



ACO On Site | Sponge Cities for Trees

Daniel Zimmermann & Christopher Peiritsch

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AGENDA

Climatic problems in Urban Areas

The Cooling Effect of “Green Street Elements”

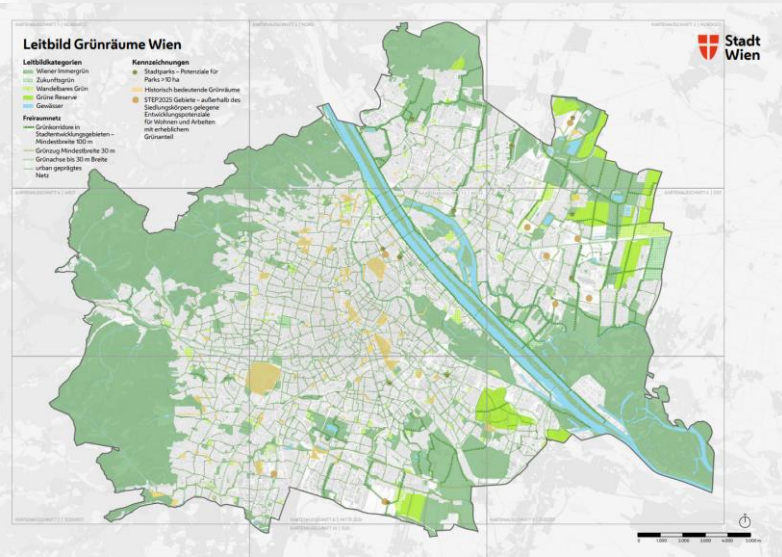
City Trees Today: The Space Problem

Solution: Sponge City Tree Concept

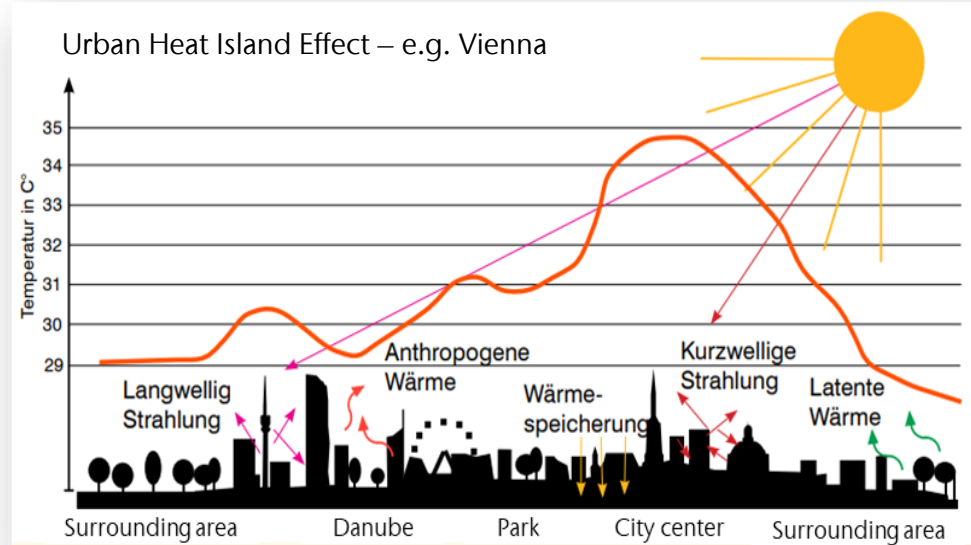
- New built street project – Seestadt Aspern
- Existing street project – Graz



Climatic Problems in Urban Areas – e.g. Vienna



Green areas in Vienna & its heavily built-up city center



Up to +6°C temperature difference between the surrounding area & the Vienna city center

Climatic Problems in Urban Areas



In 2080, Vienna could be as hot as Dakar is today.



