

Cultivating community participants to address urban watershed issues at multiple scales

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Watershed Management Group



Outline

- The Issues
- Our Approach:
 - grassroots to policy makers;
 - lot scale to river basins
- Community driven Green Infrastructure
- Building outward: where we are going

Water Supply



Urban Heat Islands



Stormwater as a Problem



Stone Underpass, Tucson, Arizona

www.watershedmg.org



Water Quality: Nonpoint source pollution



Grey Infrastructure



How did we come to this?



What to do?



Turning problems into solutions



Photo courtesy Brad Lancaster, harvestingrainwater.com

Stormwater as a resource: green infrastructure

AKA:

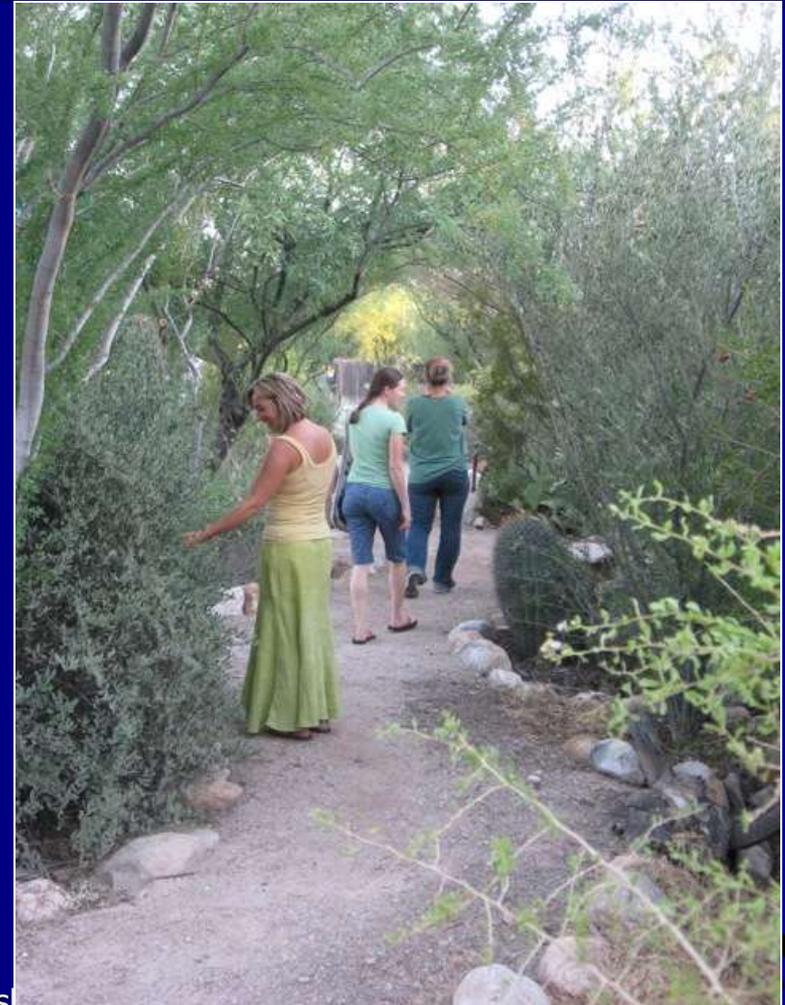
Water harvesting

Rain gardens

**Low Impact Development
(LID)**

**Sustainable Stormwater
Management**

**Best Management Practices
for Stormwater Quality
(BMPs)**



Our Approach



WMG Programs

*Grassroots Model:
Teach through actual
implementation & empower
everyday citizens*

Small Scale



Large Scale

- **Demonstration Sites**
- **Co-op**
- **Schoolyard Program**
- **Green Streets - Green Neighborhoods**
- **Water Harvesting Certification**
- **Conserve to Enhance**

International

- **Soil & Water Conservation**
- **Sanitation**

Demonstration Sites

www.watershedmg.org/demo-sites

Goal: Provide working examples of water harvesting features.
Raise community awareness and provide educational value



www.watershedmg.org



WMG Co-op

www.watershedmg.org/co-op

Goal: Community-building forum to make "green" practices affordable and assessable to all residents. To create a broad-base of local stewards.



www.watershedmg.org



Schoolyard Program

www.watershedmg.org/schoolyard

Goal: provide K-12 students applied understanding of their environment with a focus on water resources and native plants



www.watershedmg.org



Green Streets - Green Neighborhoods

www.watershedmg.org/green-streets

Goal: Help neighborhoods improve environment & quality of life through integrated green infrastructure approaches.



