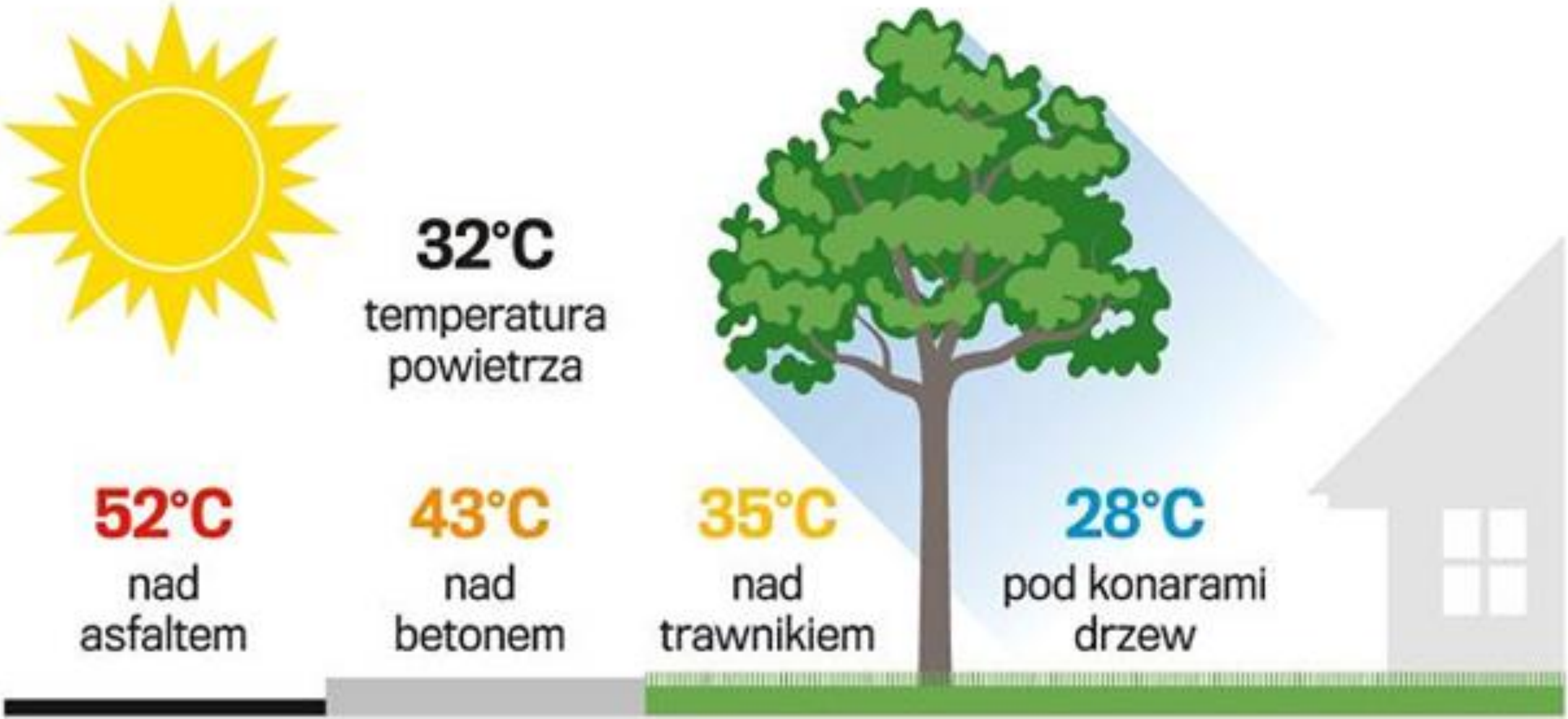
Przeciwdziałanie nagrzewaniu się miast, poprawa bioróżnorodności w miastach poprzez implementację w istniejącej strukturze miast rozwiązań opartych o naturę.

Wykład 4 - NBS

Narodowe Centrum Badań i Rozwoju
ERANet LAC
UNIWERSYTET WARSZAWSKI

WPŁYW DRZEW NA OBNIŻENIE TEMPERATURY W LECIE



https://www.facebook.com/drzewa.polski/photos/

PROCES OCZYSZCZANIA POWIETRZA PRZEZ DRZEWA

ZANIECZYSZCZONE POWIETRZE

OCZYSZCZONE POWIETRZE

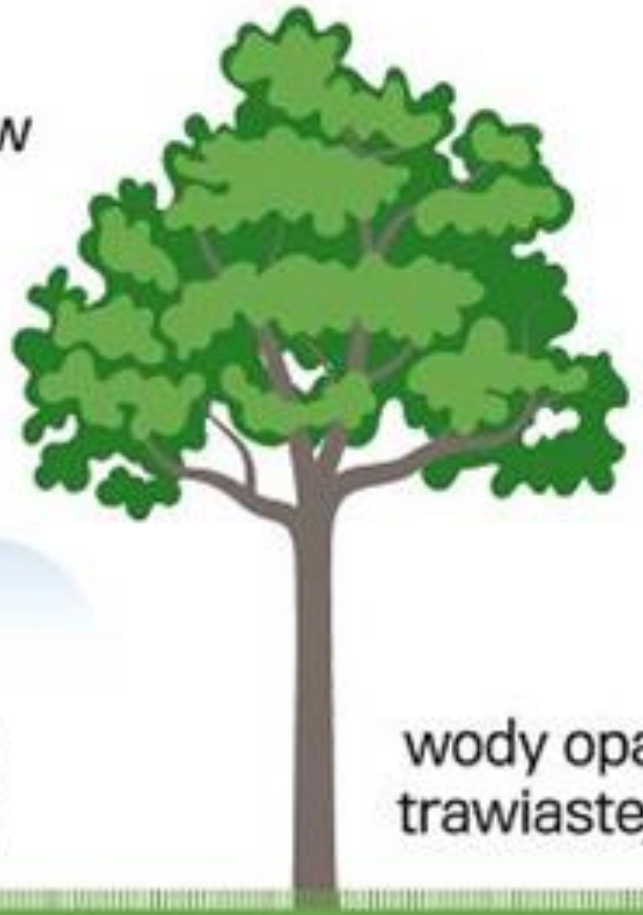
1. Podczas fotosyntezy razem z CO_2 pochłaniane są trujące gazy

2. Powierzchnia liści i parująca z nich woda zatrzymują cząsteczki kurzu

3. Deszcz zmywa z liści osadzone cząsteczki kurzu

ROLA DRZEW W OGRANICZENIU ODPŁYWU WÓD OPADOWYCH

1. Woda opadowa zatrzymuje się na liściach, co opóźnia tzw. odpływ szczytowy oraz zapobiega erozji powierzchni gleby. Część wody odparowuje, a niewielka ilość jest absorbowana przez drzewo



2. Spływająca z liści woda jest zatrzymywana w nierównościach gruntu utworzonych przez korzenie i w opadłych liściach

55%

wody opadowej z utwardzonych powierzchni spływa do kanalizacji

10%

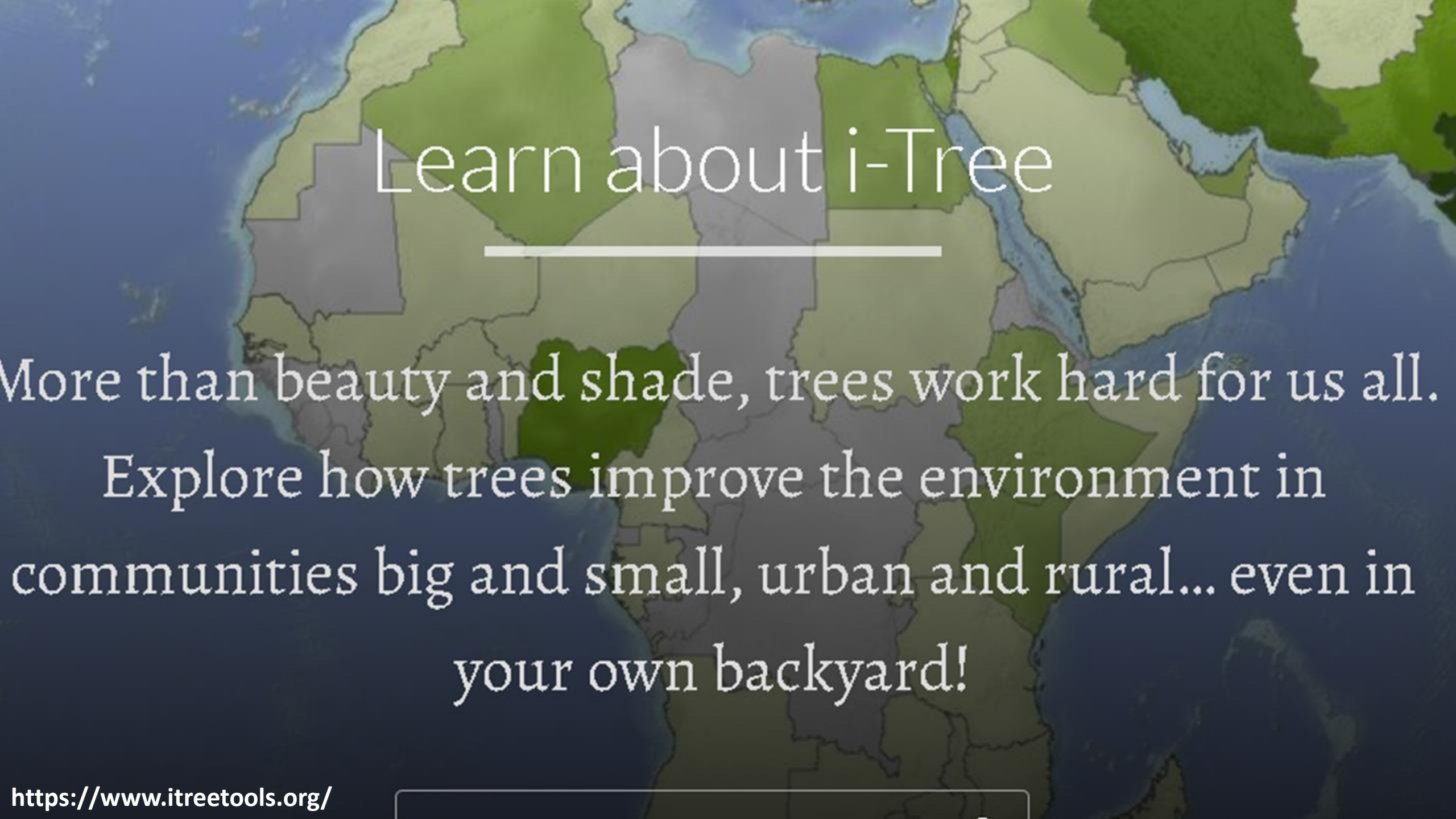
wody opadowej z powierzchni trawiastej spływa do kanalizacji