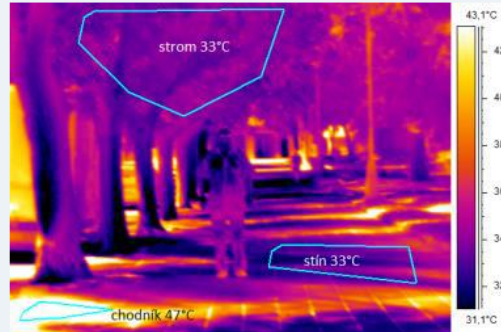
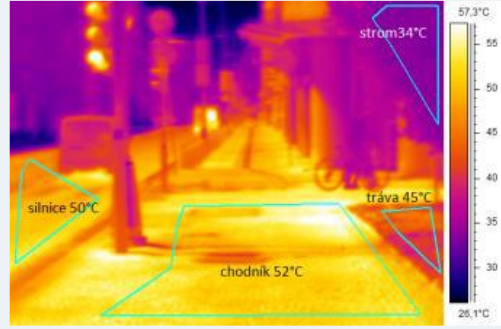
Heavy rain and heat waves push cities to their limits.



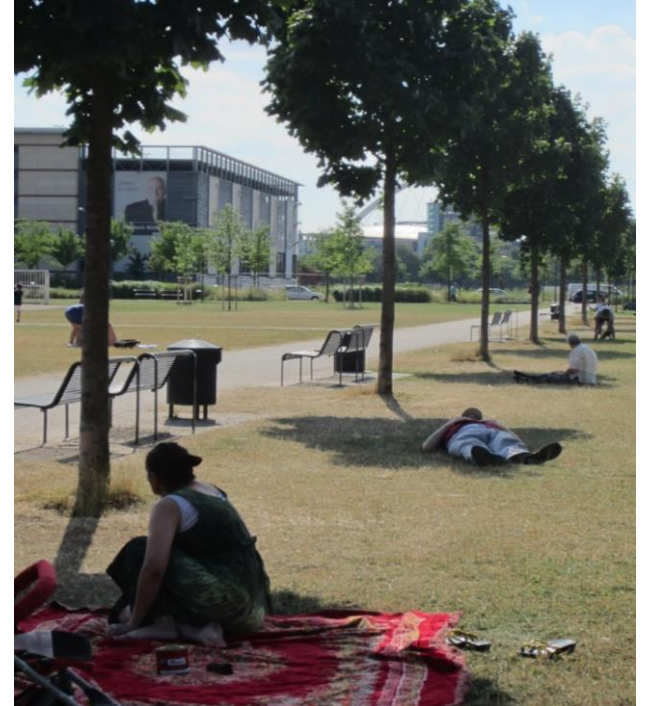
Fotos: Adobe Stock

Street space is unfairly distributed.

Climatic Problems in Urban Areas



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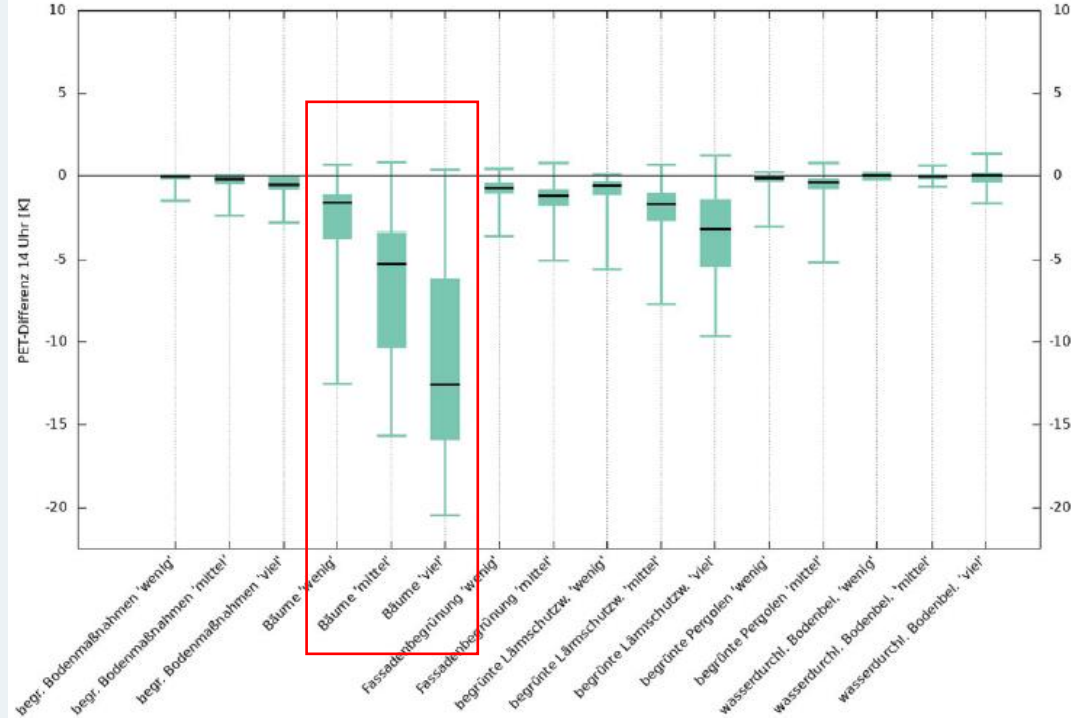
Strategic actions for climate-sensitive urban planning