www.watershedmg.org



Water Harvesting Certification

www.watershedmg.org/certification

Goal: Train professionals, educators, and activists in integrated water harvesting practices to facilitate the spread of this knowledge and skill set to other communities. Create the highest quality standard available in the nation.



www.watershedmg.org



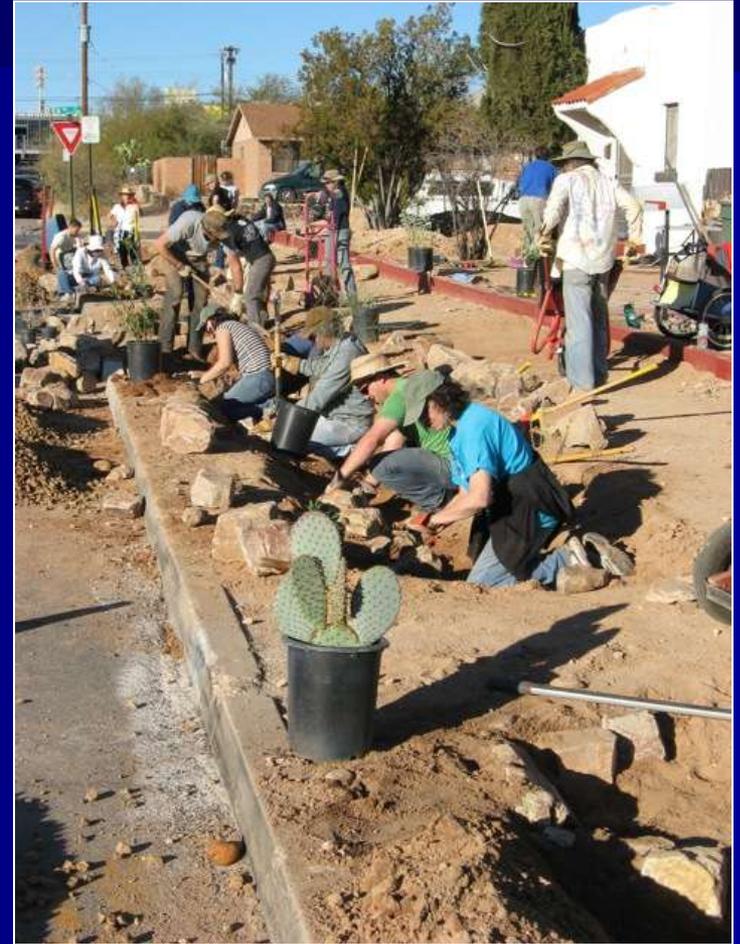
Conserve to Enhance

www.watershedmg.org/envi-water-bank

Goal: Link residential and commercial water conservation gains with riparian restoration efforts to designate water for the environment