3. Korzenie pobierają wilgoć z gleby, zwiększając jej pojemność wodną

https://www.facebook.com/drzewa.polski/photos/

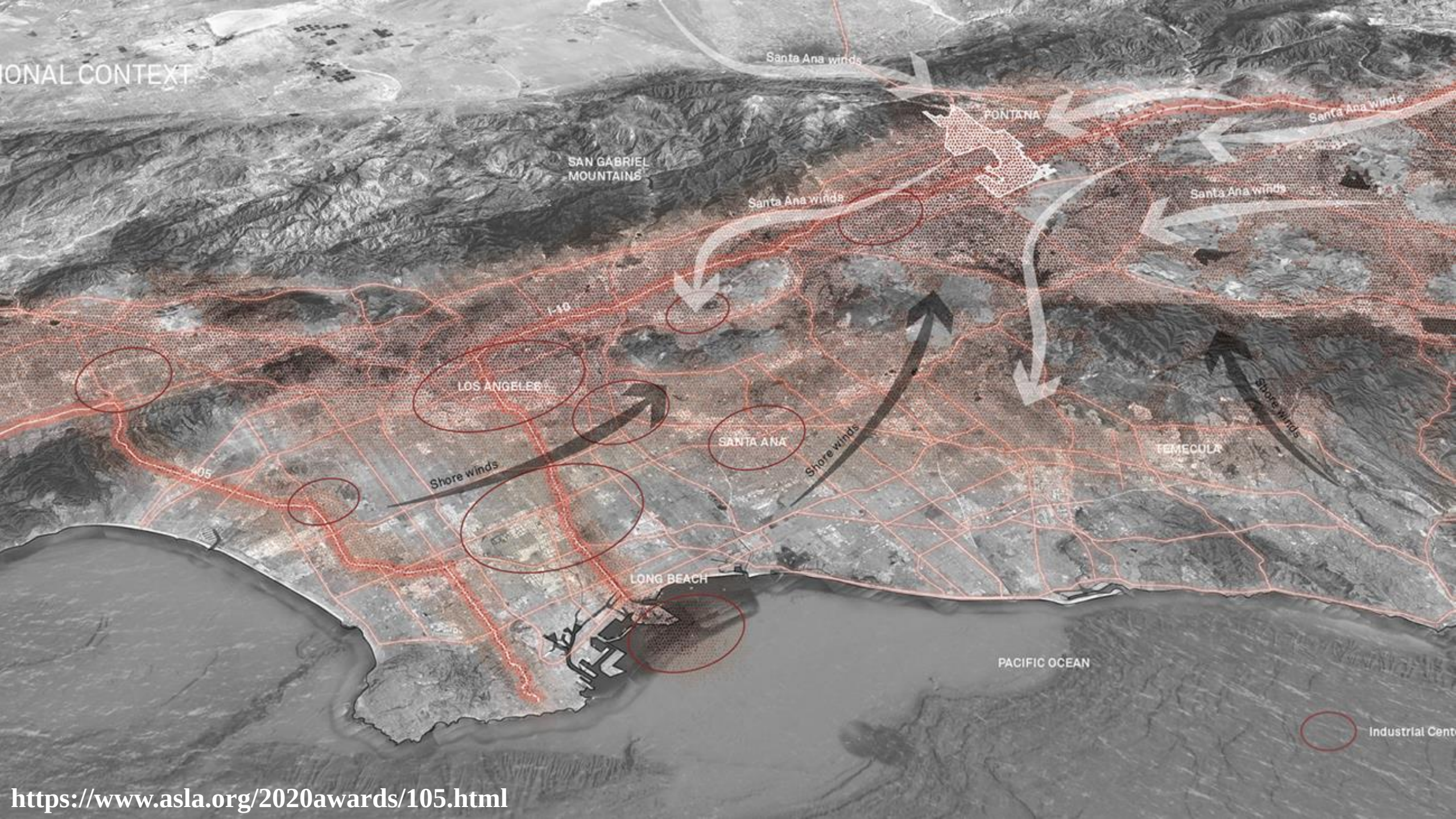
ŹRÓDŁO: „DRZEWA ZIELONY KAPITAŁ MIAST" H. B. SZCZEPANOWSKA I M. SITARSKI

https://www.nationalgeographic.com/news-features/urban-tree-canopy/



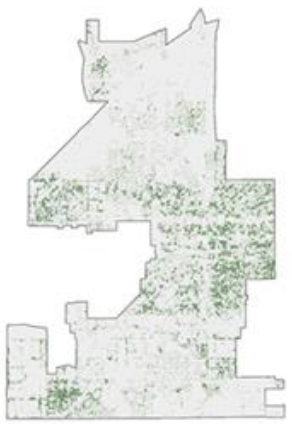
https://www.itreetools.org/


POLICIA



https://www.asla.org/2020awards/105.html

TREE CANOPY COMPARISON



0.36%

FONTANA

City Size: 43 mi²
Population: 214,238
Population/mi²: 4,982/mi²
Medium Household Income: $71,133

1.01%

RANCHO CUCAMONGA

City Size: 40 mi²
Population: 177,080
Population/mi²: 4,427/mi²
Medium Household Income: $87,357

1.62%

REDLANDS

City Size: 36 mi²
Population: 72,172
Population/mi²: 2,004/mi²
Medium Household Income: $74,993

5.39%

PASADENA

City Size: 23 mi²
Population: 144,929
Population/mi²: 6,301/mi²
Medium Household Income: $84,613

26.54%

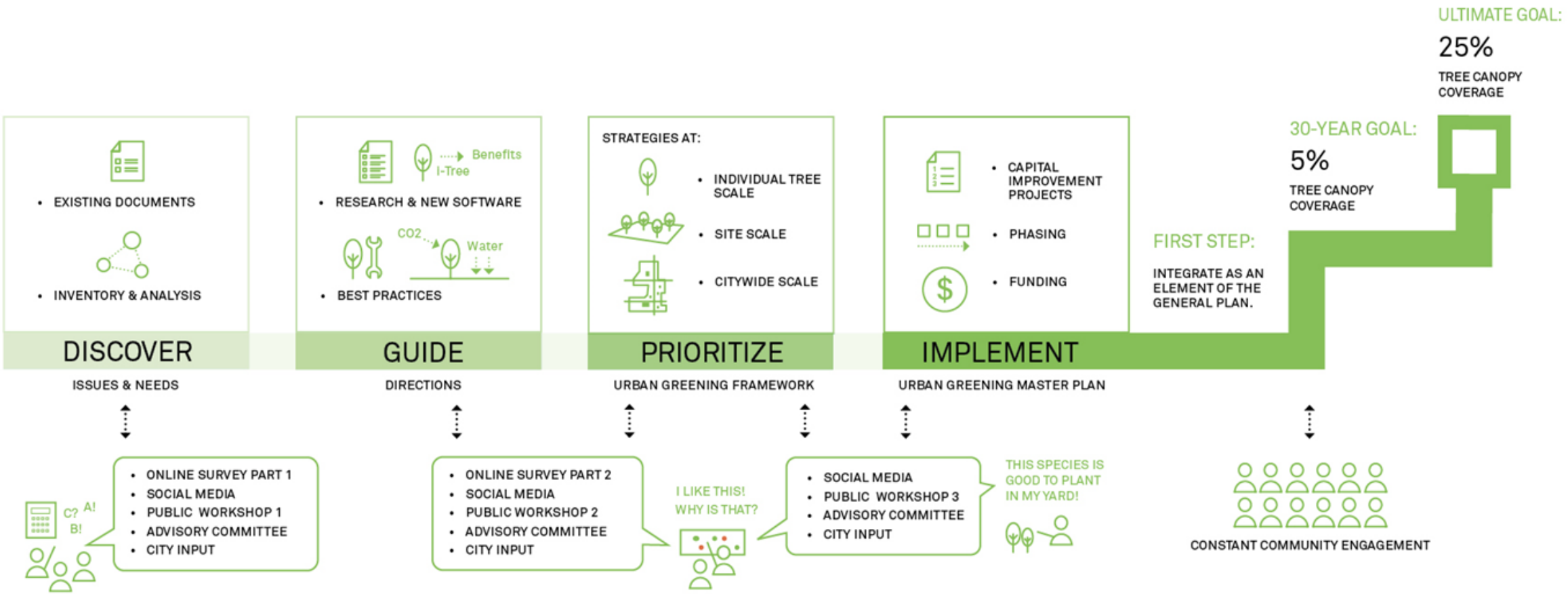
BEVERLY HILLS

City Size: 5.7 mi²
Population: 35,447
Population/mi²: 6,219/mi²
Medium Household Income: $112,107