- Façade greening
- Green roofs
- New planting of urban trees
- Fresh air corridors
- Lighter colored buildings & surface materials
- ...

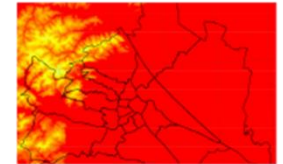
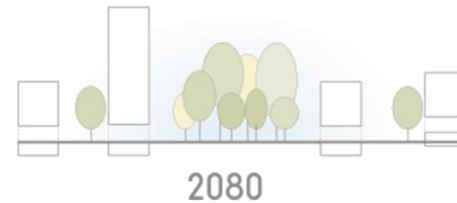
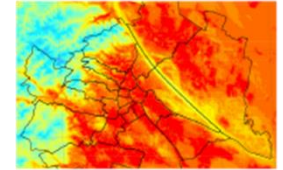
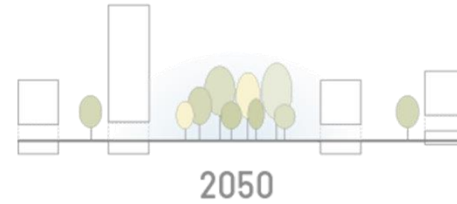
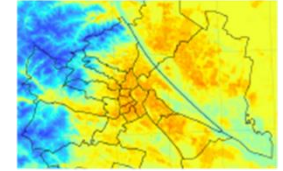
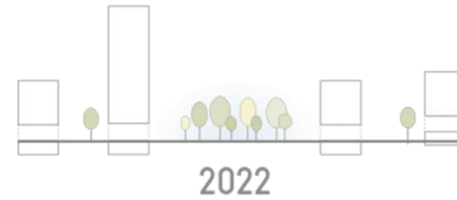
The Cooling Effect of “Green Street Elements”

Recent studies show that urban trees reduces the “felt temperature” (PET).

