Perspectives from the municipalities on the water, waste water and storm water and link to landscape drainage

Seminar 12 November 2013

**Swedish Water House** 

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### Municipal water & sewer systems – 4,3 rounds around the equator



Water & sewer pipes on private properties not included



# Different solutions during different time periods – consequences when flooding!



### **Recommended pipe construction**

#### **Svenskt Vatten P90**



**NO** drainage water from basements to the sanitary sewer

Secure elevation houses, foundation drains and streets Use open storm water solutions as much as possible!



### Who ownes the stormwater issue?





#### Survey of water-ways on the surface – upstreams, through and downstreams a municipality



### Flooding, in urban built-up areas





#### Keep buildings away from low lying areas! Blue: Give space for water runoff!





### Give space for slow stormwater runoff Example of streets with infiltration facilities







## Retention basins and reduction of storm water pollutants







Demands in the city plan : max flow out: 80 l/s at a rain with 100 year return period, (compare with 6 000 l/s without retention)



### Open storm water solutions -needs space but can also be used for recreation





## Flow capacity in swales are much greater compared to pipes





### Secure elevation of houses and streets - don't forget the accessibility!





## The Greatest Challenges are improvements within existing buildig areas!



Better flow capacity and retention facilities!



### You can re-construct the streets!

Less impermeabel areas, infiltration zones and a better life for the trees!





### Downspot disconnection programs reduces storm water volume and fast runoff !



Tat vatten avledare.

skålade ränndals-

plattor

Sandinblandad

Terrassyta som skall luta ut från byggnad

Infiltrationsgrop med grovt grus

matjord



Encod 7 Collision di secolo di stato di

lusgrunds

dranaring

Kapillärbrytande och dränerande lager

### Get inspiration from Portland, Or (google: Portland + Rain gardens)





#### **Tom Liptan, Portland**



### Involve the private property owners - make them part of the solution!

