



# Green Infrastructure 101

Austin Troy

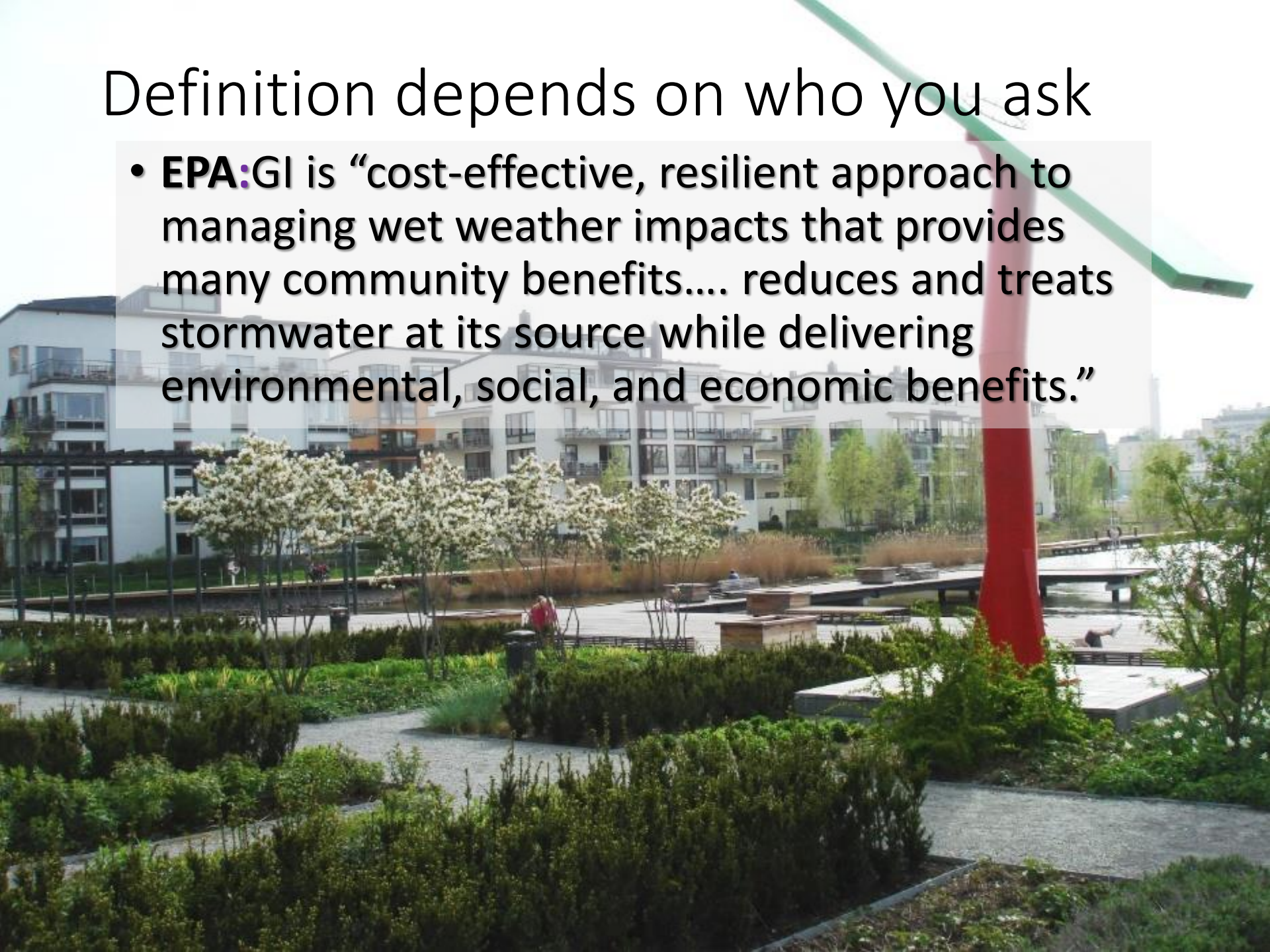
CU Denver Department of Urban and Regional  
Planning