Note: Green dots represent existing tree canopy.
Source: i-tree landscape

https://www.asla.org/2020awards/105.html

PROCESS

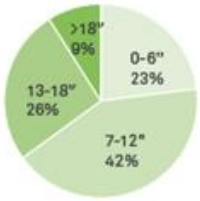


https://www.asla.org/2020awards/105.html

DISCOVER ISSUES & NEEDS

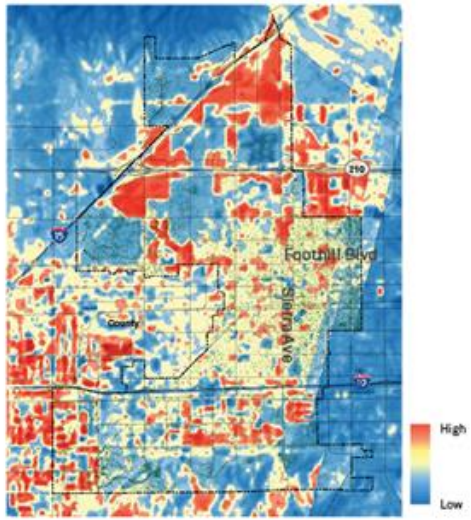
EXISTING TREE CANOPY

Tree population is young.



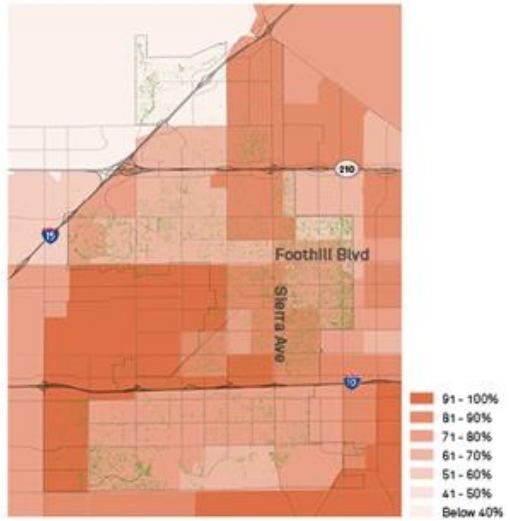
0.3%

Of street trees in Fontana are larger than 31' DBH.



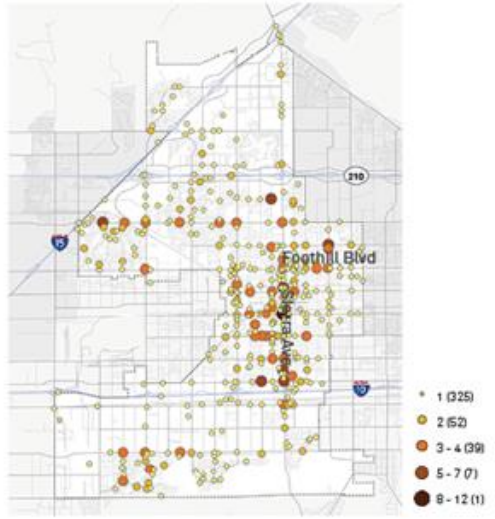
LAND SURFACE TEMPERATURE

Land surface temperature is increased with the density of urban built-up and barren land, but decreased with vegetation cover.



CALENVIROSCREEN 3.0 RESULTS

CalEnviroScreen uses environmental, health, and socioeconomic information to produce scores. An area with a high score is one that experiences a much higher pollution burden than areas with low scores.



PEDESTRIAN & BICYCLIST COLLISIONS

One of the goals in this plan is to promote active transportation. Streets with the most severe collision condition are prioritized for street redesign to be greener, safer for all types of transportation modes.

https://www.asla.org/2020awards/105.html

COMMUNITY ENGAGEMENT

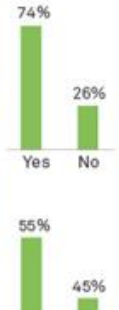
COMMUNITY WORKSHOPS

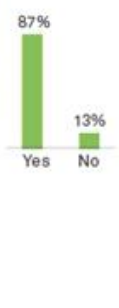
DOTTING EXERCISE

TREE PALETTE

ONLINE SURVEYS

VISUAL PREFERENCE





SAMPLE QUESTIONS

I see the greatest benefits of Fontana's urban greening plan to be (Pick 4)?

Answer Choices	Responses
A more beautiful city	282
Conservation of water	137
Establishment of habitat for wildlife	87
Improve air quality	173
Providing a more comfortable public realm	170
Getting people to walk and bike more	159
Attraction and retention of retail and restaurants	223
Reducing temperatures	61

Total Participants: 335

Where should the City start Urban Greening?

Answer Choices	Responses
Downtown	18
Sierra Avenue between I-10 and the 210 Freeway	40
Foothill Boulevard	15
The Pacific Electrical Rail Corridor	12
Existing neighborhoods	42
New neighborhoods / areas under construction	13
All commercial areas	13
Along the freeways	12
Near schools	21
Other	18

Total Participants: 204

SOCIAL MEDIA POSTS

BILINGUAL POSTERS

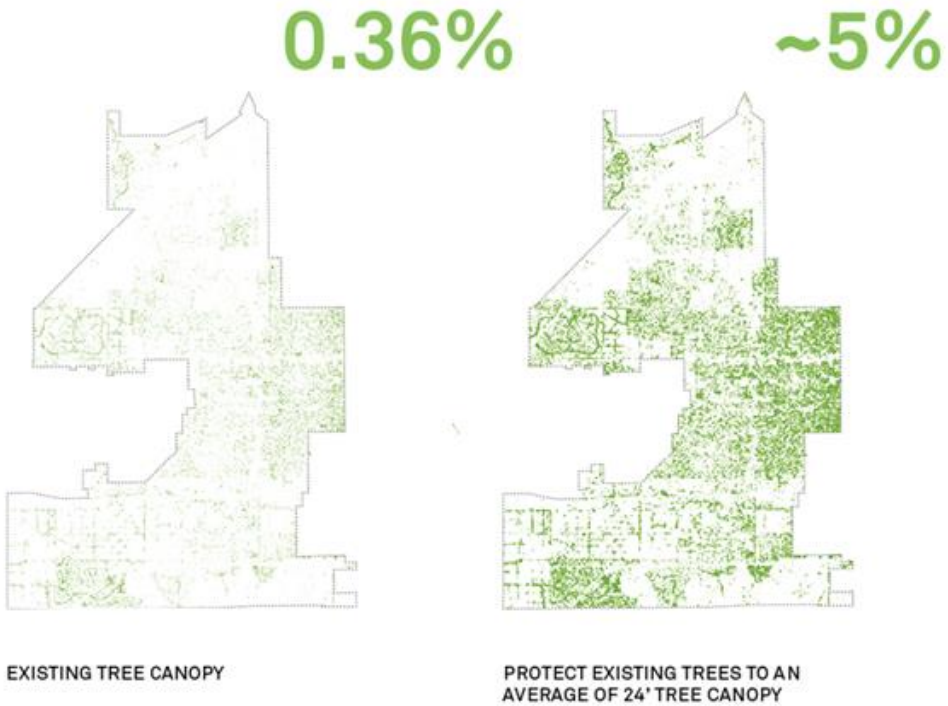
https://www.asla.org/2020awards/105.html

EXISTING TREE PRESERVATION

ONE CANARY ISLAND PINE

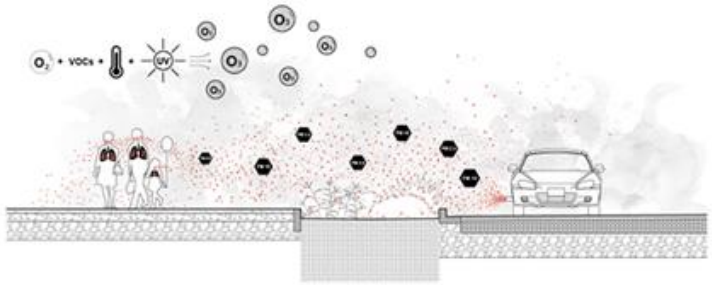
IN SINGLE FAMILY RESIDENTIAL

WHAT IF FONTANA JUST PROTECT ALL EXISTING TREES WITHOUT NEW TREE PLANTING?

