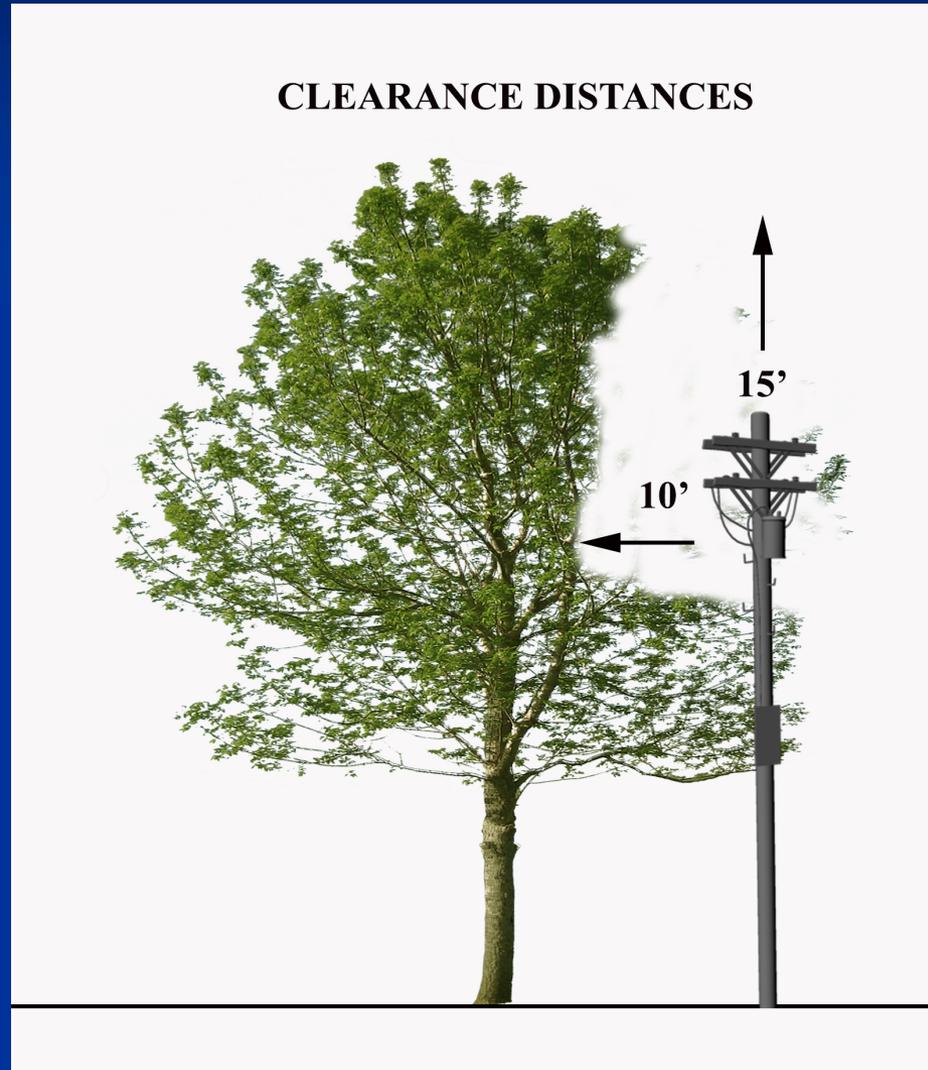


Streetscape design scenarios

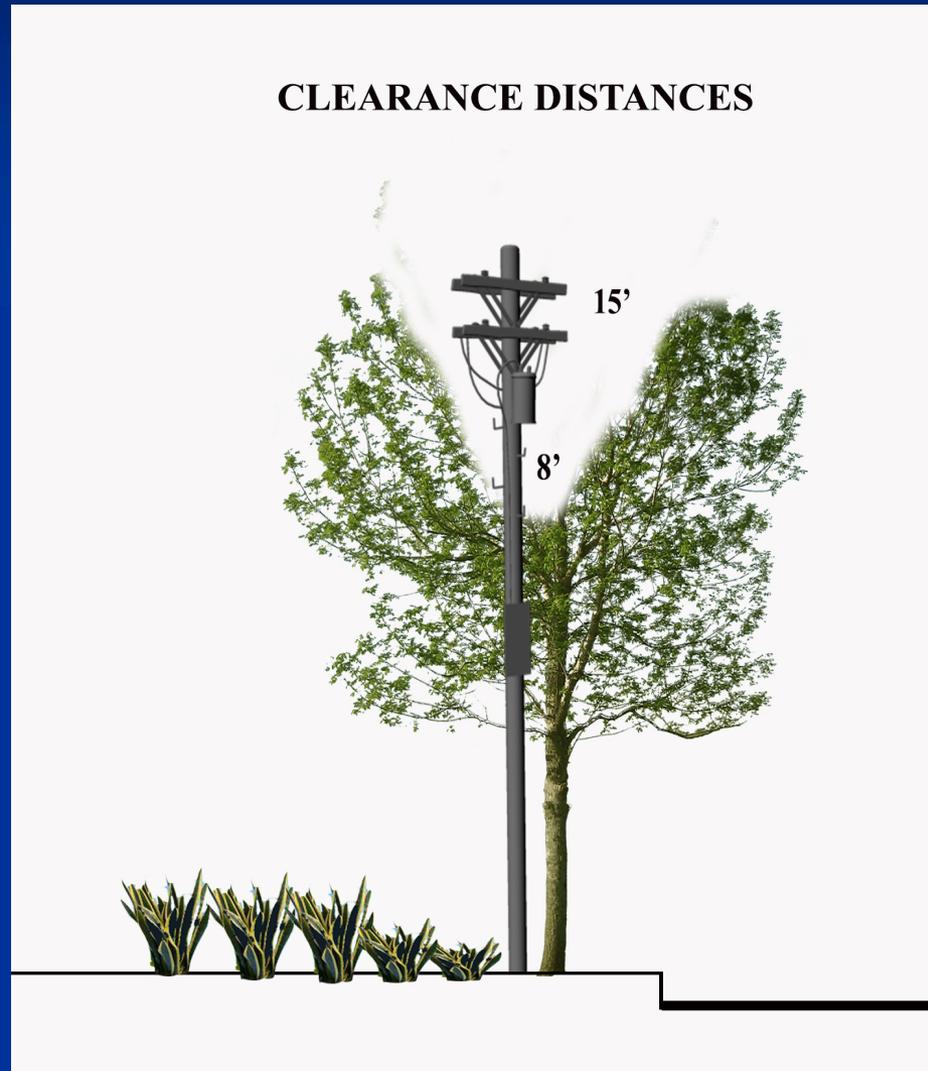
LOCAL STREET



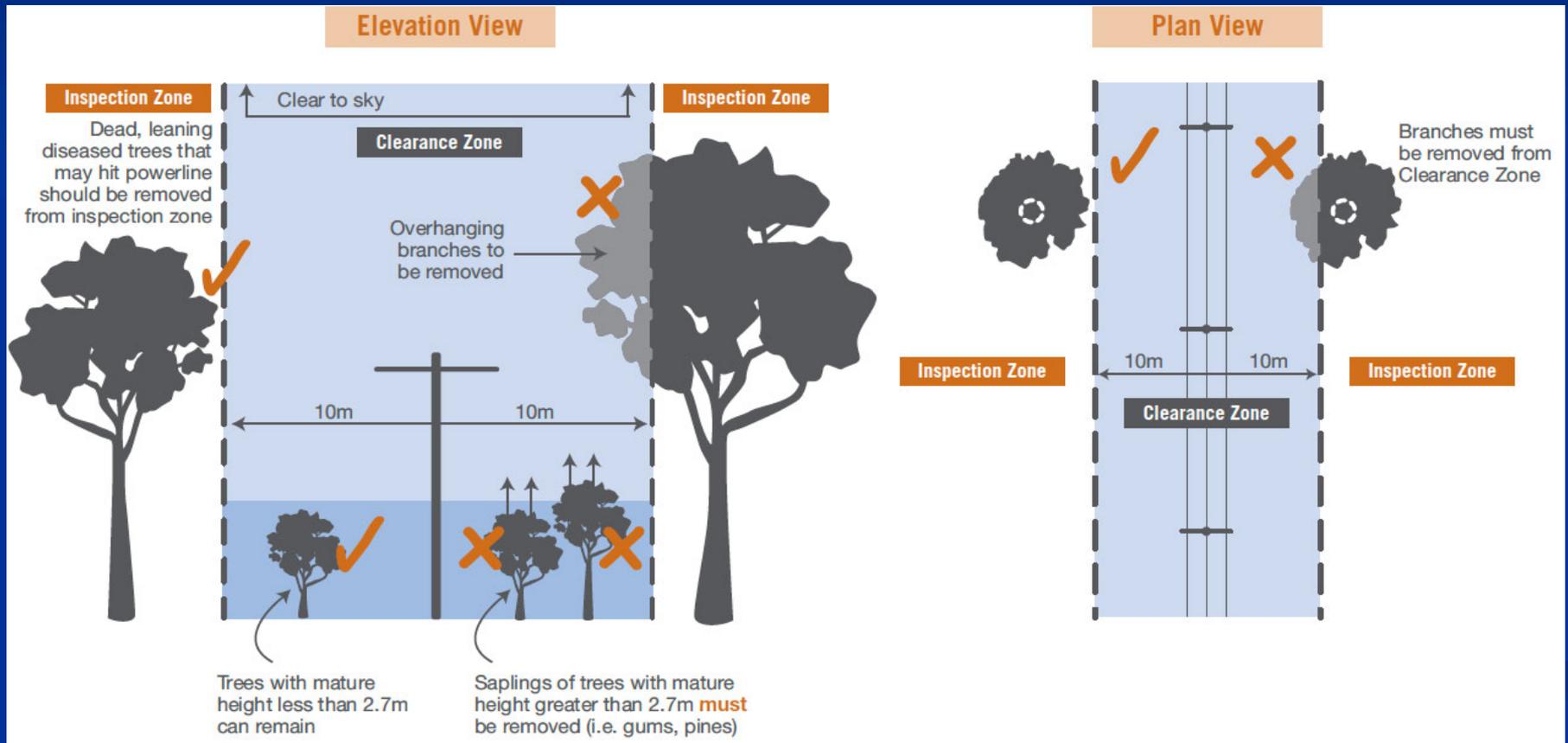
Streetscape design considerations



Streetscape design considerations



Streetscape design considerations