Rocky Mountain Land Use Institute Conference 2019



# Definition depends on who you ask

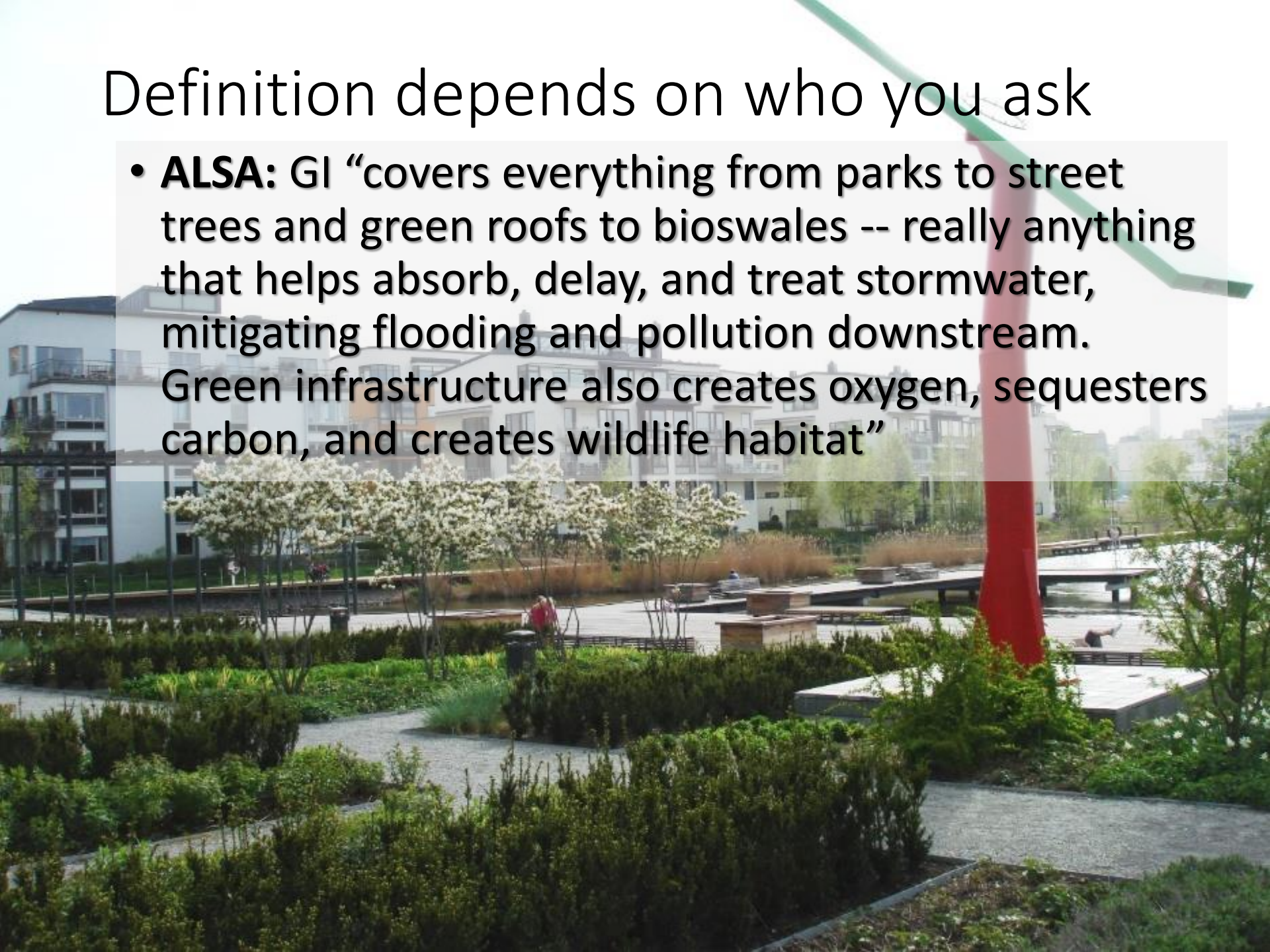
- **EPA:** GI is “cost-effective, resilient approach to managing wet weather impacts that provides many community benefits.... reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.”