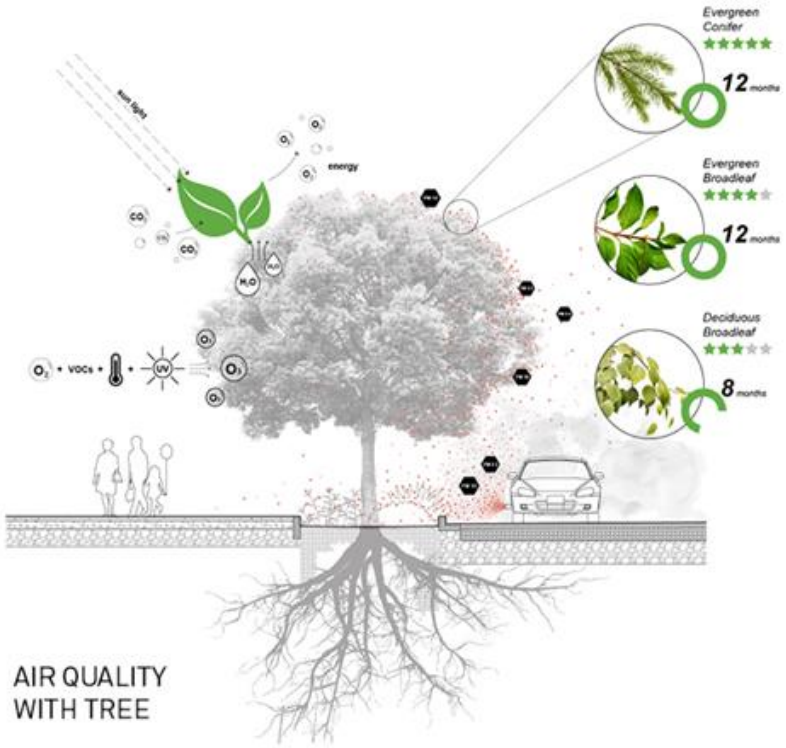


https://www.asla.org/2020awards/105.html

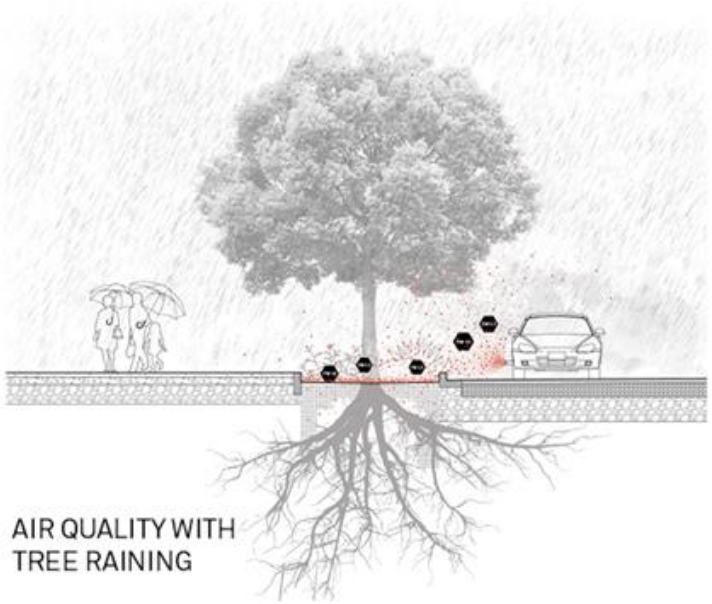
URBAN GREENING AND AIR QUALITY STUDY



AIR QUALITY
WITH NO TREE

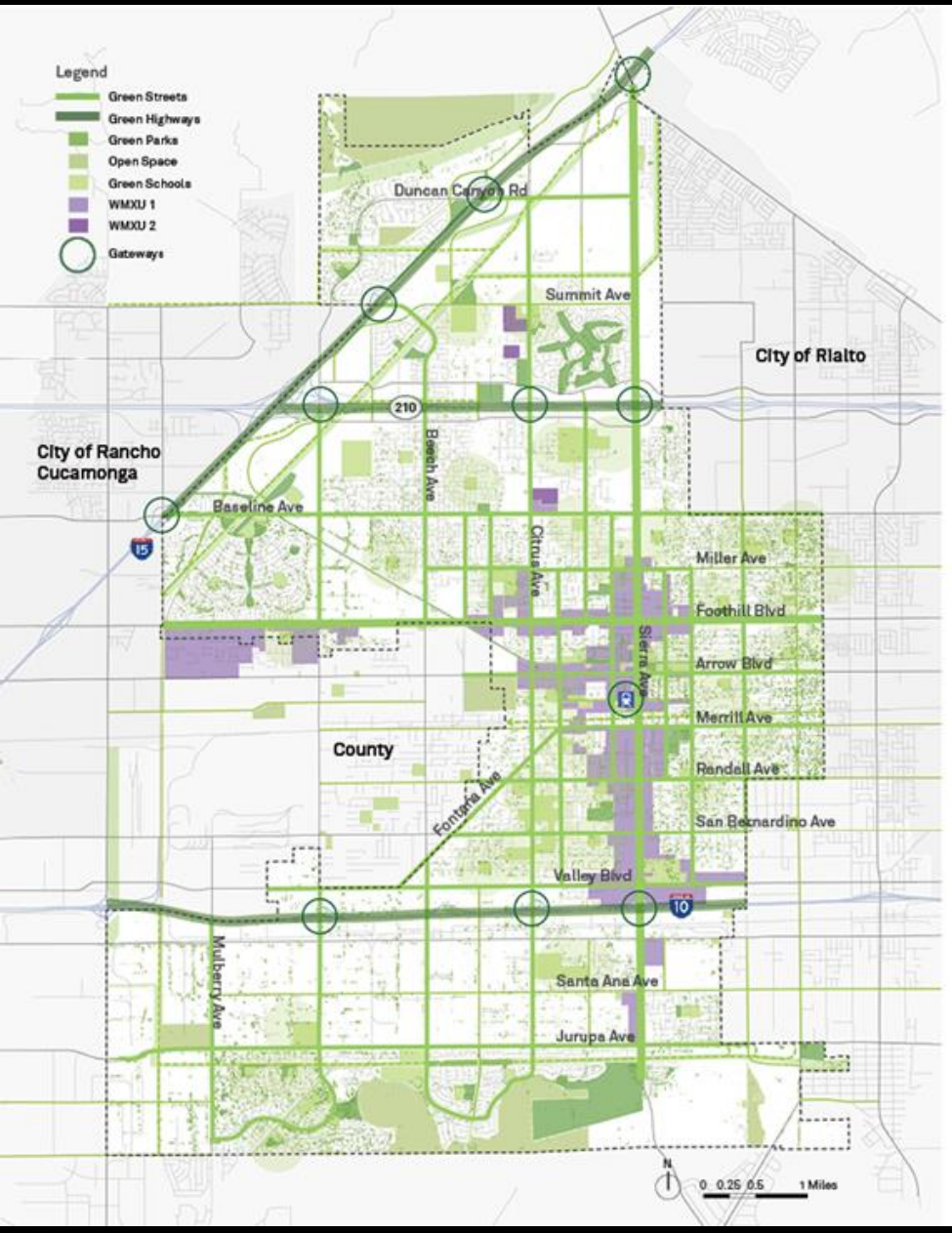


AIR QUALITY
WITH TREE



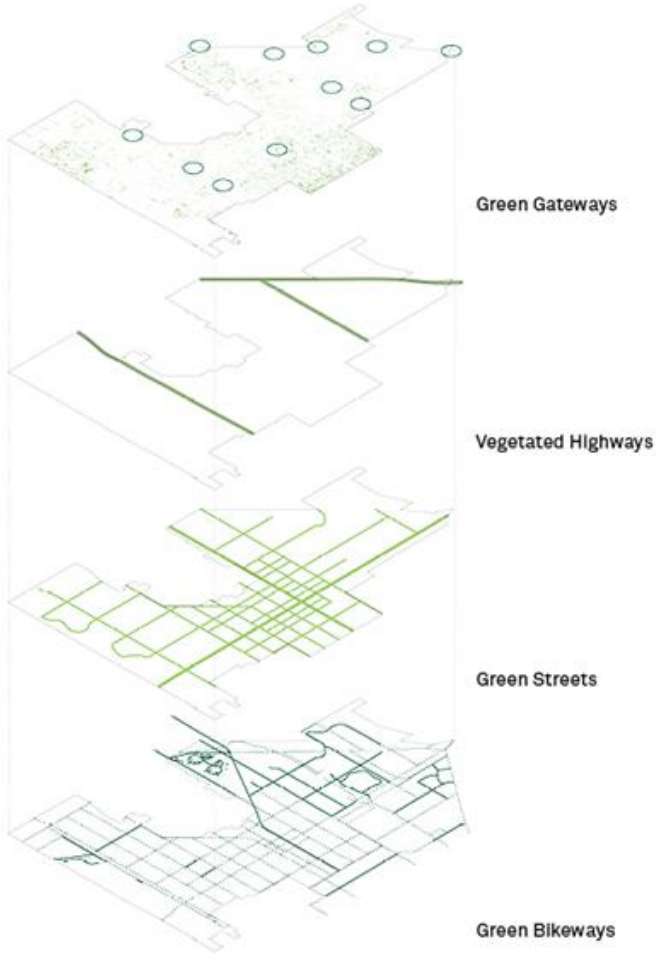
AIR QUALITY WITH
TREE RAINING

https://www.asla.org/2020awards/105.html



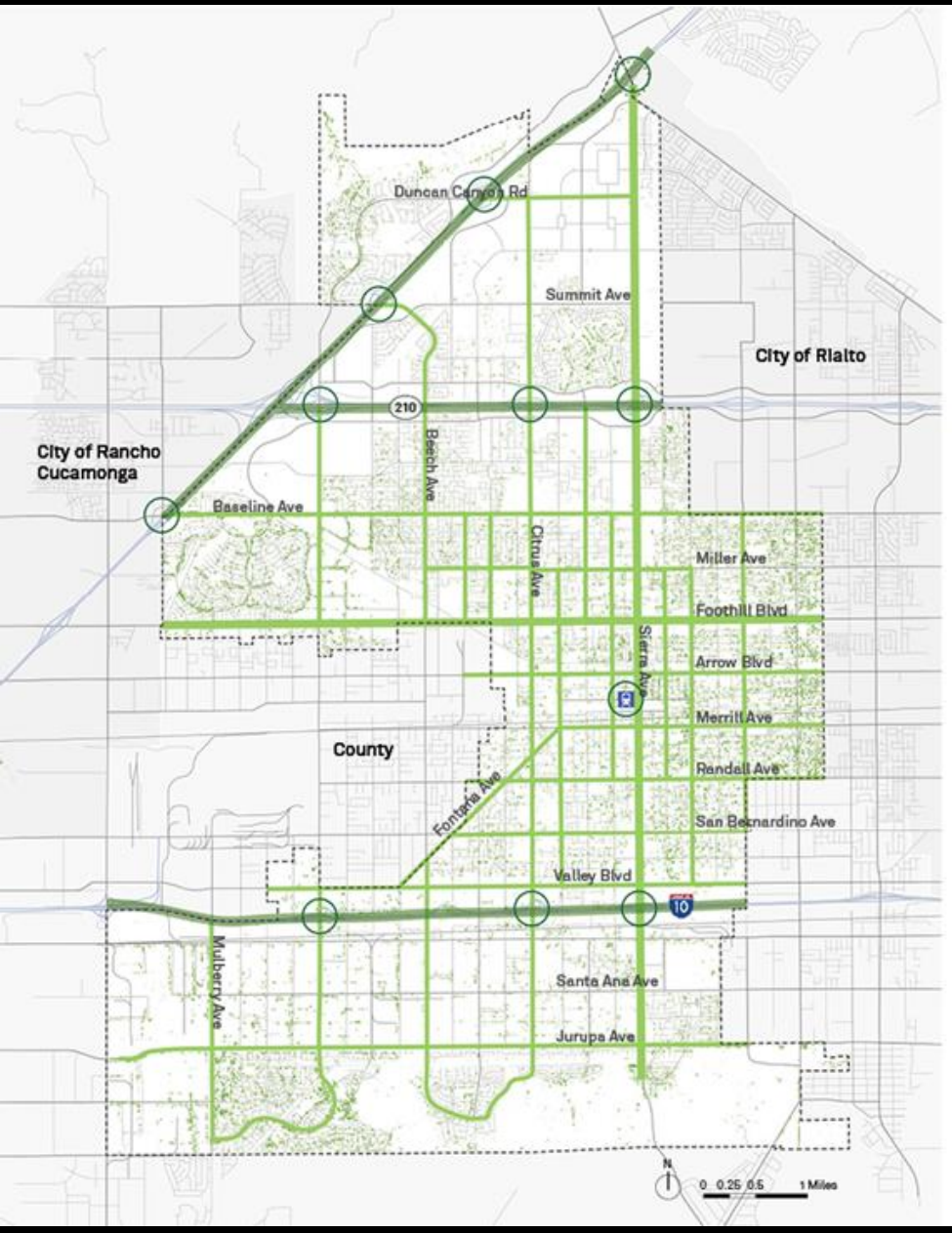
URBAN GREENING FRAMEWORK

GREEN STREETS



GREEN PLACES

https://www.asla.org/2020awards/105.html



GREEN STREETS

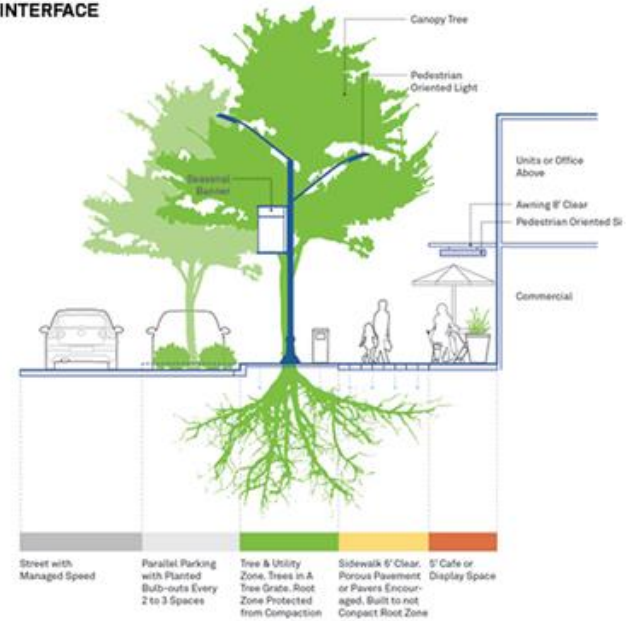
THE CITY MAINTAINS
497 MILES OF STREETS