Streetscape design considerations



Streetscape design considerations



Streetscape design considerations



Streetscape design considerations



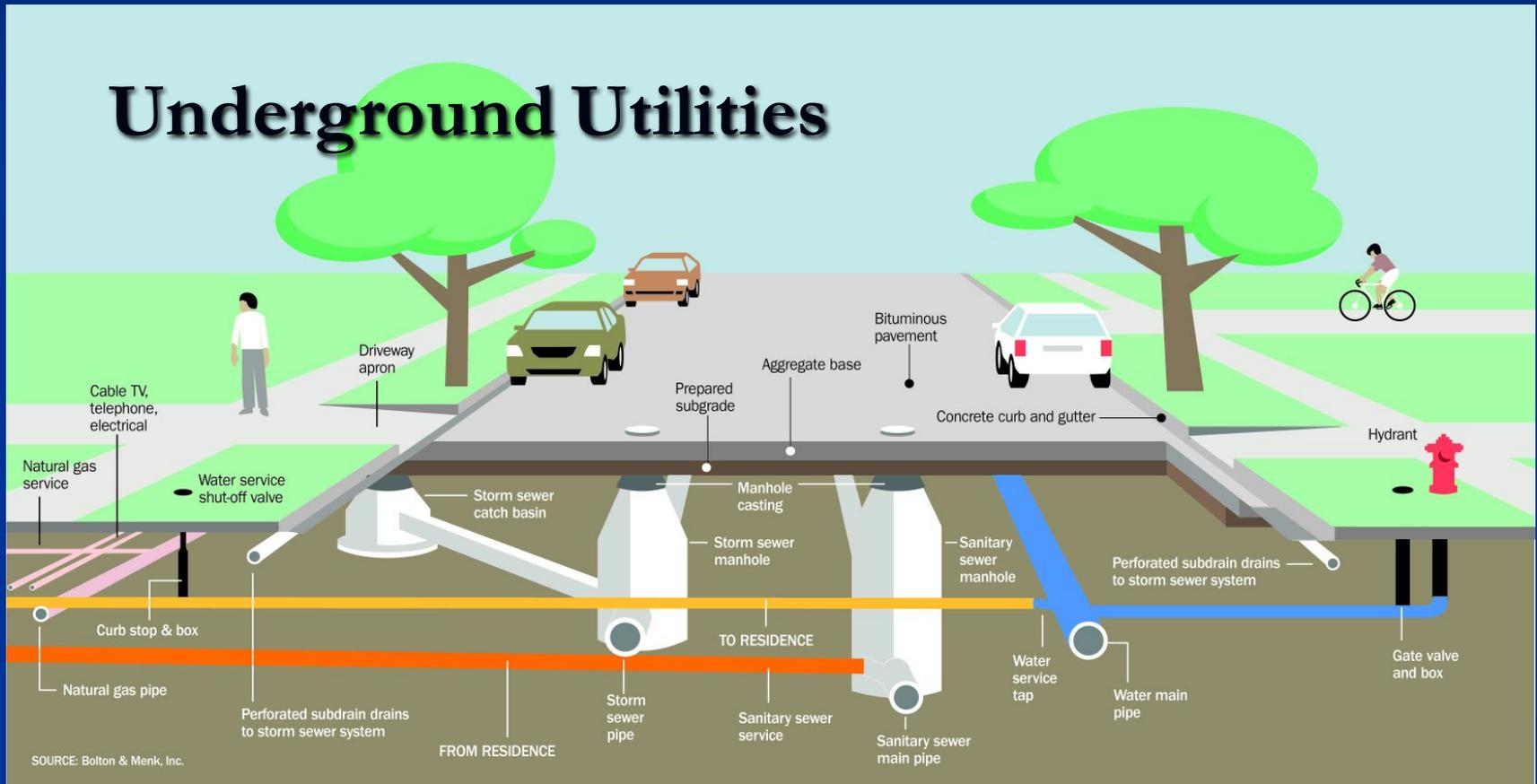
Streetscape design considerations



Streetscape design considerations



Streetscape design considerations