# Definition depends on who you ask

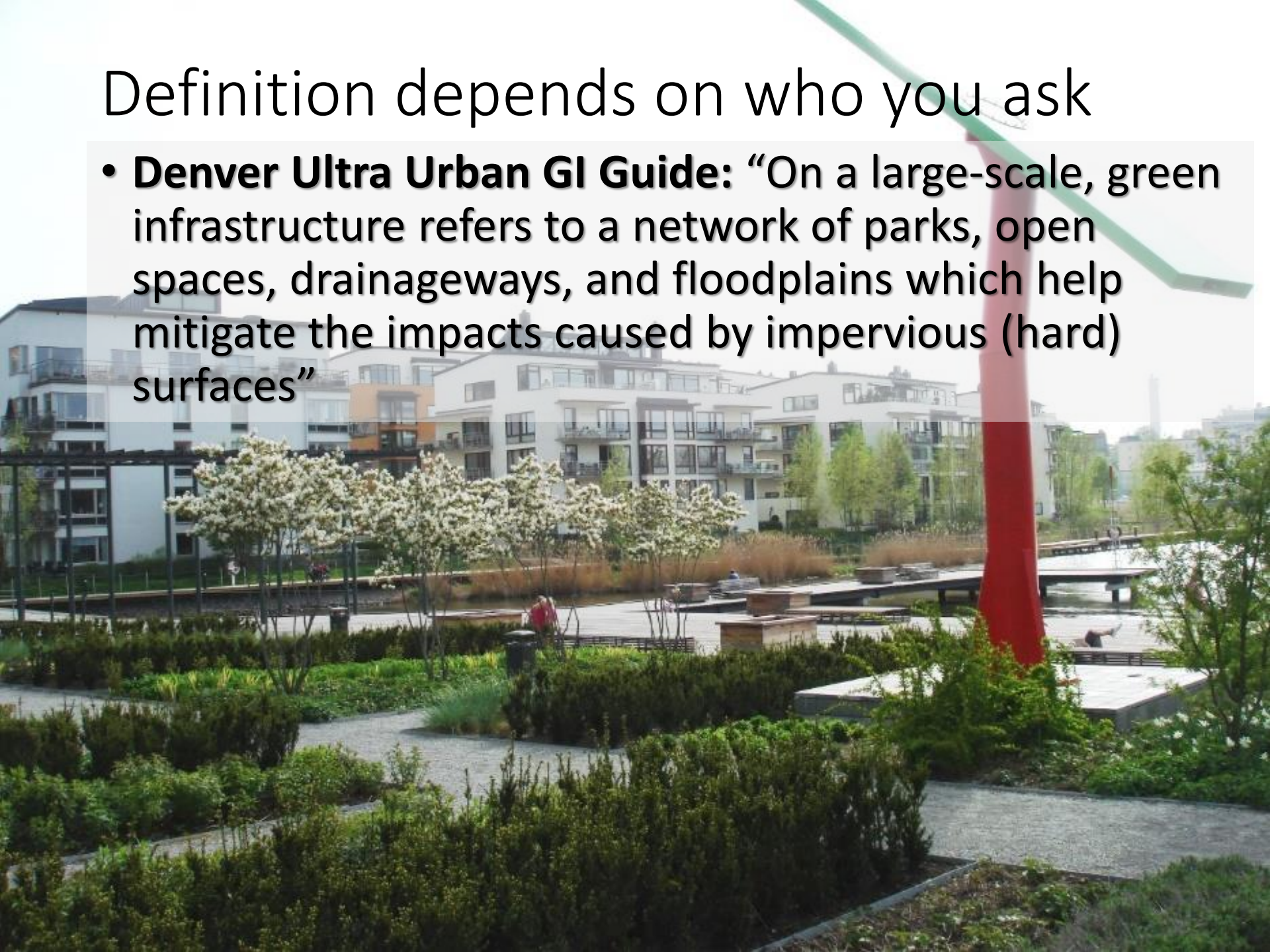
- **ALSA:** GI “covers everything from parks to street trees and green roofs to bioswales -- really anything that helps absorb, delay, and treat stormwater, mitigating flooding and pollution downstream. Green infrastructure also creates oxygen, sequesters carbon, and creates wildlife habitat”





# Definition depends on who you ask

- **Denver Ultra Urban GI Guide:** “On a large-scale, green infrastructure refers to a network of parks, open spaces, drainageways, and floodplains which help mitigate the impacts caused by impervious (hard) surfaces”





# Definition depends on who you ask

- **Conservation Fund:** “green infrastructure is a planned and managed network of natural lands, working landscapes and other open spaces providing many environmental benefits, including flood protection, cleaner air and water, wildlife habitats and parks.”





