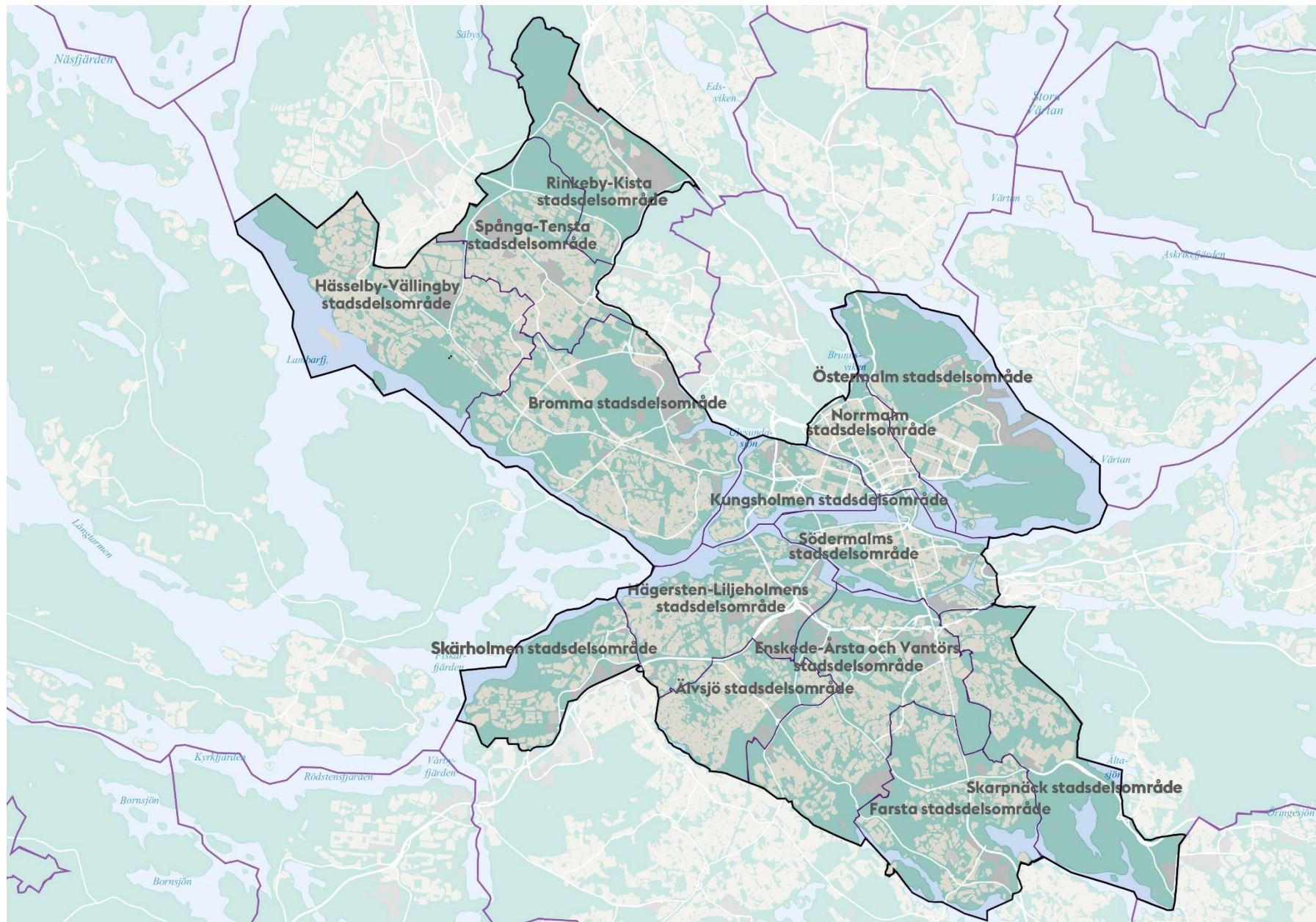


Revitalisering af træer i den tætte by: Metoder og eksempler fra Stockholm



Stockholm

- **Transport Department (street trees ca 35 000)**
- **11 City District Councils (parks, nature)**
- **Development Department (new trees)**