Our Impact – Community & education



Neighborhood Leaders training



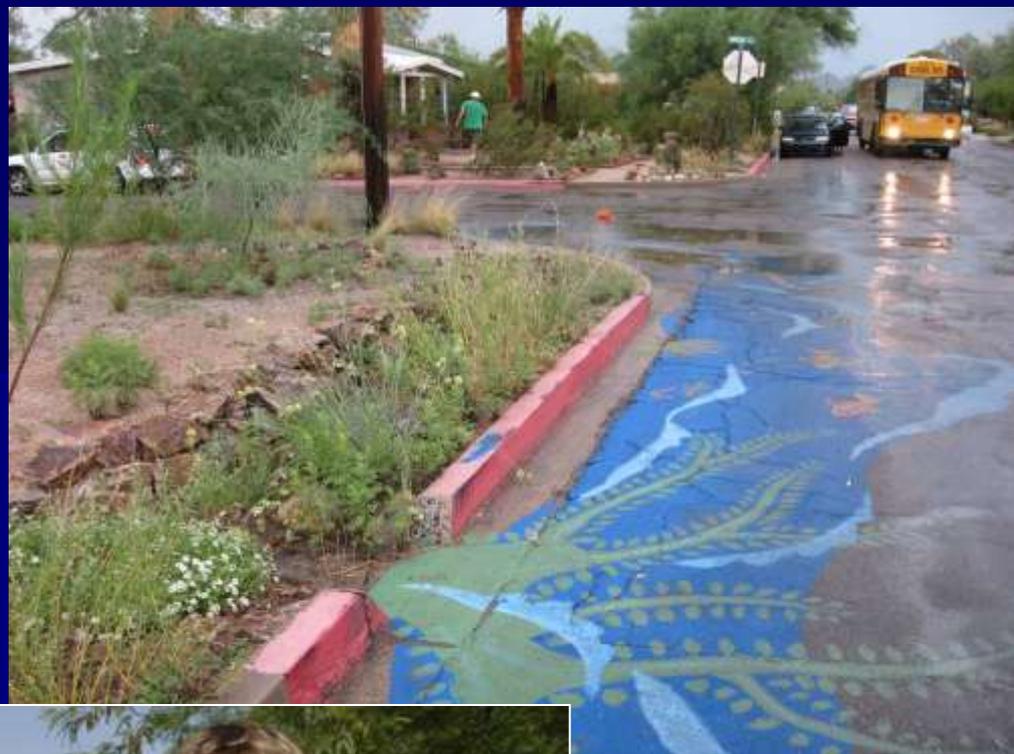
Educational results

- Significant improvements in knowledge and awareness
 - NPS
 - Watersheds
- 72% installed GI/BMPs at their home
- 25% worked with neighborhood to install GI/BMPs, 30% advocated for washes/watersheds

Key elements for success

- Working & strategic partnerships
- Motivated residents/stakeholders
- Integrated approach and solutions
 - Educational model:
 - Hands-on learning
 - Community building
 - Sense of accomplishment
- Right idea at the right time

Have Fun!



Developing Stewardship



Green Infrastructure?

What is it?

- A constructed feature that uses living, natural systems to provide environmental services:
 - Capturing stormwater
 - Cleaning and infiltrating stormwater
 - Creating wildlife habitat
 - Shading and cooling streets and buildings
 - Calming traffic

How can it help?

- Integrates disciplines => improved coordination
- Distributed small-scale efforts => connects individuals with process
- Increased understanding => increased stewardship

Resources: Green Streets Manual

Download at: watershedmg.org/green-streets

Green Infrastructure for Southwestern Neighborhoods



Version 1.0
July 2010



Resources: Green Streets Manual

Streetside practices: curb cut & basin, rock-lined edges

To collect and infiltrate stormwater from curb cuts into the right-of-way, bioretention basins must be excavated in the ROW to a depth below street level. Rocks are used to prevent erosion along the sides of the basin.

Function

Advantages

- Can be used to collect stormwater from streets into ROWs as narrow as 5' wide
- Rock edges create a delineated area for mulch and planting

Disadvantages

- Rock edges often stand out in landscape (for better or for worse)
- Rock edge and basin may be considered a trip and/or fall hazard
- Basin slopes can erode if not properly lined with well-placed rock

Site selection

- Follow site selection guidelines for curb cuts (p. 17) and vegetation (p. 9).
- Minimum width of earthen area between the

curb and sidewalk/path must be at least 6' wide in areas with on-street parking (5' without parking).

- Avoid streets with slopes greater than 5%.
- Maintain setbacks from above- and below-ground utilities as required.

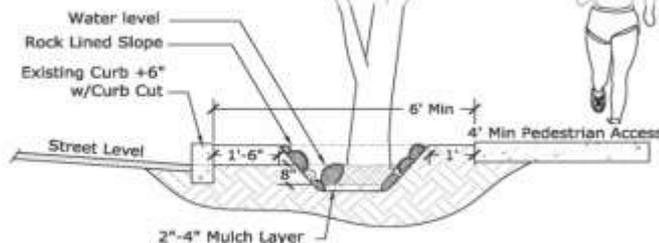
Design and construction

- Excavate bottom of basin 10"-12" below the surface of the street and backfill with 2"-4" of mulch (note: in Tucson, basins must not allow standing water deeper than 8". Excavating deeper and backfilling with mulch allows greater stormwater capacity - the most important thing is that the top of the mulch is at least 2" below the curb cut inlet).
- In areas where the slopes of the basin will exceed 33%, the edges of the basin must be lined with rock to prevent erosion (this is usually necessary where the ROW is less than 9' wide).
- Basins should be no longer than 20' in length, with 5' spacing between successive basins.
- Maximize the area of level bottom within site



constraints to maximize stormwater infiltration.