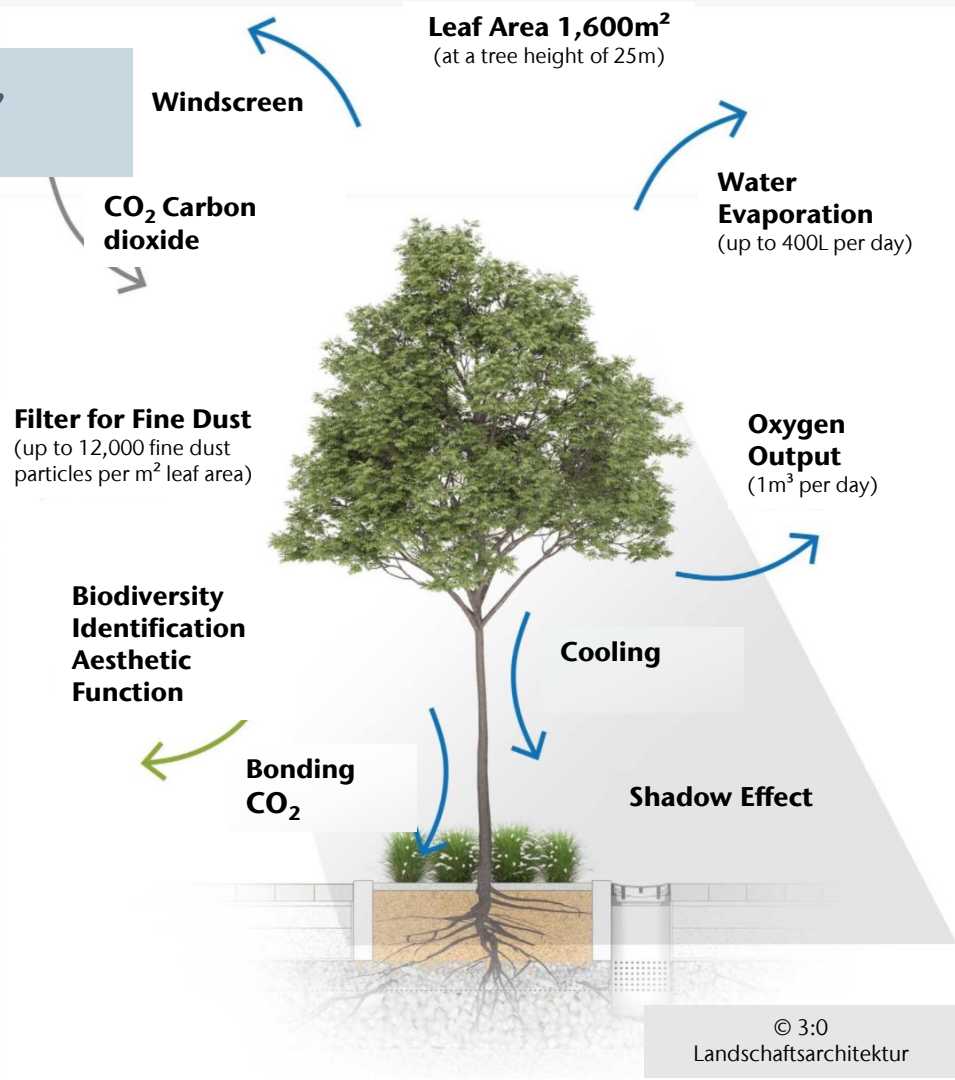


The Cooling Effect of “Green Street Elements”

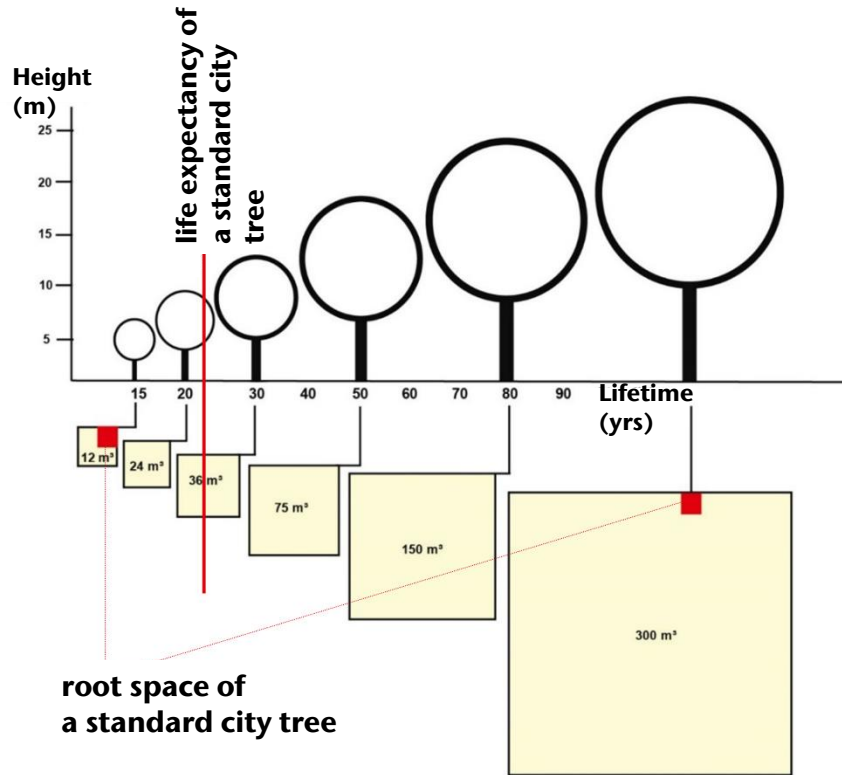
Trees that are planted today will help keeping public space enjoyable in 2080.