ASSUMPTION
2,500 SQFT
PER 100 FT OF STREET

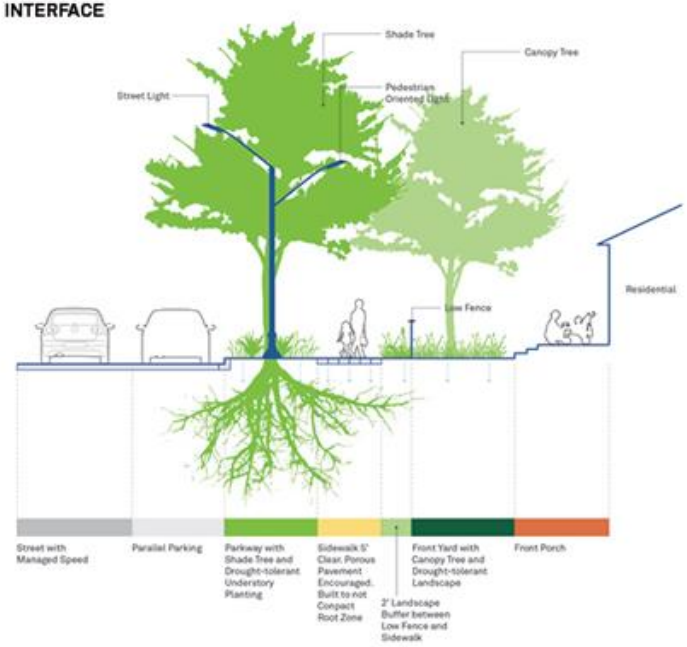
BEST CASE SCENARIO
TREE CANOPY COVERAGE THAT ALL CITY MAINTAINED STREETS CAN PROVIDE IS:
4.8%

STREET & PLACE INTERFACE

LANDSCAPE IN **RESIDENTIAL INTERFACE**



LANDSCAPE IN **COMMERCIAL INTERFACE**



https://www.asla.org/2020awards/105.html

SIERRA AVENUE

TREE CANOPY

TEMPERATURE

HUMAN COMFORT

EXISTING

TREE CANOPY

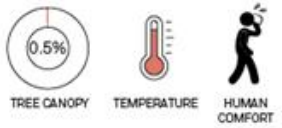
TEMPERATURE

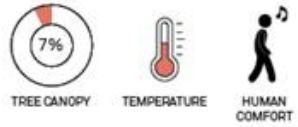
HUMAN COMFORT

PROPOSED

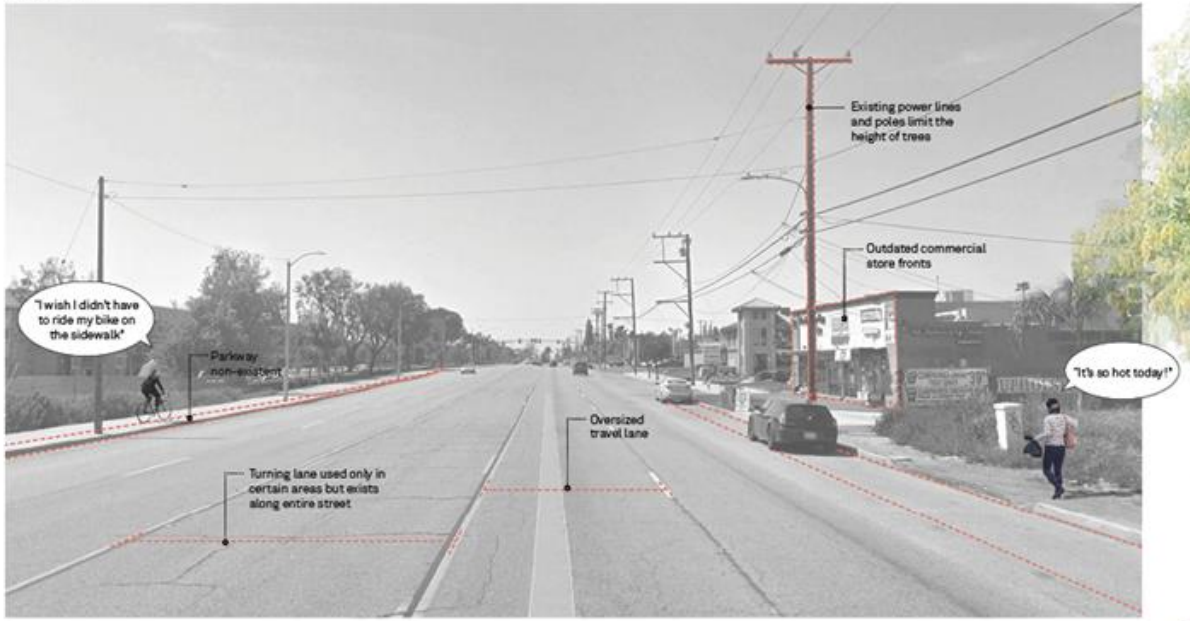
https://www.asla.org/2020awards/105.html