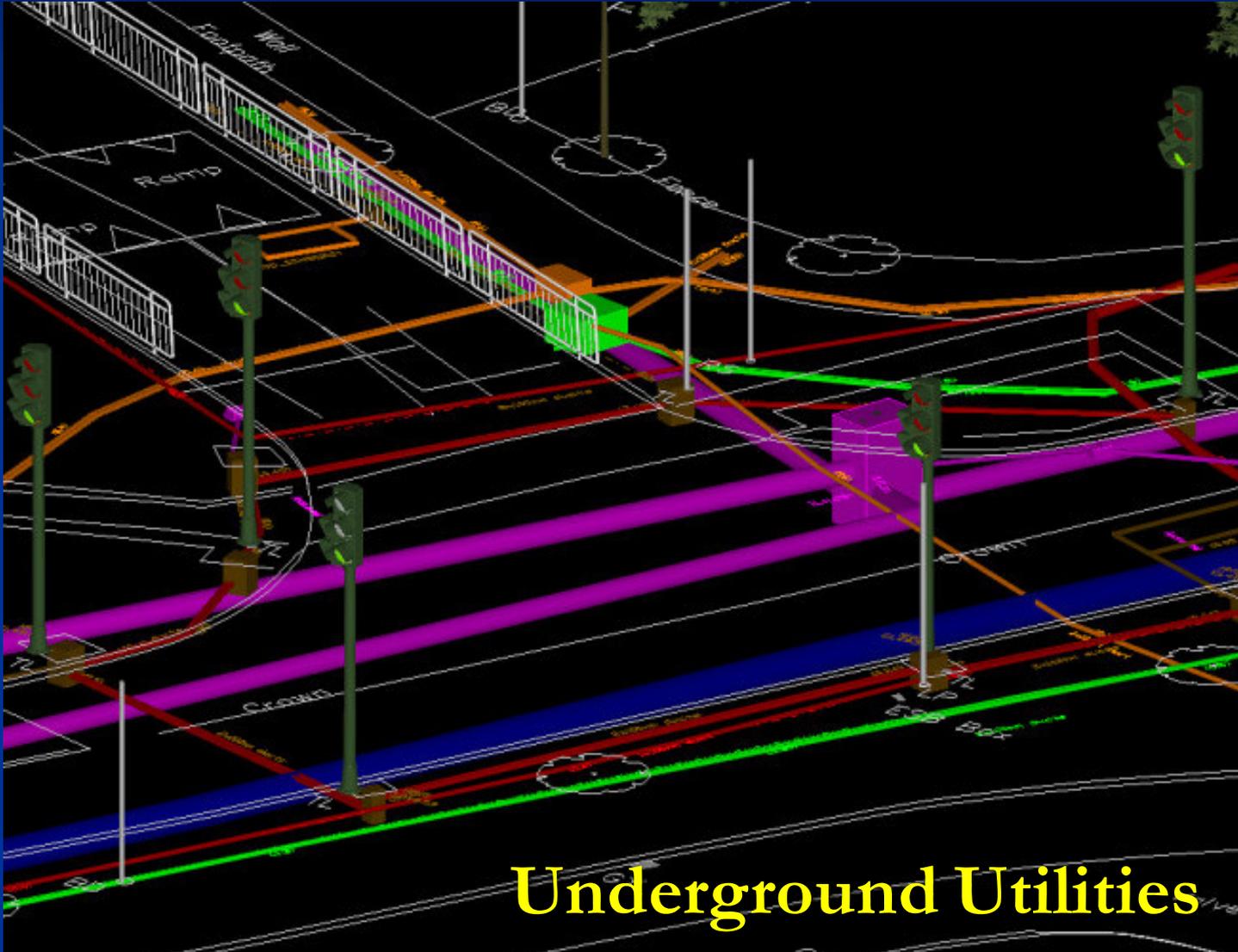


Streetscape design considerations

Underground Utilities



Streetscape design considerations



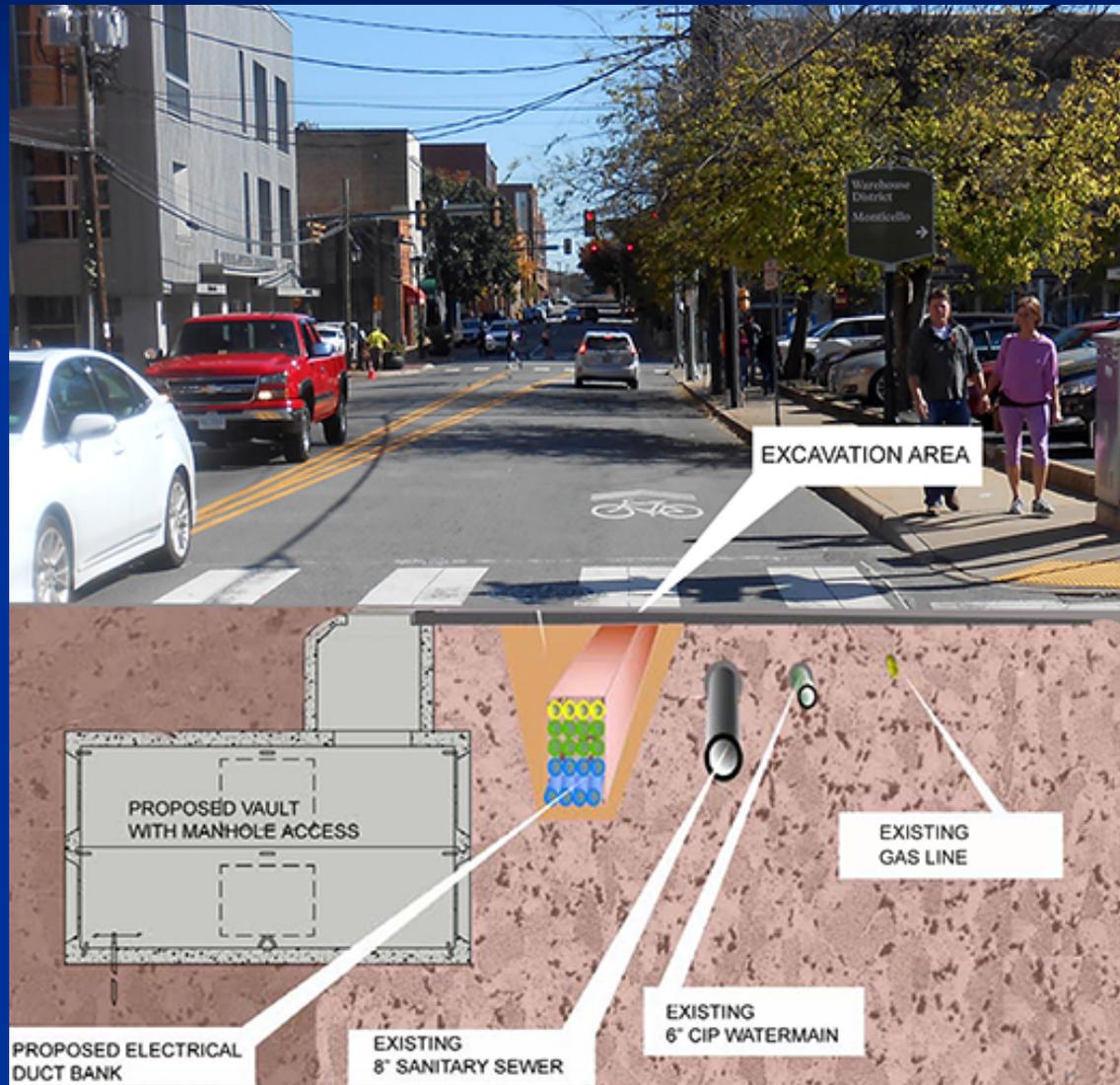
Streetscape design considerations



Streetscape design considerations

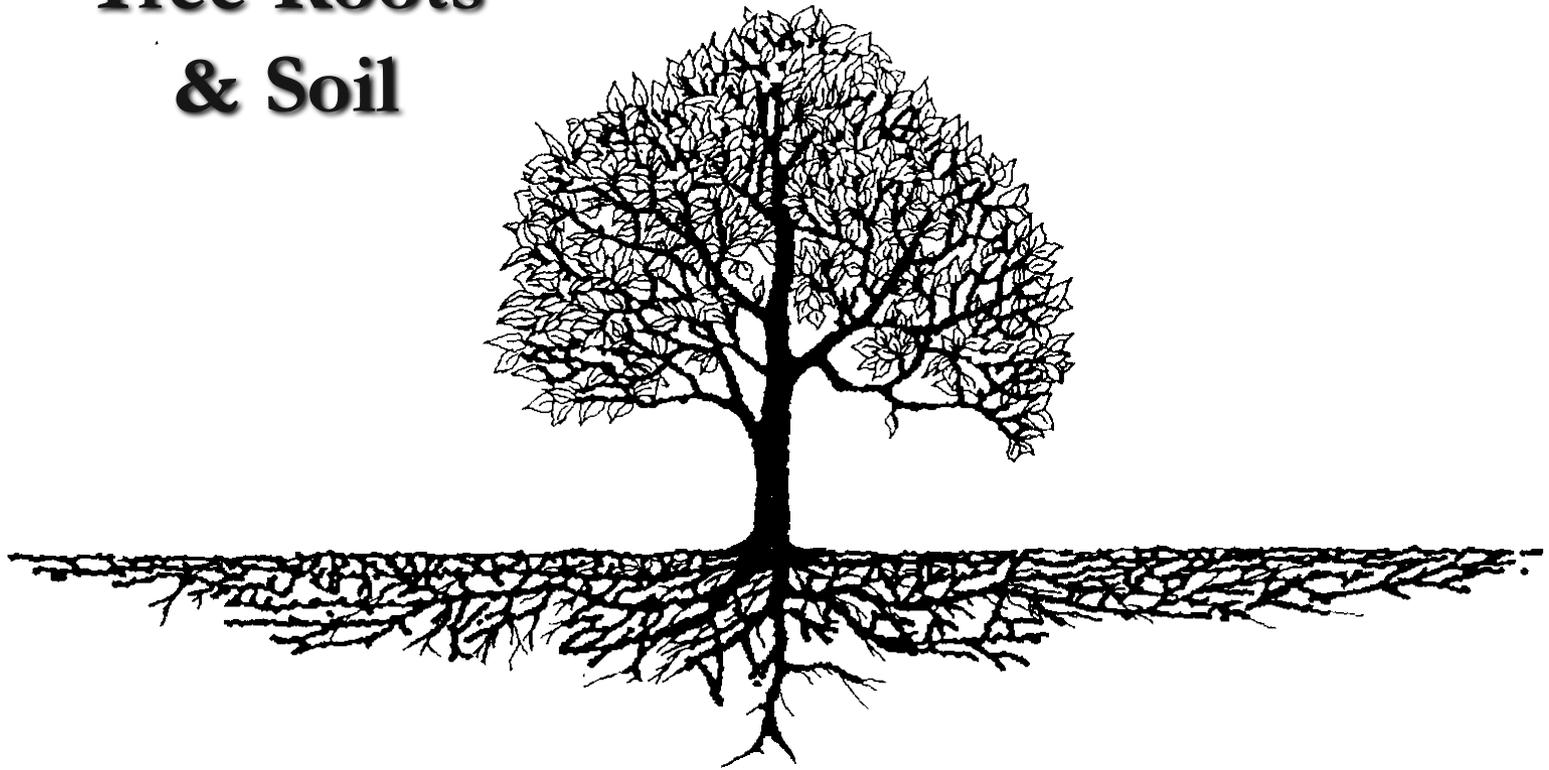


