

CLIMATE CHANGE IMPACTS SPRINGFIELD MA

And Why the LINEAR URBAN FOREST IS IMPORTANT

**Climate Change Risk Analysis Assessment
of
Future Natural Disaster Threats and Impact
on Springfield**

Impacts of Climate Change in Springfield Looking Ahead to 2050, 2070 and Beyond

Urban heat island effect



Springfield will see increased temperatures due to heat island effect



Transportation Revolution



Springfield will see more intense increased flooding and storms



Changes to Ecological Resilience



Decreased air quality
Springfield's air quality will decline due to increased emissions



Biodiversity Impacts

Springfield needs climate change solutions like the LUF to address these impacts

GET CLIMATE READY NEW YORK!

URBAN HEAT ISLAND EFFECT





FLOODS

HARVARD CLIMATE CHANGE SOLUTION GRANT 2021-2024

The Harvard Gazette

New ideas for global warming solutions win \$1M in funding

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Linear Urban Forest

Martha Schwartz, Professor in Practice of Landscape Architecture, Harvard Graduate School of Design, with co-investigator Edith Katz, Teaching Associate, Harvard Graduate School of Design

11

New ideas for global warming solutions win \$1M in funding



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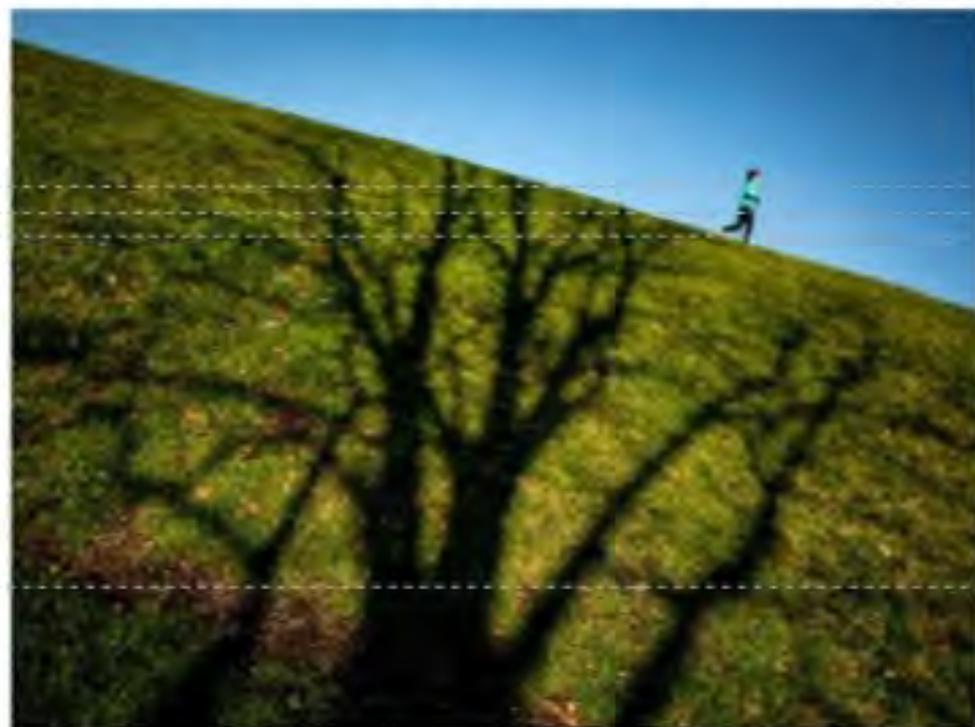


Fund awards proposals to ease climate challenges through research — Harvard Gazette

The Harvard Gazette

CAMPUS

New ideas for global warming solutions win \$1M in funding



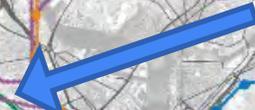
Climate Change Solutions Fund awards recognize nine projects around the world

INTERSTATE 95
DEVELOPMENT
BOUNDARY

NO BUILDING BEYOND
I-95 RING ROAD 128



EXTENDED SUBWAY AND
TRANSPORT PLAN
AS PROPOSED



NO "PERSONAL CAR ZONE"



- V.O.B. Vehicle Ownership
- Designated Traffic Interchange
- Interstate 95
- Study Area
- MBTA Green Line (2024 Plan)
- MBTA Red Line (2024 Plan)
- MBTA Blue Line

from Roll

from Roll





The Linear Urban Forest Springfield, MA

an update – February 2024

LINEAR URBAN FOREST

Meet the Team:



Martha Schwartz
Principal Investigator
Harvard Graduate School of
Design



Edith Katz
Research Assoc. | Grant Director
Harvard Graduate School of
Design



Ali Al Sammarraie
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Harvard School of Public Health



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Afforestation Expert
Director of Afforest



Sunny Verma
Afforestation Expert
Associate at Afforest



Varsha Gurjar
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City Benefits Analyst
Associate at SSC



Erin Gianferrara
Socioeconomic Benefits Expert
Director at Pollination



Abhishek Desai
Research Assistant - 3D Modeling
Harvard Graduate School of
Design





An aerial photograph of a city grid. A major highway runs diagonally from the top right towards the bottom center. The city is densely packed with buildings and streets. In the top left, there is a large green area, possibly a park or sports field. The overall scene is a mix of urban development and green space.

RE-SHAPING CITIES:

**WHERE DO WE FIND
SPACE IN CITIES TO
PLANT FORESTS?**

**FUTURE TRANSPORT IS
FUNDAMENTAL TO
CHANGING OUR CITIES**

49% OF A CITY ARE ITS STREETS

**STREETS ARE THE
LARGEST SINGLE
PUBLIC SPACE
ASSET IN CITIES**

PARKED CARS COVER 29% OF A CITY

CLIMATE CHANGE & URBAN LANDSCAPE

THE BEGINNING OF THE END OF SINGLE OWNER CARS...

...OPENING UP VAST TRACTS OF LAND

Only 20% of Americans will own a car in 2035. Fewer cars were on the road, cities could find other uses for street lanes and parking garages.



01-30-20 | WORLD CHANGING IDEAS

Here are 11 more cities that have joined the car-free revolution

From Amsterdam to Tempe, Arizona, more and more cities are finding that eliminating cars from their streets makes people happier and healthier.





1. HELSINKI



[Photo: Tim Goedhart/Unsplash]

2. AMSTERDAM



[Photo: Erwan Hesry/Unsplash]

3. BARCELONA



[Photo: Kelvin Yup/Unsplash]

4. BIRMINGHAM U.K.



[Photo: Brent Timmermans/Unsplash]

5. BRUSSELS



[Photo: Alex Vasey/Unsplash]

6. GHENT BELGIUM

AUTOMATED VEHICLES + CLIMATE READY

CITIES



Automated Car Advancements

SEQUESTROPOLIS: The City as a Machine for Combating Global Warming
Harvard Graduate School of Design | Option Studio 1407 | 2016-2017



Waymo, Uber set aside past rift
team up on self-driving taxis
Phoenix

PHOENIX

in Fairfax, Virginia, Miami, Los Angeles and Mountain View, California, where all-electric sidewalk robots and autonomous cars are delivering food to the co



Fully Driverless Taxis Are Now Roaming
This City in China

Visit >

CHINA



Riding Google's NEW Waymo
Driverless taxi in LA!