FOOTHILL BOULEVARD





EXISTING



PROPOSED

https://www.asla.org/2020awards/105.html

GREEN PLACES

BEST CASE SCENARIO:
TREE CANOPY COVERAGE ALL GREEN PLACES CAN PROVIDE IS: **12.6%**

WALKABLE MIXED-USE

SITE SCALE

TREE CANOPY COVERAGE
Existing 1%
Proposed 8%

LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF
Existing 3%
Proposed 28%

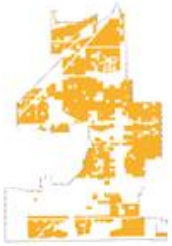
CITY SCALE

TOTAL: 2,039 ACRES
TREE CANOPY COVERAGE PERCENTAGE
0.5%
CO2 REDUCTION
0.92%

RESIDENTIAL

TREE CANOPY COVERAGE
Existing 5%
Proposed 17%

LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF
Existing 53%
Proposed 63%



TOTAL: 15,409 ACRES
TREE CANOPY COVERAGE PERCENTAGE
8.3%
CO2 REDUCTION
2.59%

PARKS & OPEN SPACE

TREE CANOPY COVERAGE
Existing 9%
Proposed 11%

LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF
Existing 58%
Proposed 65%

TOTAL: 2,564 ACRES
TREE CANOPY COVERAGE PERCENTAGE
0.9%
CO2 REDUCTION
15.06%

https://www.asla.org/2020awards/105.html

GREEN PLACES

COMMERCIAL

SITE SCALE

TREE CANOPY COVERAGE

Existing 0.5%

Proposed 7%

LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF

Existing 3%

Proposed 27%

CITY SCALE

TOTAL: 1,825 ACRES

TREE CANOPY COVERAGE PERCENTAGE

0.4%

CO2 REDUCTION

0.84%

INDUSTRIAL

TREE CANOPY COVERAGE

Existing 3%

Proposed 8%

LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF

Existing 7%

Proposed 31%

TOTAL: 8,505 ACRES

TREE CANOPY COVERAGE PERCENTAGE

2.1%

CO2 REDUCTION

1.80%

SCHOOLS & PUBLIC FACILITIES

TREE CANOPY COVERAGE

Existing 7%

Proposed 9%

LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF

Existing 48%

Proposed 55%

TOTAL: 1,248 ACRES

TREE CANOPY COVERAGE PERCENTAGE

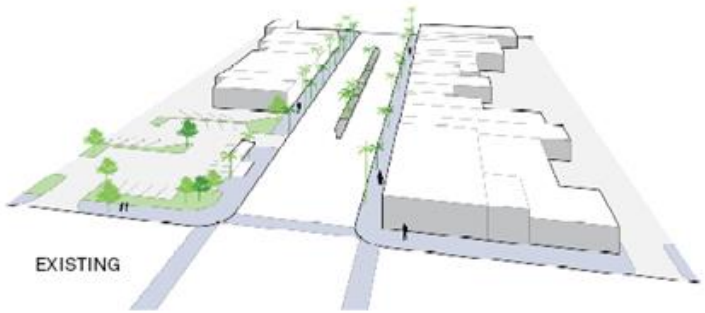
0.4%

CO2 REDUCTION

0.10%

https://www.asla.org/2020awards/105.html

WALKABLE MIXED-USE



LAND DISTRIBUTION

EXISTING

PROPOSED

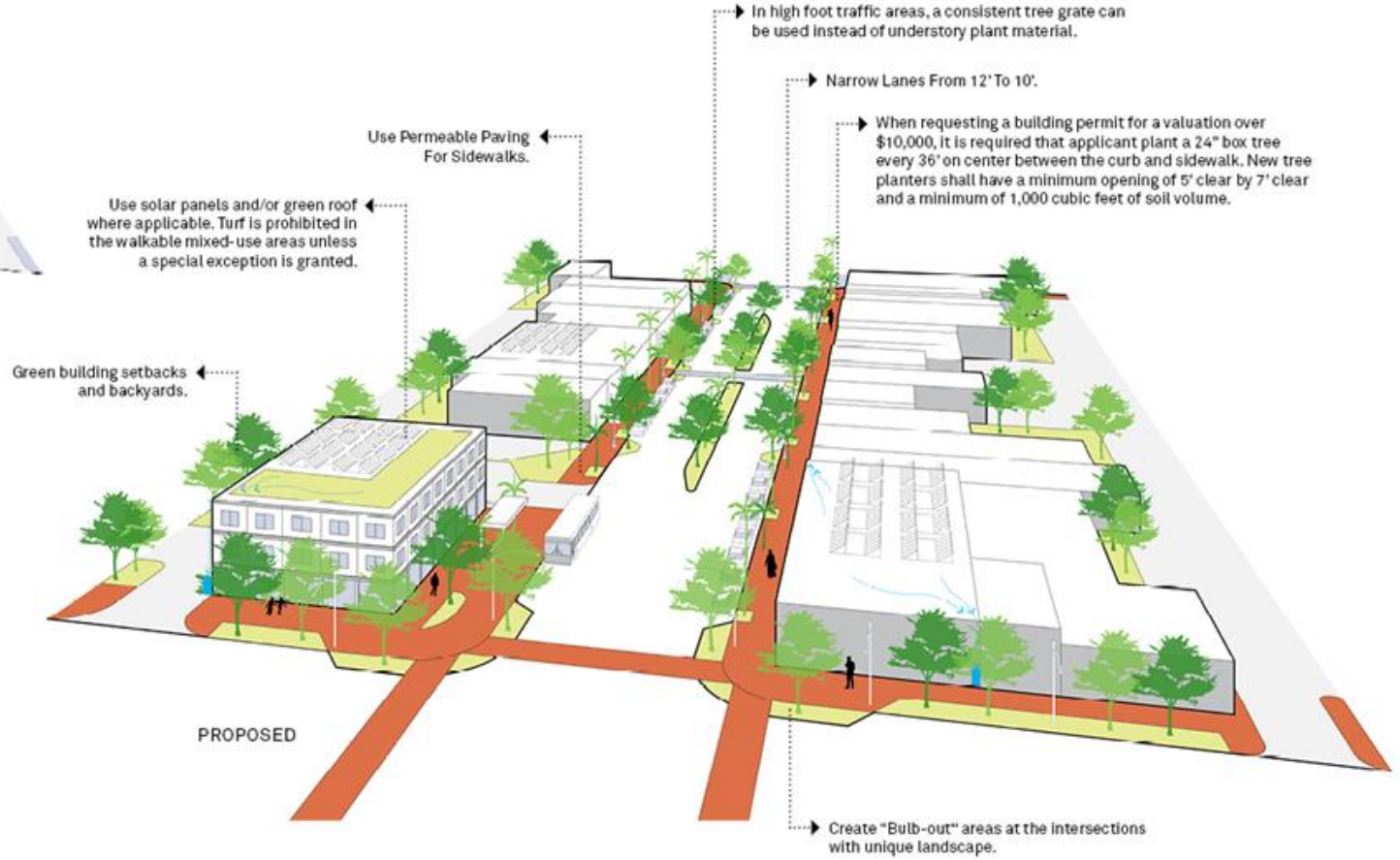
- Impermeable Surface Area
- Permeable Surface Area
- Landscape Area
- Hard Rooftop Surface Area
- Green Rooftop Surface Area

TREE CANOPY COVERAGE

- Existing 1%
- Proposed 8%

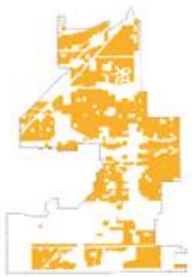
LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF

- Existing 3%
- Proposed 28%



https://www.asla.org/2020awards/105.html

RESIDENTIAL

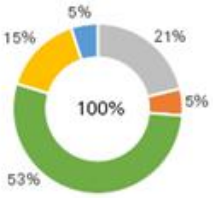


EXISTING

LAND DISTRIBUTION

EXISTING

PROPOSED



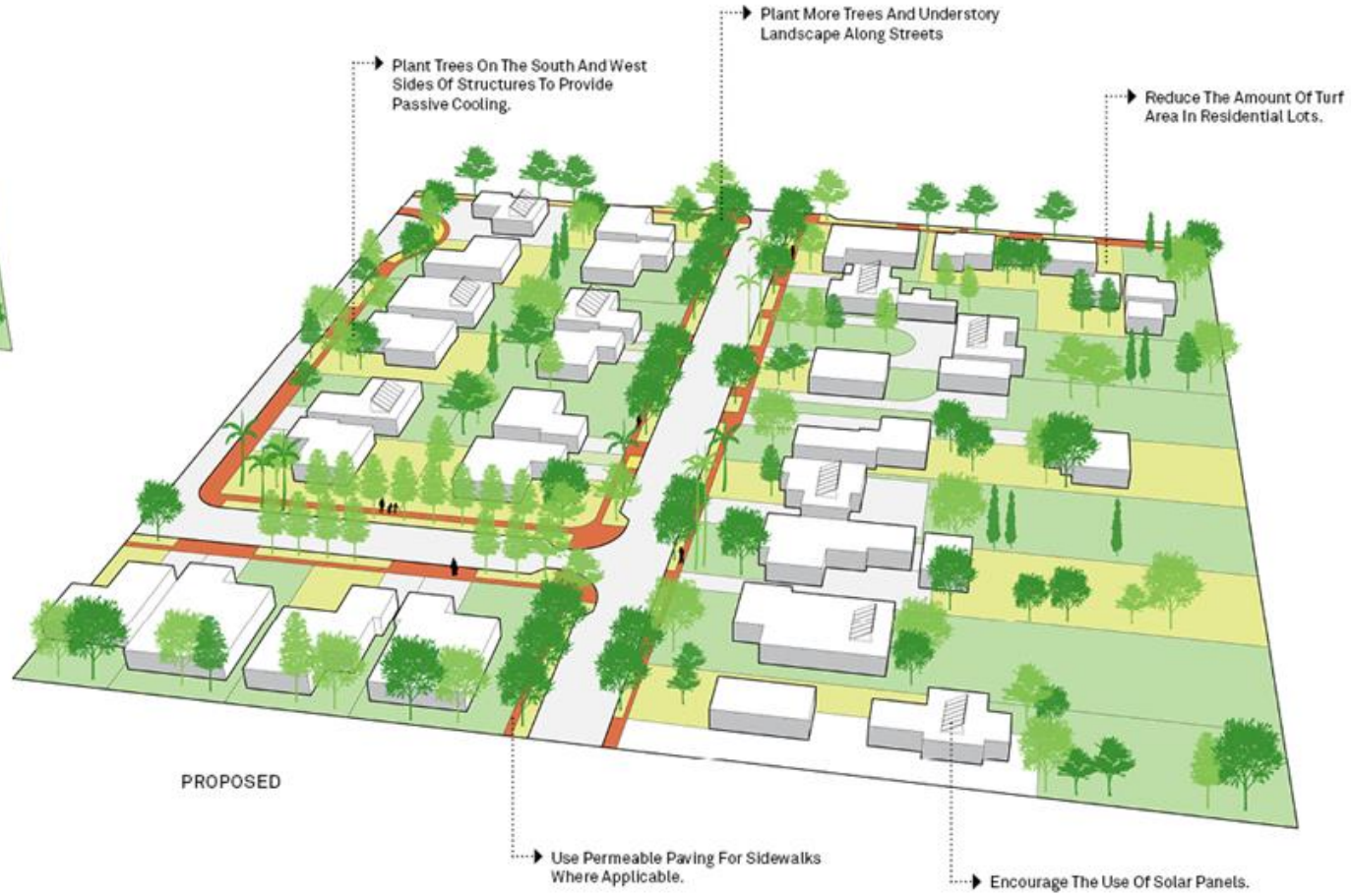
- Impermeable Surface Area
- Permeable Surface Area
- Landscape Area
- Hard Rooftop Surface Area
- Green Rooftop Surface Area

TREE CANOPY COVERAGE

- Existing 5%
- Proposed 17%

LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF

- Existing 53%
- Proposed 63%



PROPOSED

https://www.asla.org/2020awards/105.html

PARK & OPEN SPACE

EXISTING

LAND DISTRIBUTION

EXISTING

PROPOSED

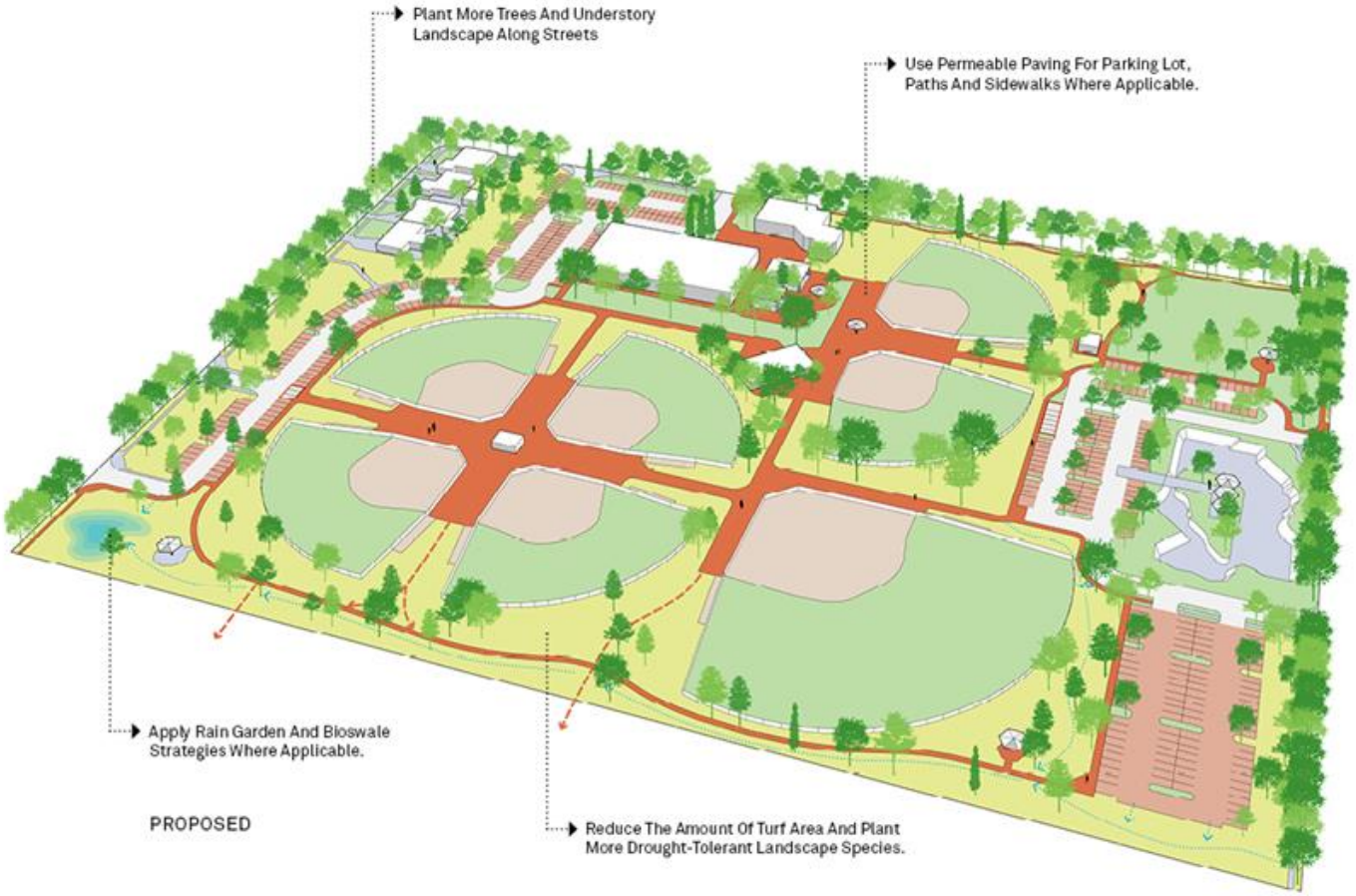
- Impermeable Surface Area
- Permeable Surface Area
- Landscape Area
- Hard Rooftop Surface Area
- Green Rooftop Surface Area