Streetscape design considerations



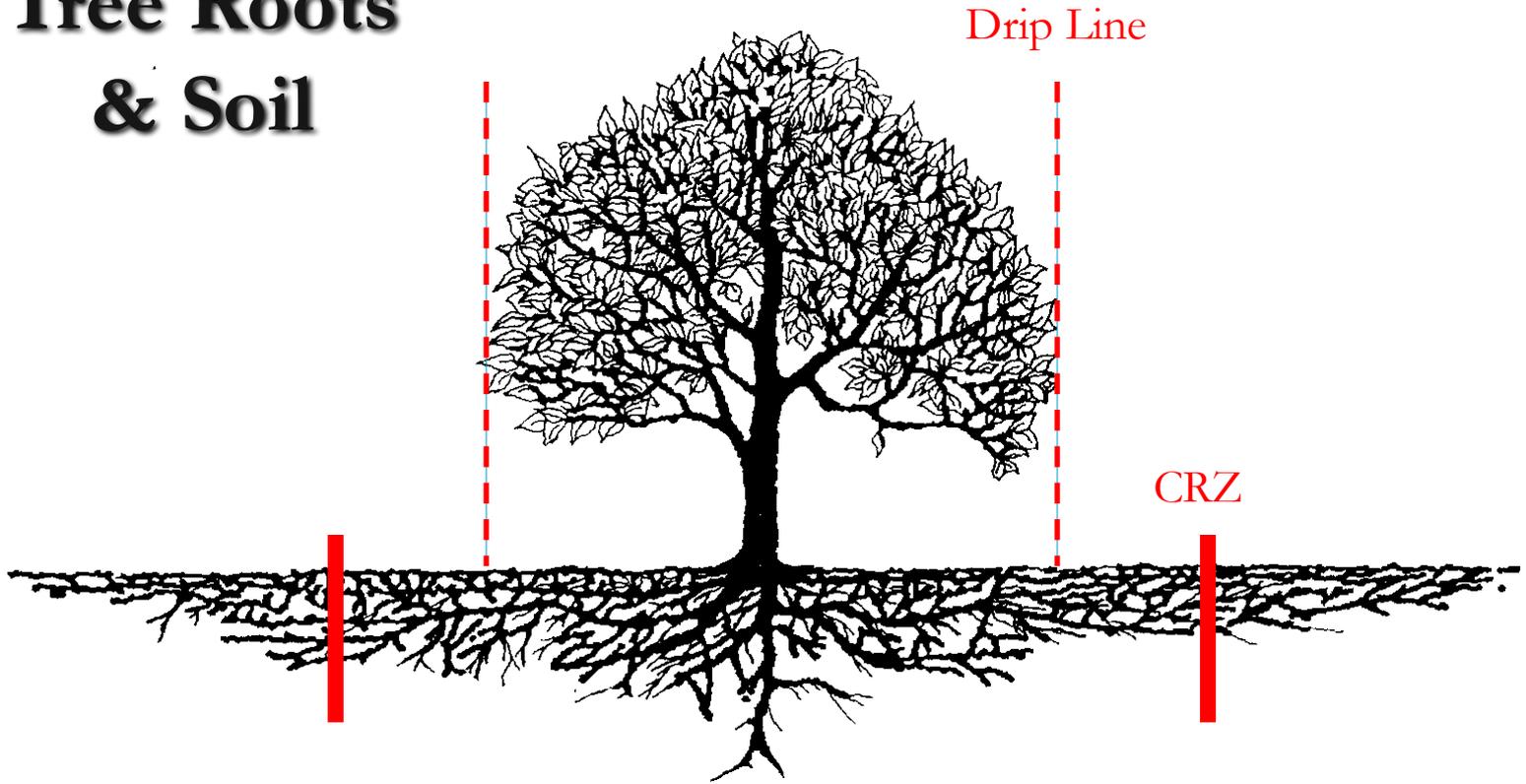
Streetscape design considerations

Tree Roots & Soil

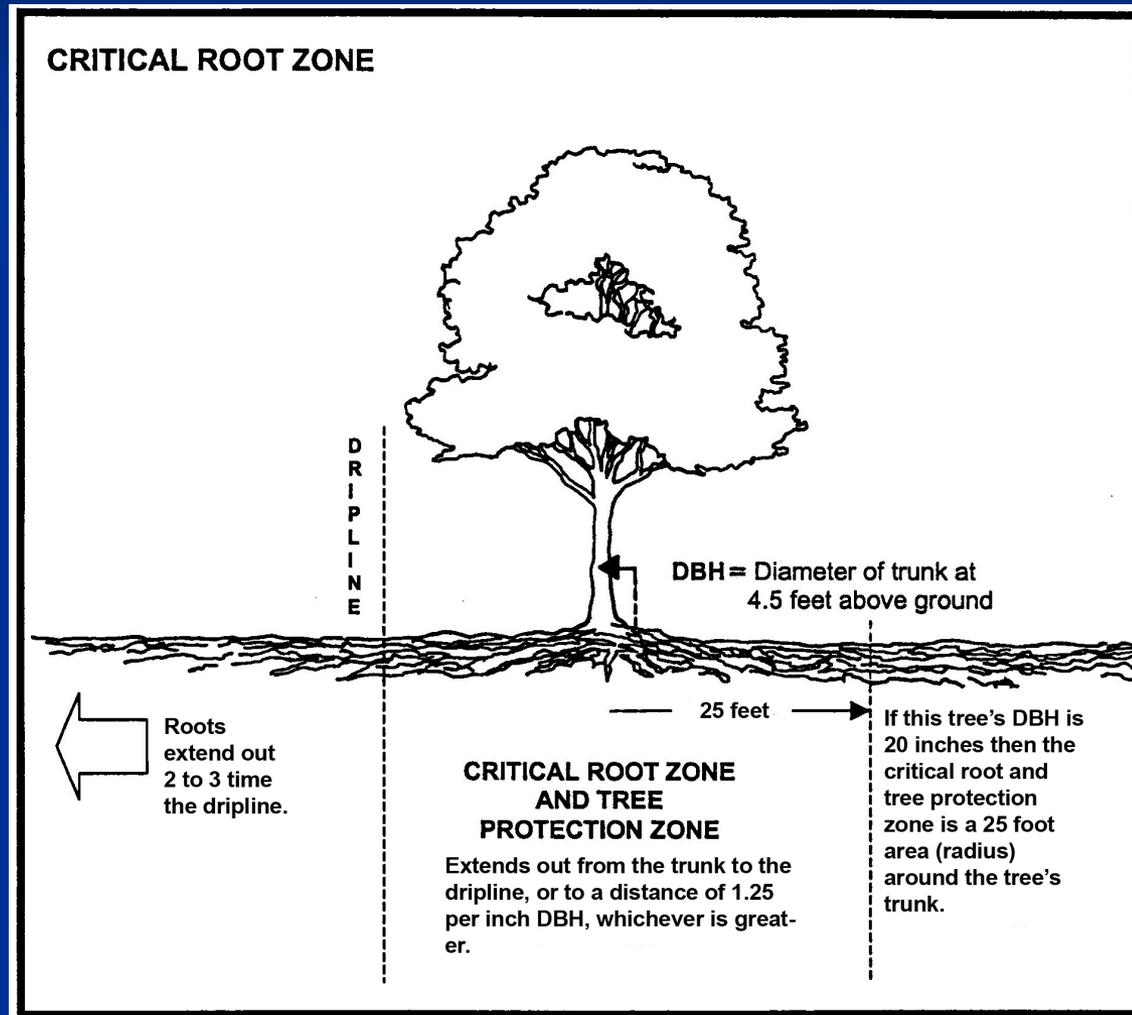


Streetscape design considerations

Tree Roots & Soil



Streetscape design considerations



Streetscape design considerations