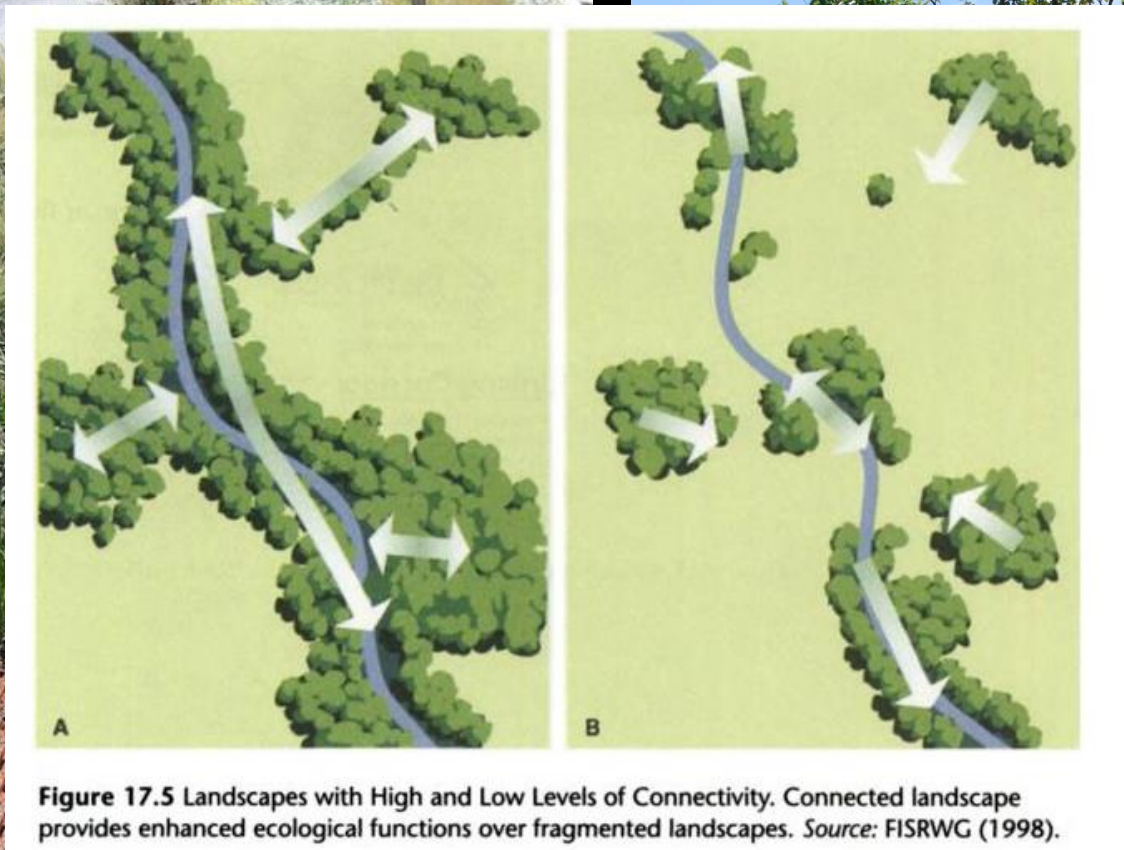
# Definition depends on who you ask

- **European Commission:** GI is “a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas.”



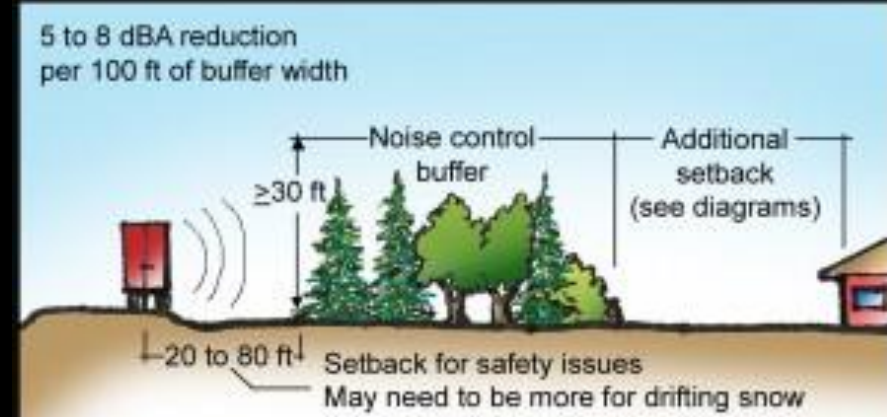


# GI Common assumptions



# Ultimately defined by benefits

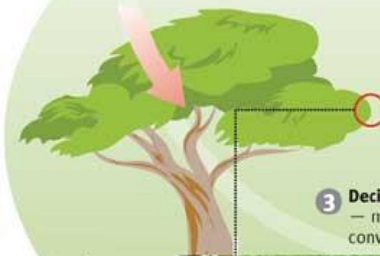
- Air: pollution filtration, noise buffering, GHG capture
- Temperature: shade, heat island
- Health: mental, physical activity
- Aesthetics: views, property values, retail
- Safety: traffic calming, crime reduction
- Social capital
- **Water: quality and timing**



## How trees scrub more pollution

Deciduous vegetation absorbs — through stomata pores on leaves — one-third more volatile organic pollution than previously believed.

Pollutants emitted by vehicles, lawnmowers, factories and other sources contribute to the toxic brown cloud hanging over metropolitan Denver.



List of tree leaves that absorb smog:

- Ash
- Apple
- Birch
- Hawthorn
- Hackberry
- Maple
- Pear
- Peach



Width of human hair





# GI -> LID

- Minimize:
  - Runoff amount and peaks
  - Impervious surfaces
  - Large infrastructure
- Maximize:
  - Natural materials
  - Aesthetics
  - Infiltration
  - Number and distribution of small scale BMPs
  - Multifunctionality (esp. for roofs, streets, parking)
  - Educational value of BMPs





# GI and Planning: Denver's “green roof ordinance”