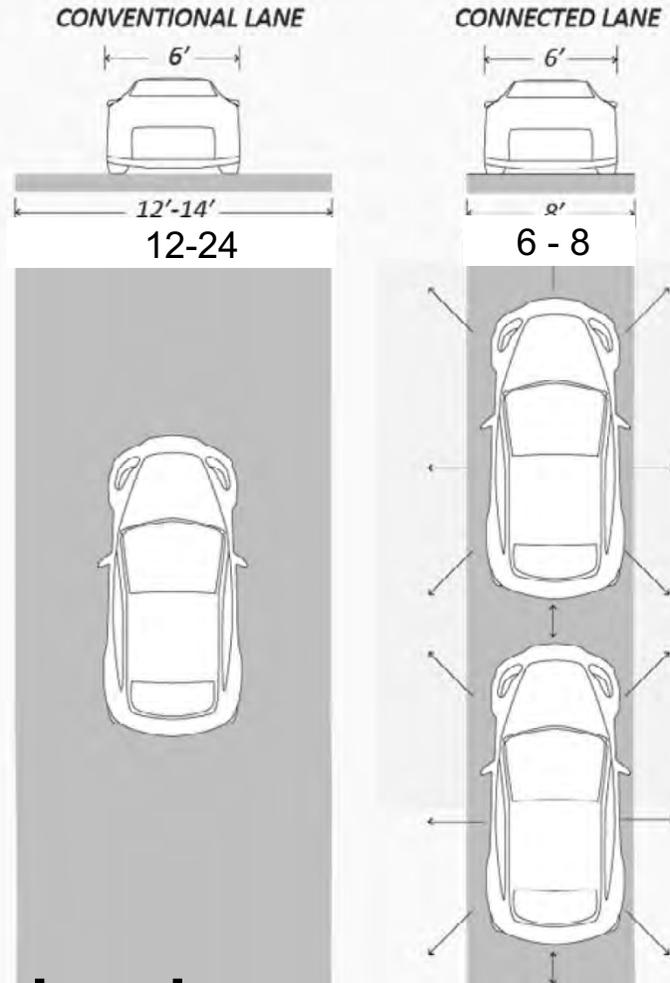
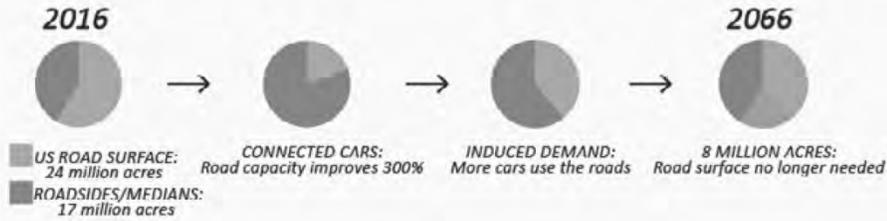
Watch >

Uploaded: Oct 8, 2023 · 20.4K Views · 339 Likes

We got a preview of Waymo's driverless taxi, which will be open to
some members of the public in LA starting October 11th., Read

LOS ANGELES

CONNECTED VEHICLES DEMAND LESS ROAD SURFACE



SHORT-RANGE SENSORS WILL BE REQUIRED ON NEW VEHICLES IN 2020

VEHICLE-TO-VEHICLE COMMUNICATION (V2V)

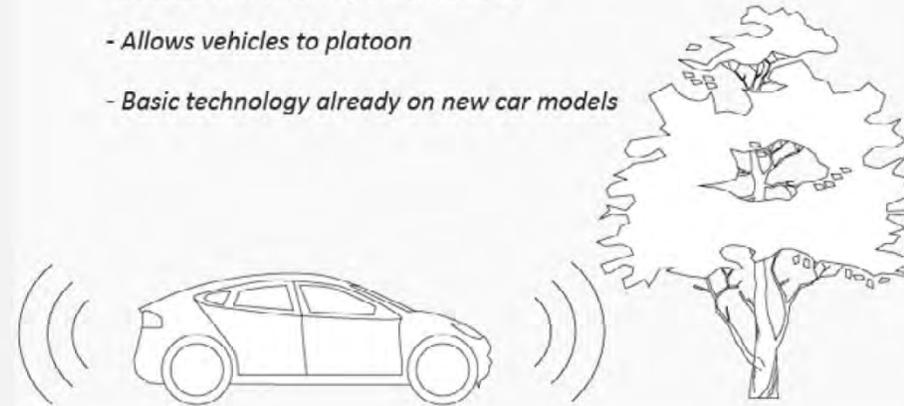


INTERNET OF THINGS (IoT) / VEHICLE-TO-EVERYTHING COMMUNICATION (V2X)



SENSOR TECHNOLOGY MAKES THE CLEAR ZONE UNNECESSARY

- Detects movement of other vehicles
- Allows vehicles to platoon
- Basic technology already on new car models



Ellen Oettinger White 2016

Connected and autonomous vehicle technology (Ellen Oettinger White)