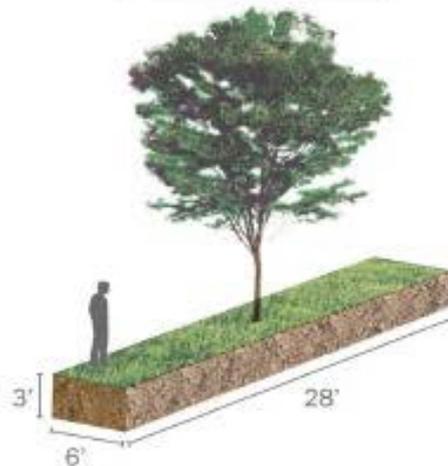
Soil Volume

estimated crown spread =
10 feet diameter



Soil Volume = 120 cubic feet

estimated crown spread =
21 feet diameter



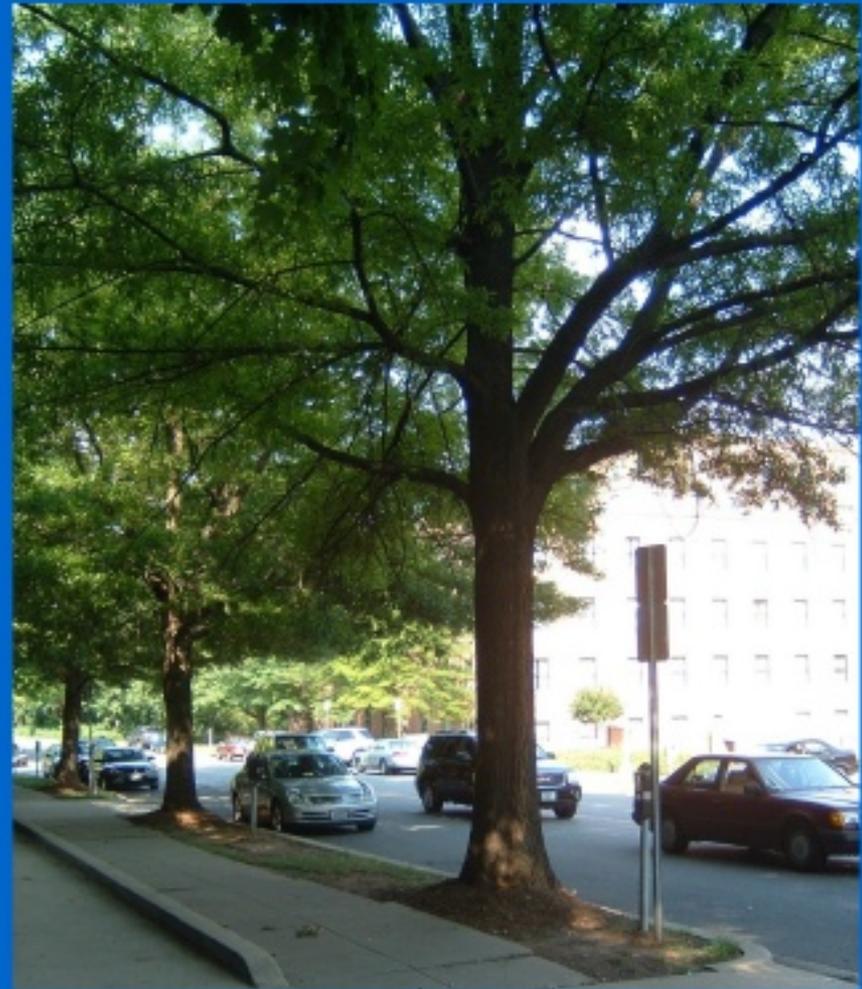
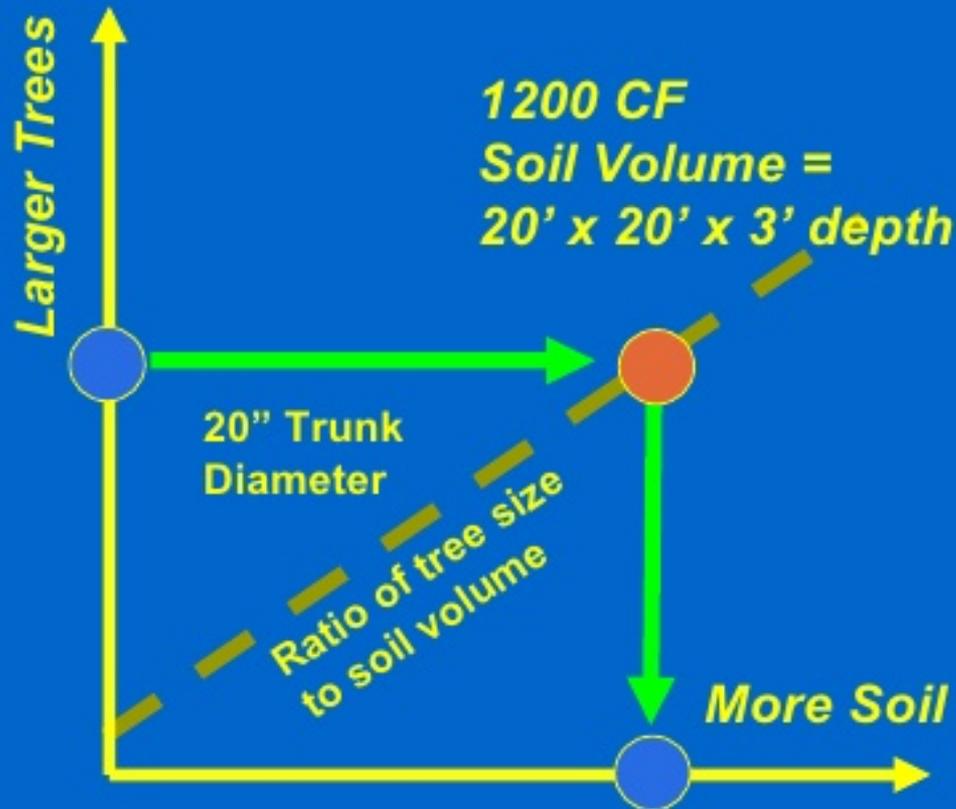
Soil Volume = 500 cubic feet