- In areas with on-street parking, preserve an 18" "step-out zone" of flat (sloped 1% toward basin) soil or gravel next to curb to allow passengers to step in and out of vehicles.
- Preserve a 1' flat (sloped 1% toward basin) area next to pedestrian pathway or sidewalk
- If sidewalks are not present, preserve a minimum 4' flat pedestrian pathway within the ROW (sloped 1% toward basin).
- Curb cut should be both the inlet and the overflow outlet of the basin. To achieve this, the bottom of the curb cut should be at least 4" below any other point along the edge of the basin. This step is imperative to ensure that overflow exits back onto the street and not onto adjacent properties. The more a site is sloped, the shorter the basin must be to maintain these levels.
- Create planting shelves along the basin to support native trees and shrubs. Be sure planting shelves do not block flow of storm-



Typical cross-section of a basin with rock-lined edges, showing typical setbacks for a site on a residential street with on-street parking (for plan view of this practice, see Appendix).

Green Infrastructure Practices

On-site Practices

- Downspout re-direction
- Parking Lots
- Retrofit detention basins

Behind Curb

- Curb cut with bio-retention basin
- Swales and Berms

In-Street

- Chicane
- Street width reduction
- Traffic Circle
- Center Median

Other Public Areas

- Pocket Parks
- Green Alleyways

On-site Retrofits



Neighborhood Right-of-Ways



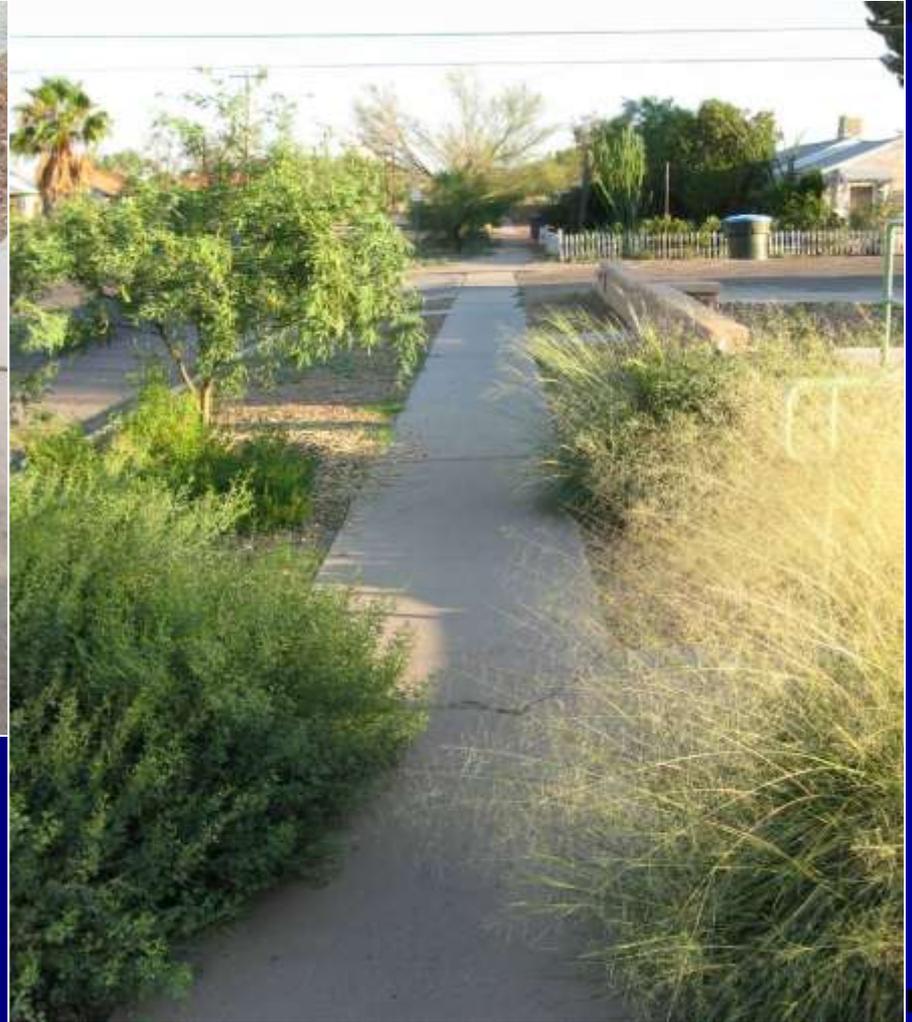
Before



After



www.watershedmg.org



Key questions that remain

- Maintenance
 - Design challenges
 - Accumulation/disposal of persistent NPS pollutants
- Serving low-income neighborhoods
- Sustainability of funding



Thank you!

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