Tree specialists



- Planning
- Tenders
- Construction
- Planting/
replanting
- After care
- Pruning



In the beginning

Urban trees: **Vision**



A healthy and well diversified street tree population regarding age and species selection

Urban substrates substitute compacted soils

**Compacted
soils**

**Poor
conditions
for trees and
greenery**

**Lack of
loadbearing
capacity**



Esplanade System

- Lime trees
- Not paved but open surfaces
- No utilities



Odengatan

Tilia

August



A close-up photograph of a branch with green leaves and small, dark blue-purple berries against a clear blue sky. The text "How it started" is overlaid in white, bold font in the center-left area of the image.

How it started

Kungsbroplan

Tilia

2002 till 2013





Norrtullsgatan

Stockholm structural soil

STOCKHOLM STRUCTURAL SOIL

A construction method that optimises gaseous exchange and use of stormwater runoff to create good conditions for trees in paved areas and provide excellent load bearing capacity for streets while minimising risks of damage to paving and underground pipes



Why?

- Space for roots
- Air
- Water
- Loadbearing capacity

Visions



Planting pits that are sustainable

As little environmental impact as possible regarding materials and performance (local materials)

A simple construction method

Low maintenance costs

A result where trees and planting pits are a continuous part of Stockholm's environmental solutions

Macadam with biochar

BIOCHAR-ENRICHED STOCKHOLM STRUCTURAL SOIL

Providing trees with durable planting beds built with locally sourced materials is a key goal for the City of Stockholm. Enriching the Stockholm structural soil with biochar enhances the performance of the system as a carbon sink. It also helps provide better stormwater management (beyond volume reduction) by reducing leaching of pollutants to the water table.



- Different fractions of macadam
- Biochar + compost
- Local materials
- Renewable materials

Macadam 5/8 mm and Biochar

- Different sized stones 2/6, 4/8 or 2/8 mm
- Fine fraction of Biochar, fertilised + Compost
- Used for planting trees, shrubs and perennials

A close-up photograph of a branch with vibrant green, oval-shaped leaves and clusters of small, dark, round berries. The background is a clear, bright blue sky. The text is overlaid in the center-left of the image.

Retrofitting (växtbäddsrenovering)

Retrofitting trees in hard surfaced areas



Odengatan 2010

- Removing and exchanging substrate
- Creating new space for roots
- Saving trees that have a future, exchanging others
- Paving on top