estimated crown spread =
30 feet diameter



Soil Volume = 1000 cubic feet

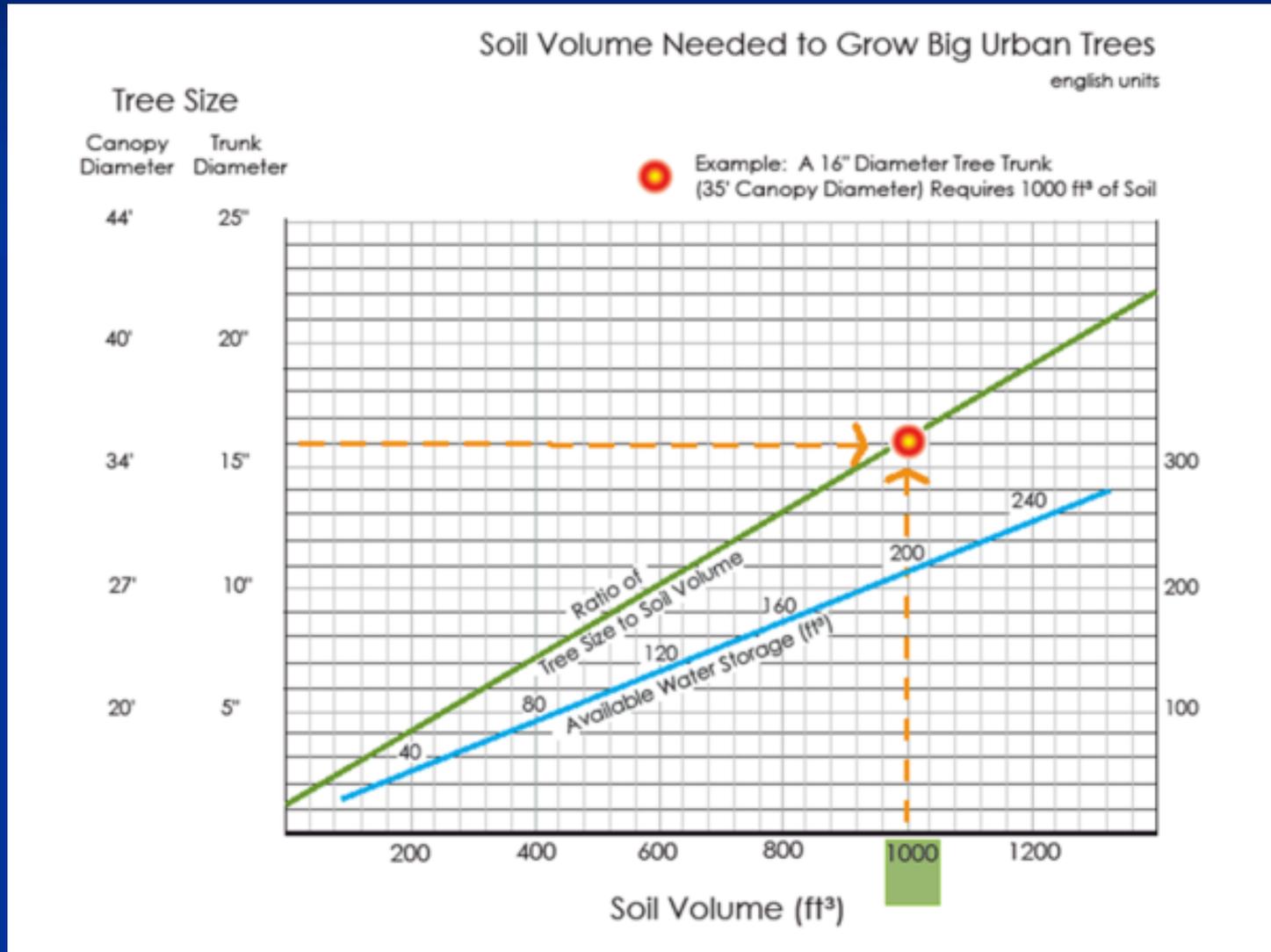
How Much Soil ?