TREE CANOPY COVERAGE

- Existing 9%
- Proposed 11%

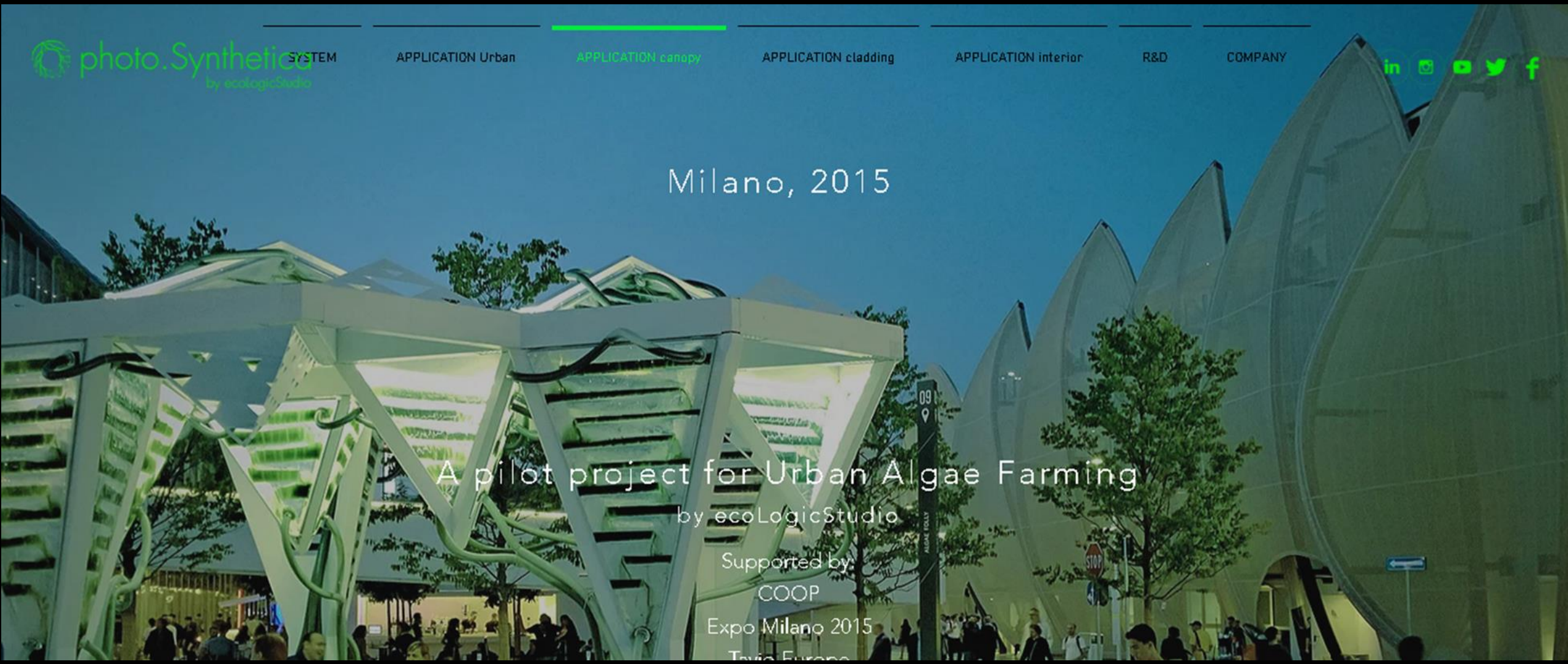
LANDSCAPE AREA + PERMEABLE SURFACE + GREEN ROOF

- Existing 58%
- Proposed 65%



PROPOSED

https://www.asla.org/2020awards/105.html



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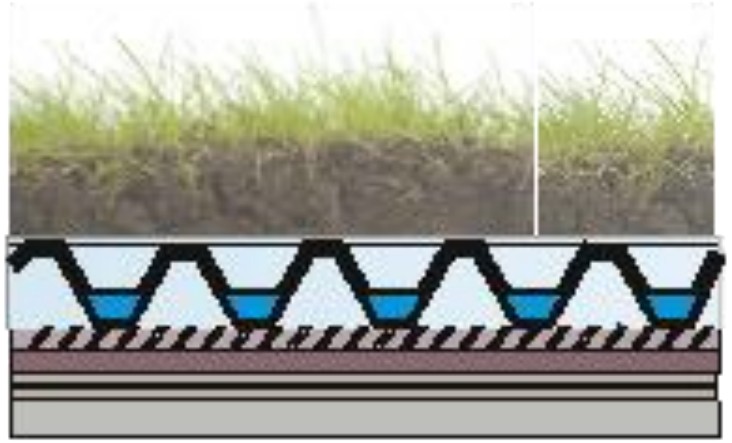
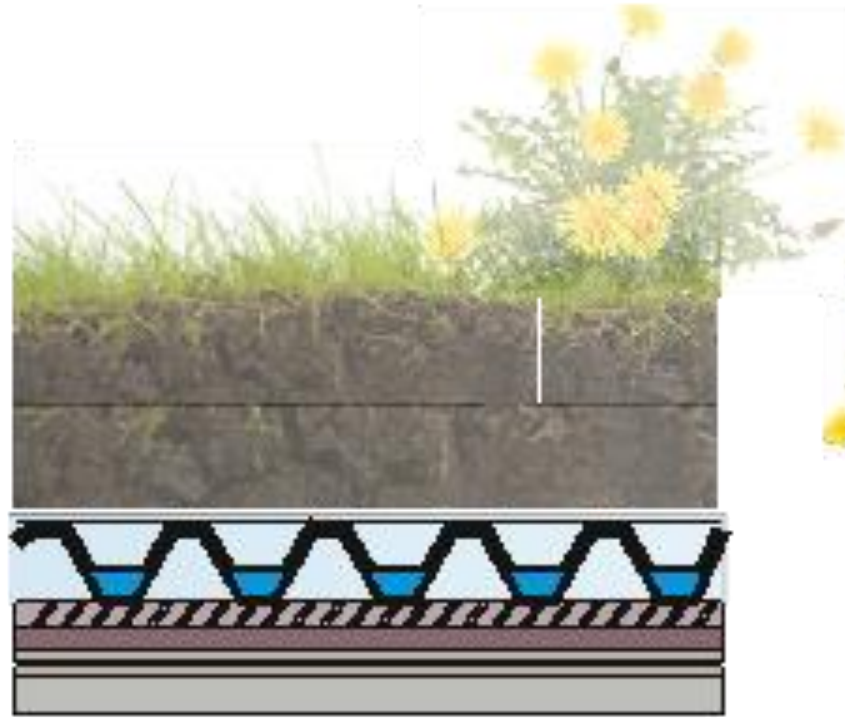
2010. 08. 18

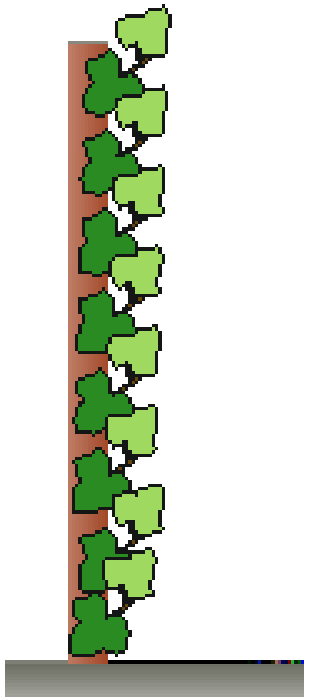

2010.08.18



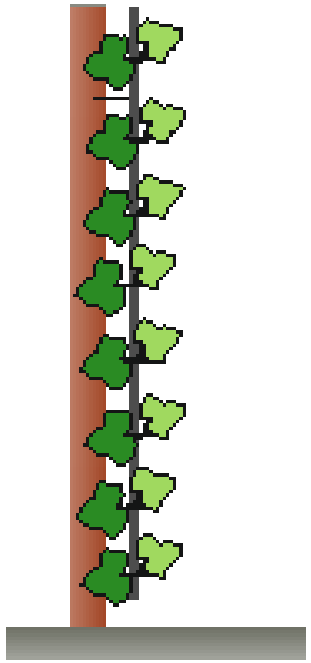



2010 08 03

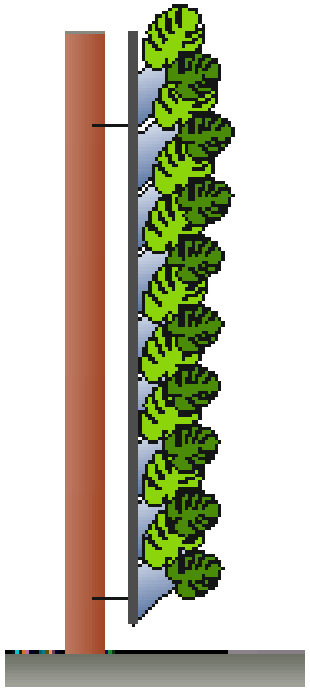

2010 08 03



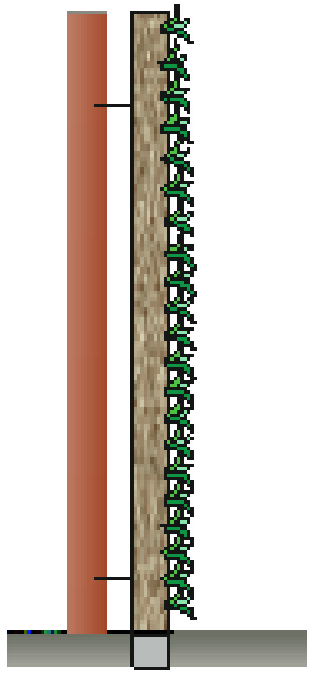
„Żyjąca ściana" z pnączy bez podpór.



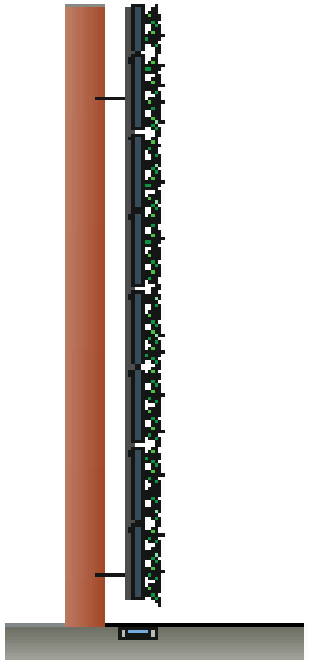
„Żyjąca ściana" z pnączy z podporami.



„Żyjąca ściana" - pojemnikowa.



„Wertykalny ogród" - gabionowy.



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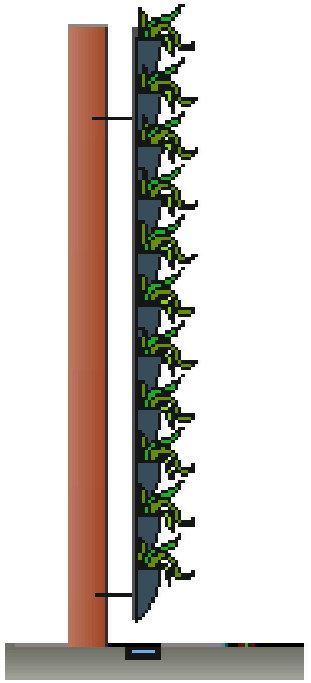

„Wertykalny ogród" - trójwarstwowy.


2010.08.02