More Positive Effects of “Green Street Elements”



City Trees Today: The Space Problem





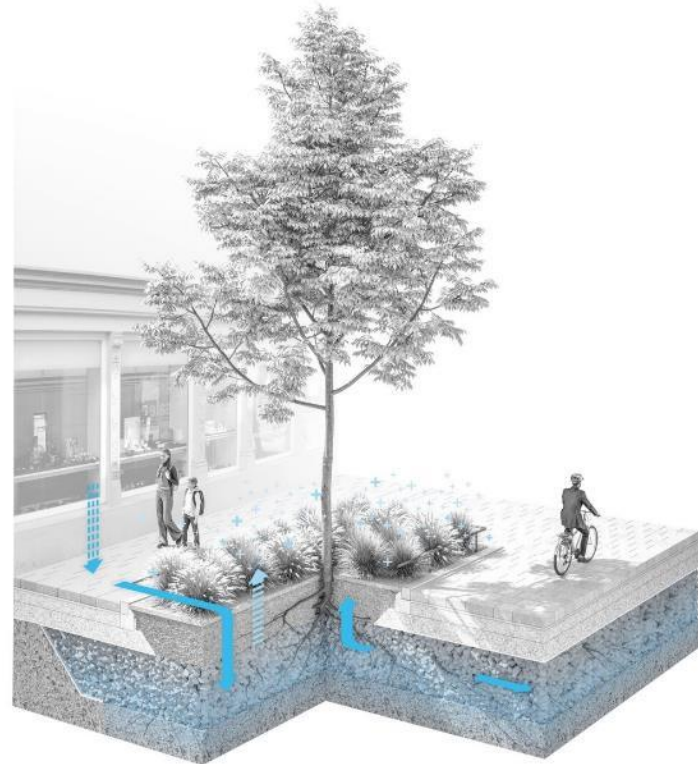
VIDEO Quartier "Am Seebogen"