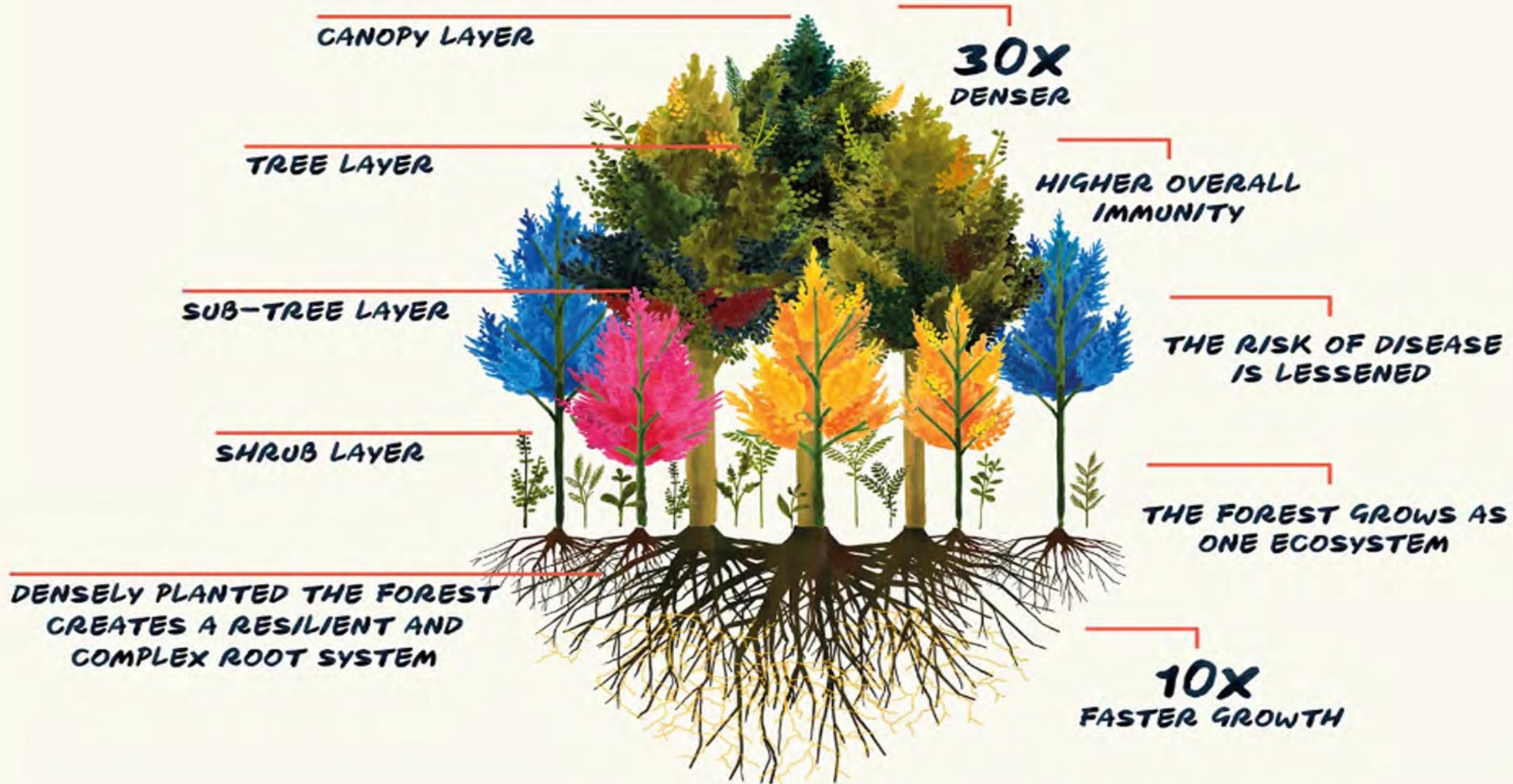
CREATING THE LINEAR URBAN FOREST



THE MIYAWAKI METHOD



THE MIYAWAKI FOREST



STEP#1. Identifying Native Species



Collecting Seeds/Acorns, etc.

STEP#2. Creating the Linear Urban Forest



October, 2017 (Belgium)