JAMES URBAN, FASLA, ISA

**20" Trunk Diameter Tree will require
20' x 20' x 3' deep soil volume (min.).**

Streetscape design considerations



Streetscape design considerations

COLLECTOR STREET



Streetscape design considerations

COLLECTOR STREET



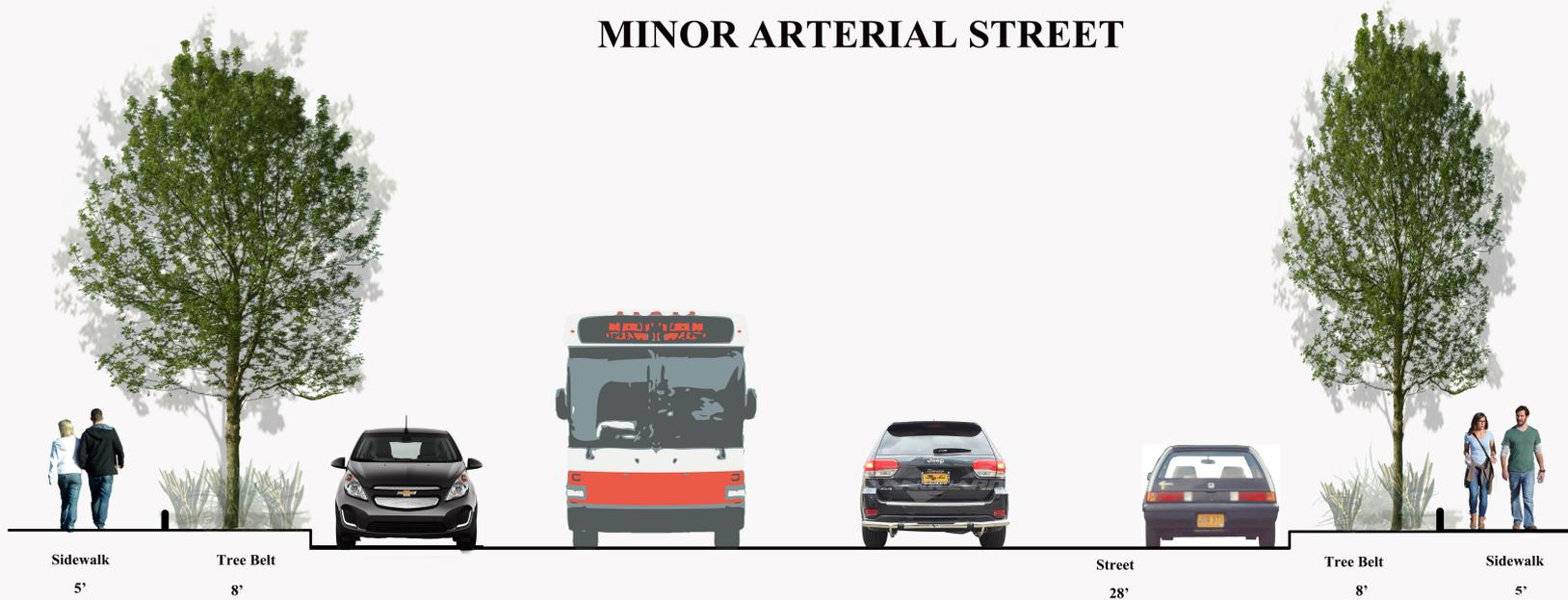
Streetscape design considerations

COLLECTOR STREET



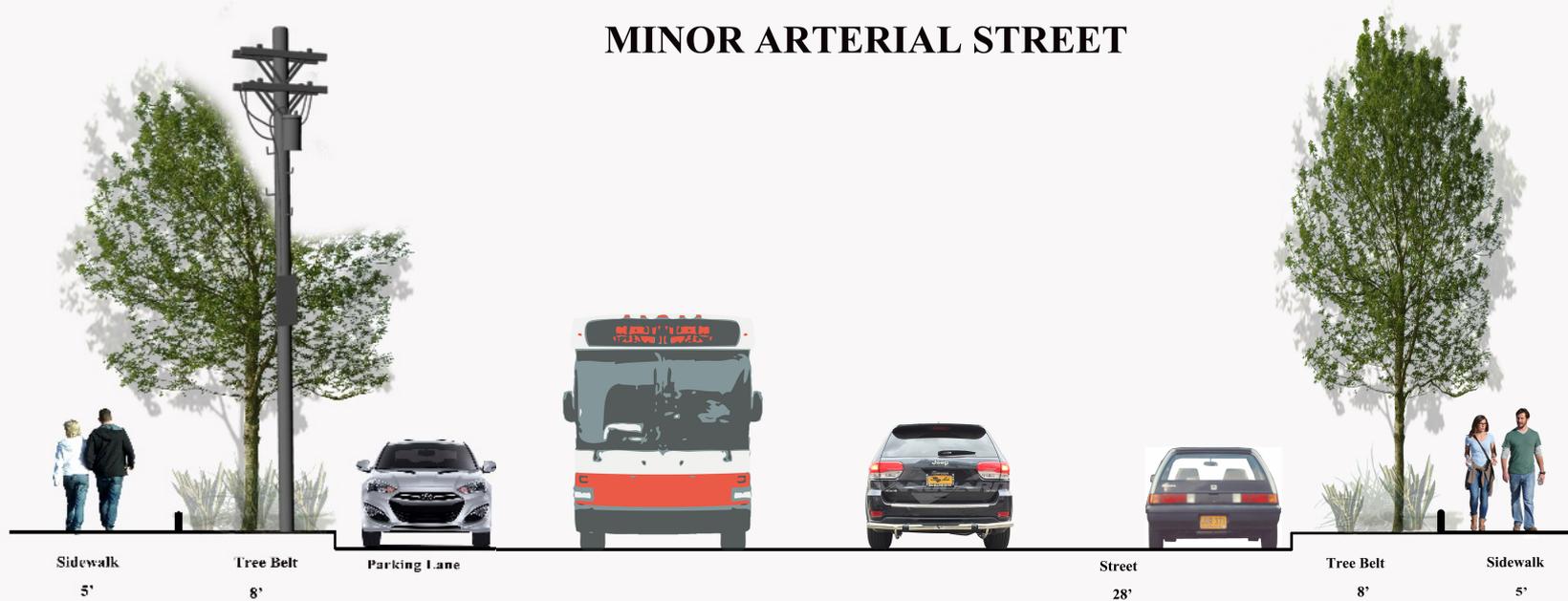
Streetscape design considerations

MINOR ARTERIAL STREET



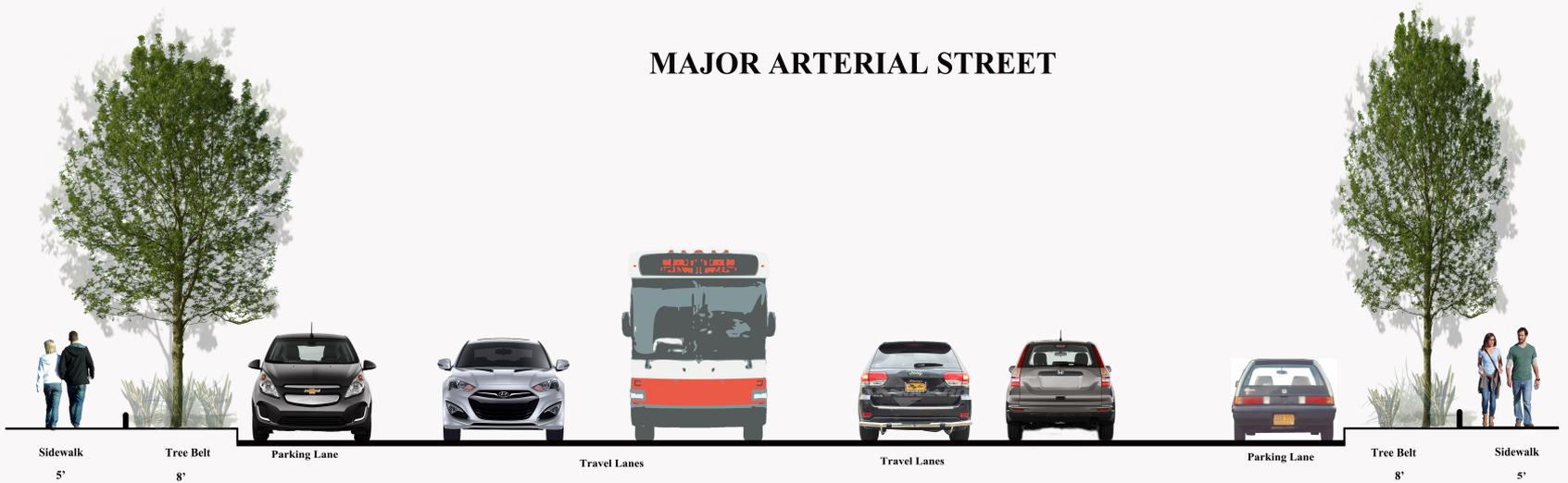
Streetscape design considerations

MINOR ARTERIAL STREET



Streetscape design considerations

MAJOR ARTERIAL STREET



Streetscape design considerations

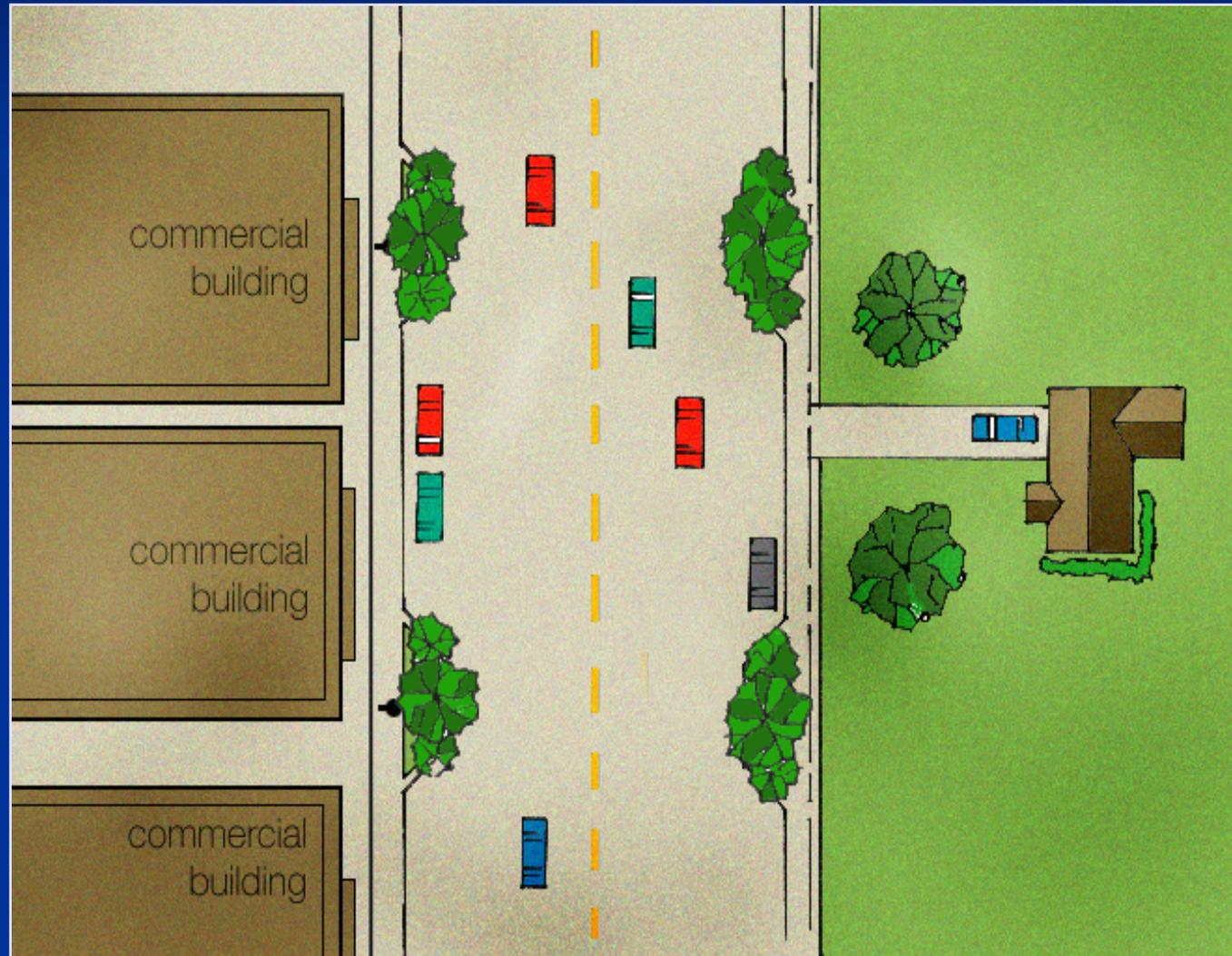
MAJOR ARTERIAL STREET



Consider These Alternatives

- Proper species selection, so that only trees that will not interfere with wires, building and other infrastructure.
- Setback planting appropriate species and shape
- Planting trees in locations within the right of way other than directly below the wires – bump out and terrace plantings.