Sponge City Concept

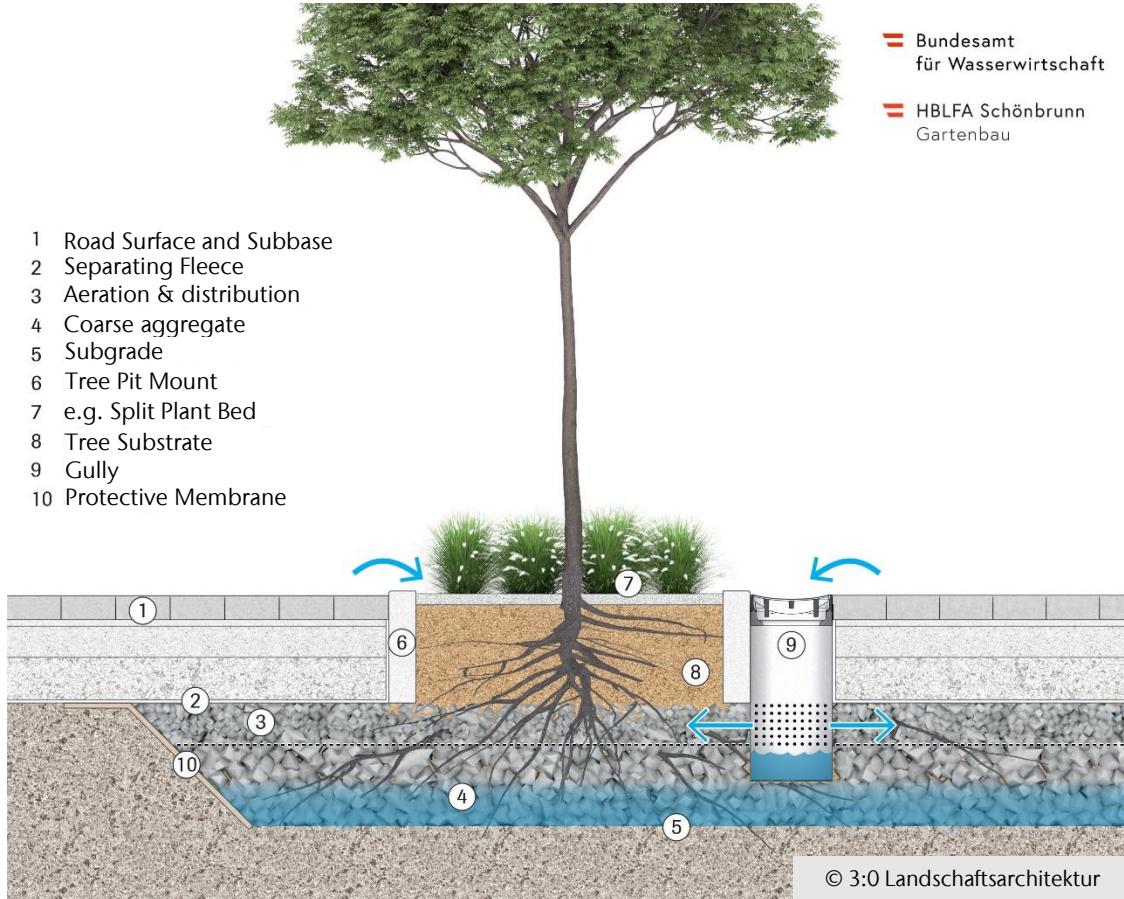
Solution: Sponge City Tree Concept

Giving trees what they need:
space, air, water, soil

- ✓ Ensures survival of urban trees
 - ✓ Ensures the development of large-crowned trees in paved areas
- ... while at the same time providing sufficient space for urban life on the above ground.



Solution: Sponge City Tree Concept



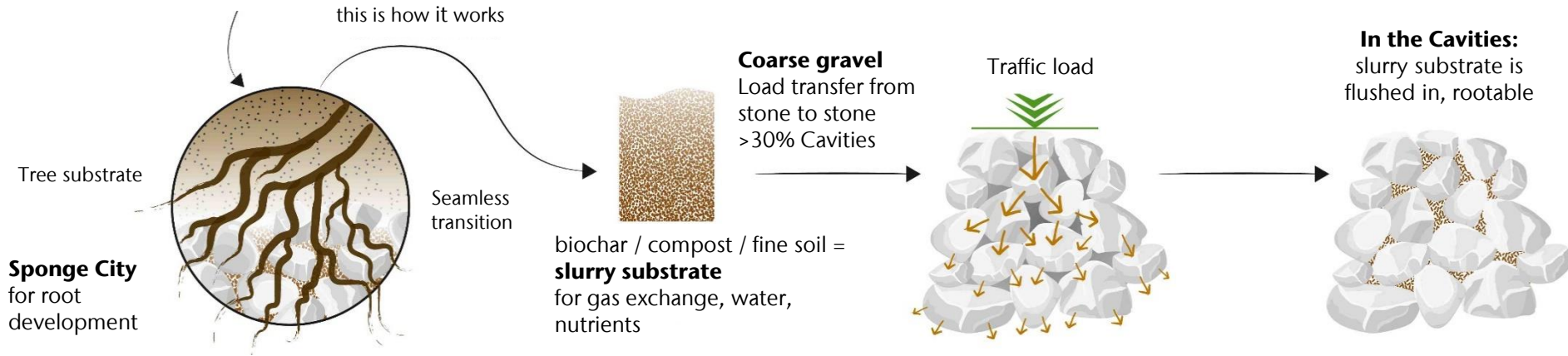
Structure:

- Road surface or green surface
- Distribution layer for water and air
- "Sponge city substrate" made of skeletal grain + fine substrate in the coarse voids.

Properties:

- Rootable to the outside
- Open at the bottom - water retention takes place in soil pores

Sponge City Trees: Structure & Function



© Karl Grimm, Erwin Murer, Stefan Schmidt

- Root space with water, soil, air and nutrients
- Simple construction, "low-tech" approach

Subsoil (subbase under coarse gravel)



60cm Coarse Gravel



Compacting



Slurry Substrate



High Pressure Sludge



Aeration/distribution layer



Final Surface & Sponge City Trees



GRAZ - Sponge City in Existing Streets



Challenges:

- Existing infrastructure & trees
- Acceptance of trees as green infrastructure by the city
- Fear of water below the paved surface

Solution:

- Kit of standard ACO Combipoint elements
- combined with newly developed parts – adaptable to any situation

Sponge City for Existing Trees



© Anna Zeiser



VIDEO MUFUWU Graz

Sponge city concept