Södra Agneg Pterocarya

- Vacuum excavation/Air spade
- Exchanging substrates
- protection



Start from the tree





Root system





Pressure treated wooden box







Stockholms
stad



Cover the root system

Fine materials



**Valhallavägen
Tilia**

parkinglots



Water



Keep the moisture



Trench

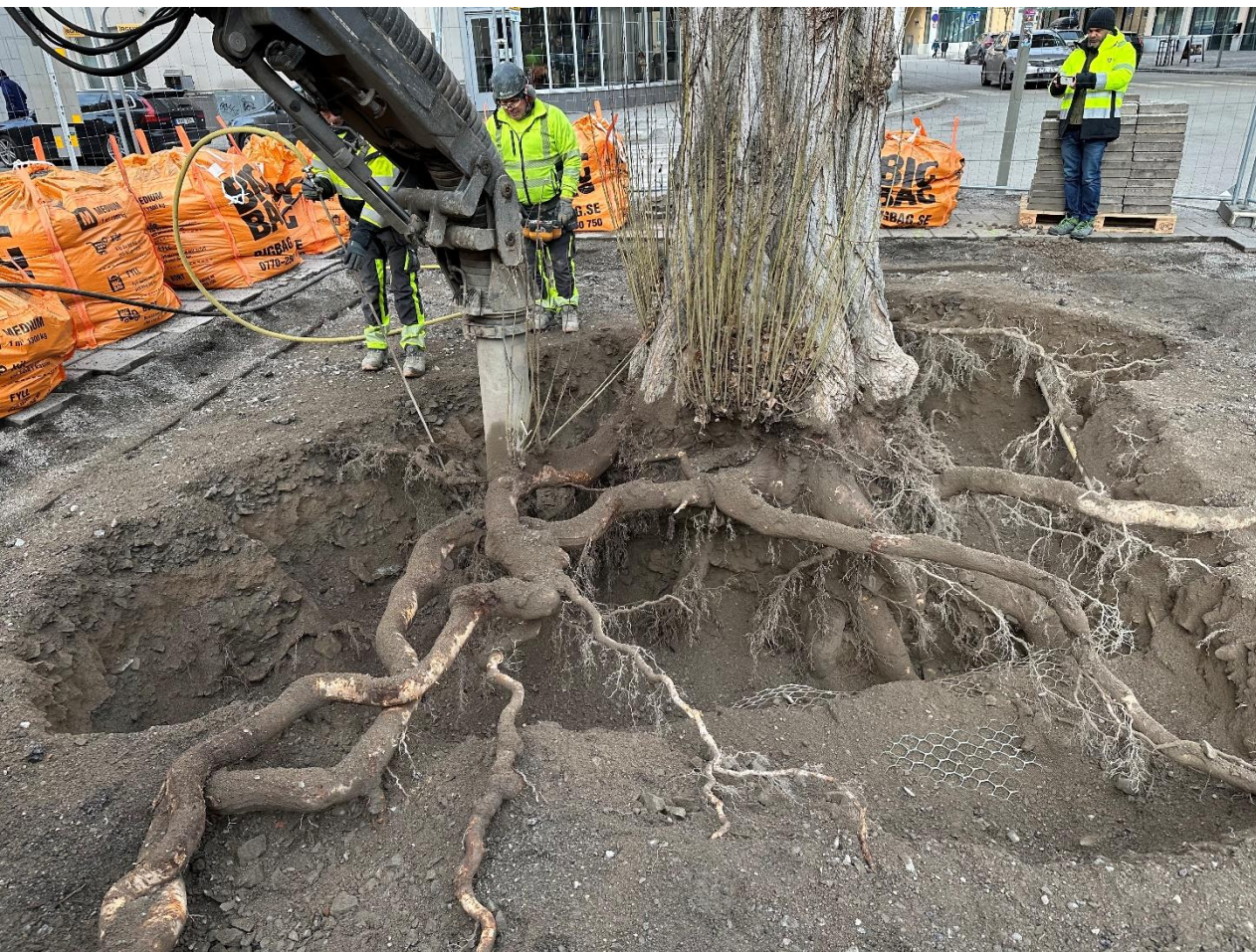


Trench



Paving





Monsters



Tunneling *Pinus nigra*





**Elms,
Kungs-
trädgården**

**Renovated
2018 with
biochar and
macadam**



Air spade

Voids

**substrate- +
biochar**

Suburbs



Results

A close-up photograph of a branch with green leaves and small, dark, round berries. The word "Results" is overlaid in white text on the left side of the image. The background is a clear blue sky.

Retrofitted and new trees



Odengatan 2012

- Picture taken second season after planting
- Instant effect

Valhallav

Parking





Drottninggatan/Barnhusgatan: Magnolia kobus, planted 1997

**Drottningg/
Barnhusg:**

Magnolia

Rootsystem



gravel



**Södra
Agnegatan**

Pterocarya

gravel



Bobergsg/Jaktg

Acer platanoides

1 m higher





Lessons learned

Tilia



Acer



Vacuum excavation, problems, Narvavägen



Water and After care of renovated trees





**Deicing
salt
22%**

**Decline of
mature
trees,
inner city**



Art: Ginkgo Biloba

Adress: Hornsgatan 129-131

Växtplats: Hårdgjord yta



| | | |
|--------------|-------|-------|
| Natrium Na | mg/kg | 15396 |
| Eisen Fe | mg/kg | 272 |
| Chlorid Cl | mg/kg | 21079 |
| Aluminium Al | mg/kg | 129 |

Salt damage. Cycelpaths, pavements.



TACK!

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