Bump Out Planting



Bump Out Planting



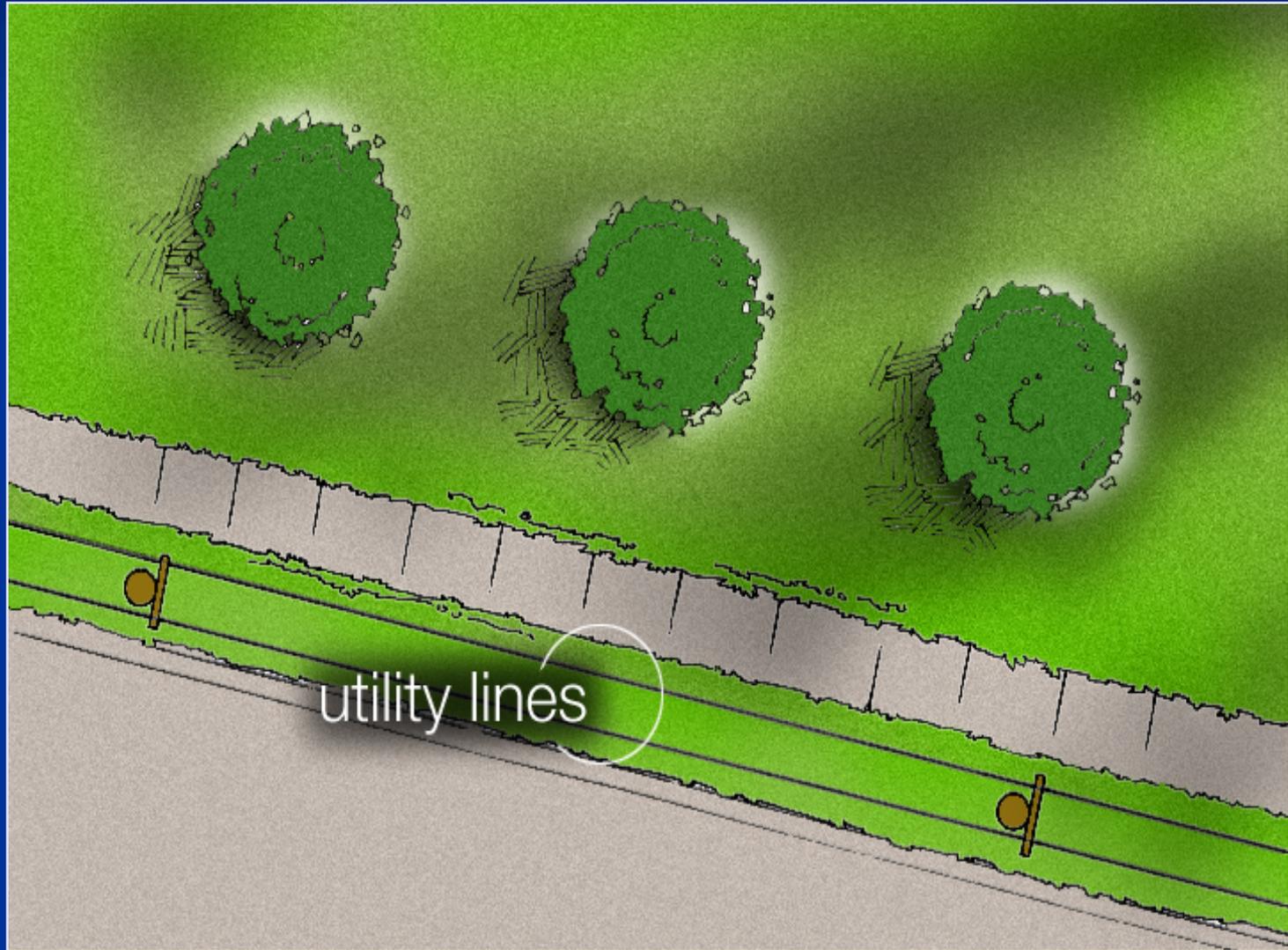
Bump Out Planting



Bump Out Planting



Set Back Planting



Set Back Planting



Set Back Planting



Set Back Planting



Set Back Planting



Space – Tree Species Match



Space – Tree Species Match



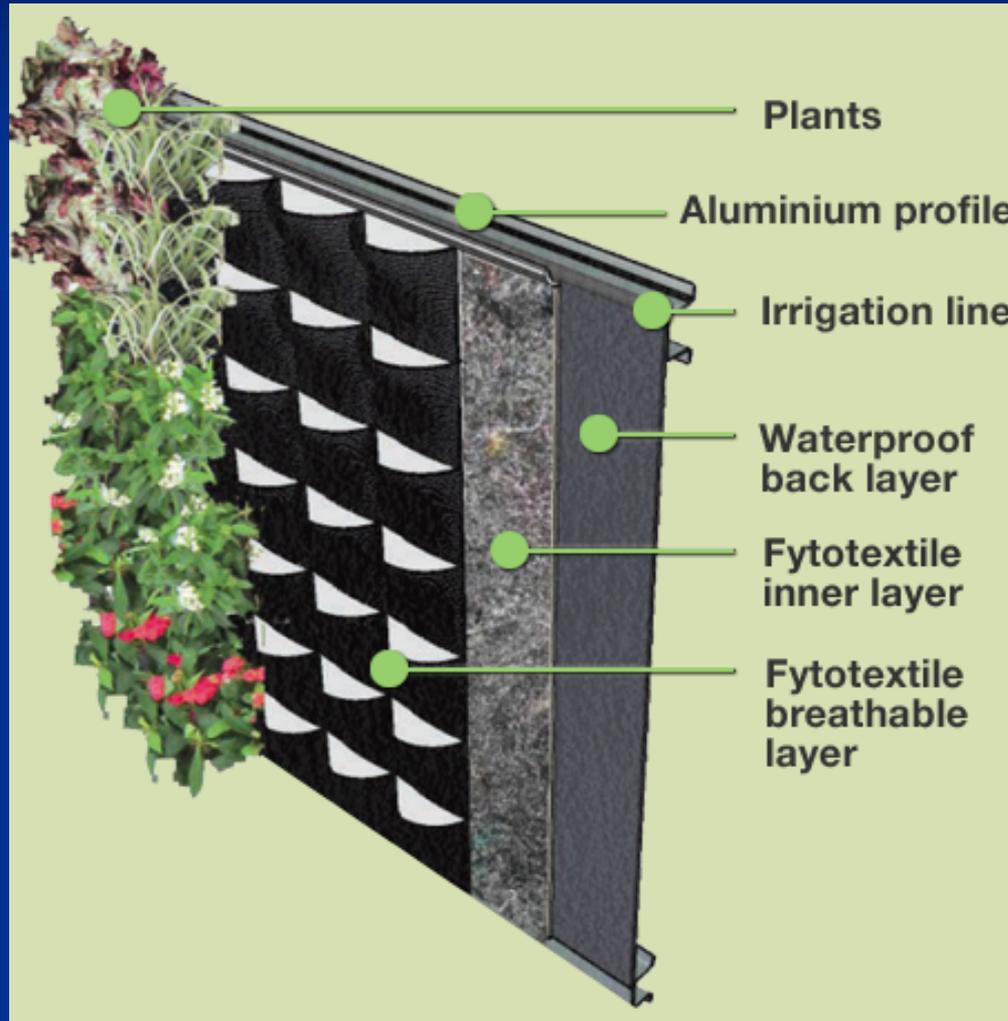
Be Creative



Be Creative



Be Creative









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