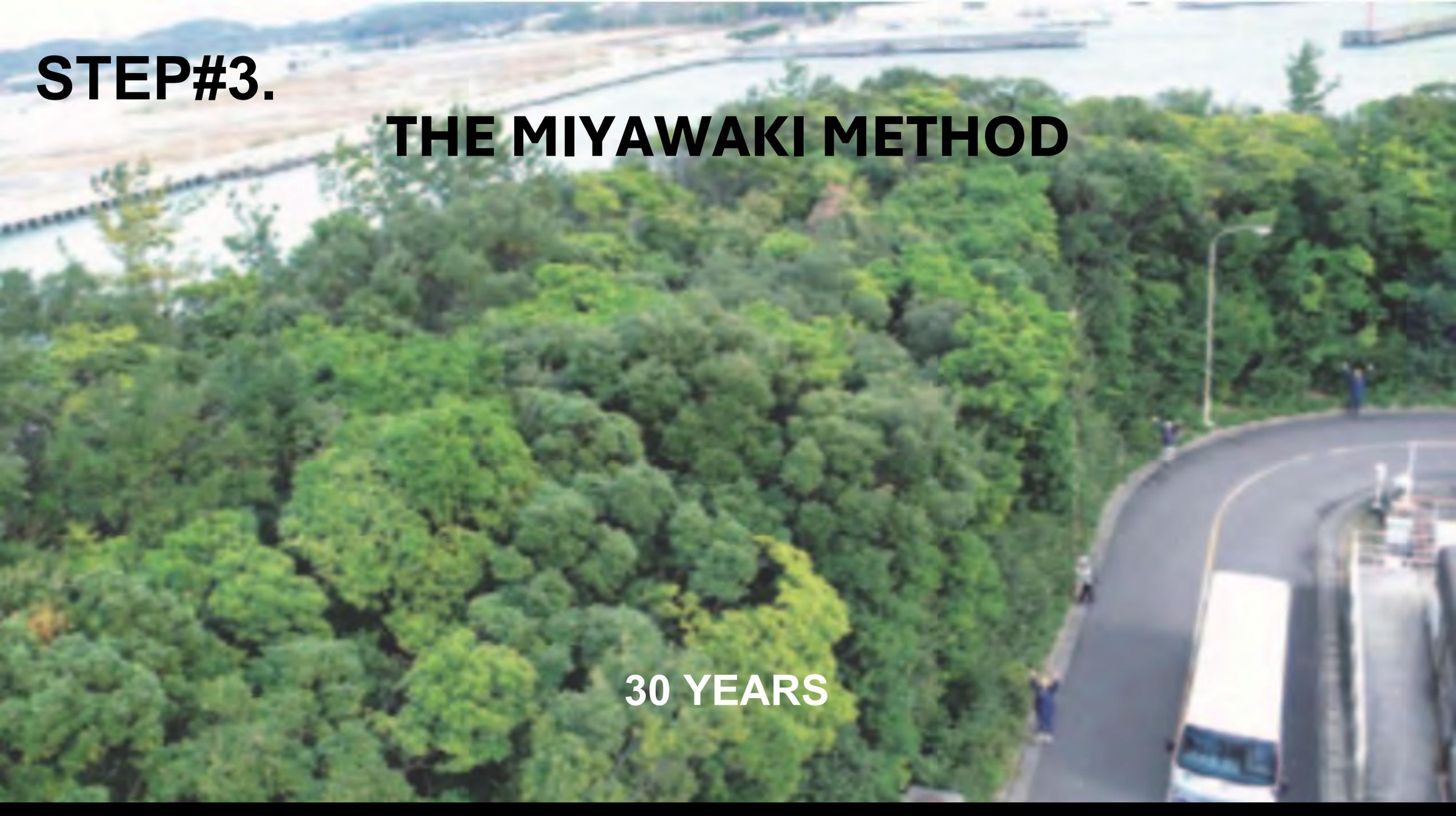
April, 2020 (Belgium)

3 YEARS

STEP#3.

THE MIYAWAKI METHOD

30 YEARS





**Multi-modal
Lane**

Bioswale

Road

Bot Lane

**Linear Urban
Forest**

**Multi-modal
Lane**



Google Earth

Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

DIFFERENT STREET TYPOLOGIES



Springfield's Linear Urban Forest - 2080





Springfield's Linear Urban Forest



Springfield - 2024



Springfield with Linear Urban Forest - 2080

Springfield's Linear Urban Forest





Bot Arriving in 2 Minutes

BENEFITS OF THE LINEAR URBAN FOREST

Increased quality of life

Reduced greenhouse gas emissions

Human respiratory and mental health

Decreased Energy Bills

Biodiversity and Economic uplift

Environmental Justice

Cleaner storm water runoff and Flood reduction

Contact with nature and cooling temperature

LIVEABLE CITY of the FUTURE.



**Our Calculations show that for EVERY \$1 invested
on the LUF**

SPRINGFIELD WILL BRING IN \$3 IN BENEFITS





East
Mass Pike
Boston



Liberty at Armory Street

2030