

# Green Infrastructure Operation and Maintenance in the City of Los Angeles

*“stormwater runoff as a resource”*

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# City of Los Angeles

- Second most populous city in the United States (4 million people)
- 465 square miles
- Semi-Arid - average rainfall of less than 15 inches/year
  - ranging from as little as 3" to as much as 40"





# LA Sanitation Overview

## Three primary programs:

### Solid Resources

Collect 1 million tons of refuse from our 750,000 customers annually,

Collect 240,000 tons of recyclables and 480,000 tons of yard trimmings annually.

Expand recycling program to 540,000 multifamily households by end of 2008.

Made bulky item pickup available for all residents (single family and multifamily households).

### Wastewater

Convey and treat 550 million gallons per day

Recycle 80 million gallons per day

Beneficially reuse 700 wet tons per day of biosolids

### Watershed

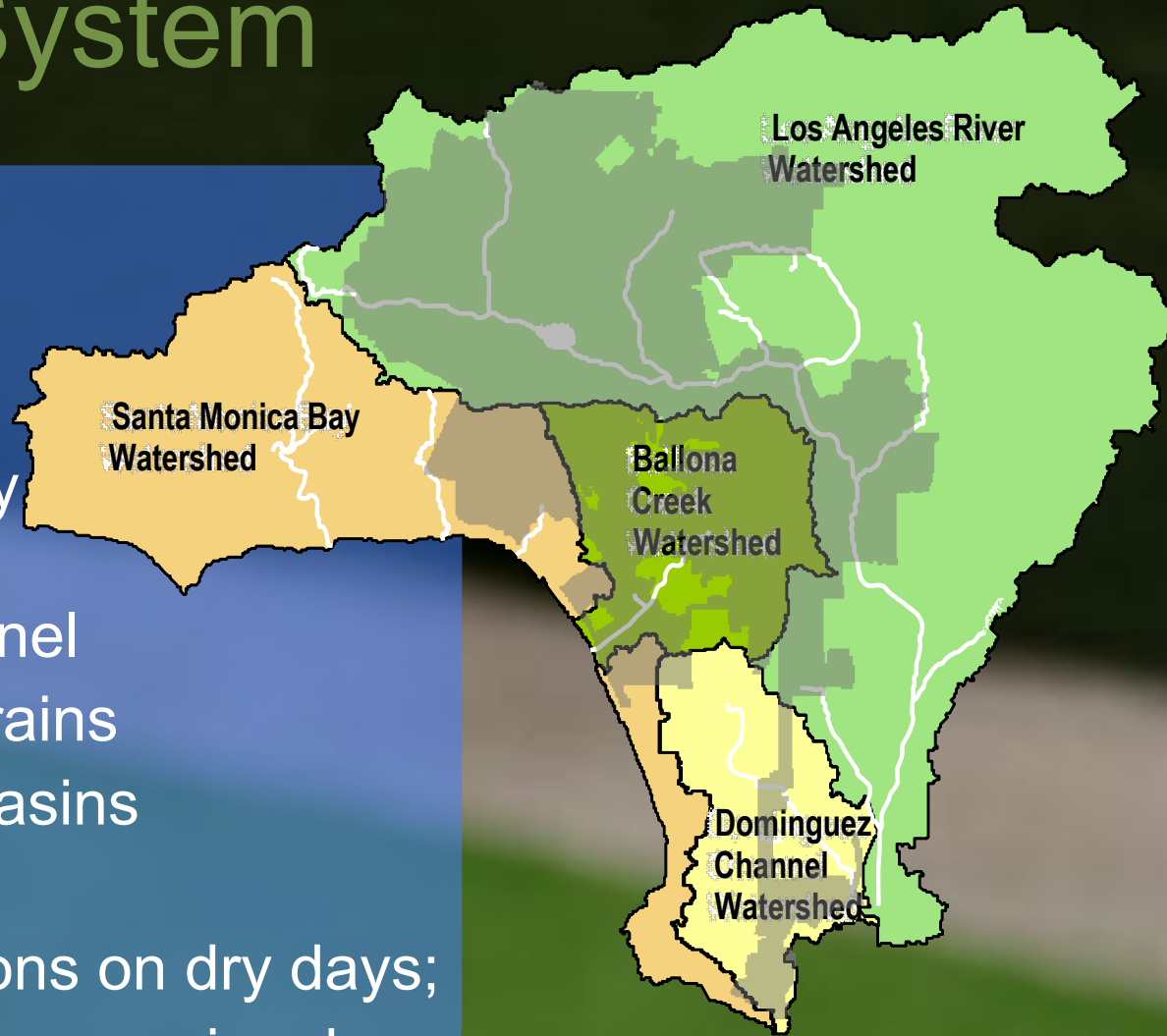
Protect the beneficial uses of our receiving waters,

Over 100 million gallons per day of dry-weather urban runoff are discharged to the waterways.



# Stormwater System

- Watersheds
  - L.A. River
  - Ballona Creek
  - Santa Monica Bay (North & South)
  - Dominguez Channel
- 1,500 mi. of storm drains
- Over 38,000 catch basins
- Stormwater Flow:  
Tens of millions gallons on dry days;  
Over 10 billion gallons on rainy days



# Municipal Stormwater Permit

*22 TMDLs impact City of LA out of the 32 in permit*

## Los Angeles River Watershed

- LA River Trash
- LA River Nitrogen
- LA Harbor Bacteria
- LA River Metals
- LA River Bacteria
- Echo Park Lake Toxics
- Lincoln Park Lake Trash, Nutrients

## Santa Monica Watershed

- Santa Monica Bay Beaches Bacteria (Dry Weather, Wet Weather)
- Marina Del Rey Bacteria
- Marina Del Rey Toxics
- Santa Monica Bay Nearshore & Offshore Debris
- Santa Monica Bay Toxics

## Ballona Creek Watershed

- Ballona Creek Trash
- Ballona Creek Metals
- Ballona Creek Toxics
- Ballona Creek Bacteria
- Ballona Creek Wetlands

## Dominguez Channel Watershed

- Machado Lake Trash
- Machado Lake Nutrient
- Machado Lake Toxics
- Dominguez Channel/ LA Harbor Metals and Toxics



# Why Green Infrastructure?

- Improve water quality
- Increase water supply
- Reduce flooding
- Save on energy use
- Adapt to climate change
- Provide open space for habitat and recreation



# Green Infrastructure (LID)-Private



*Cisterns -  
Lowe's*



*Rain Barrels, Rain Gardens  
at single family residences*



*Planter Boxes - Versailles  
Luxury Apartments  
Oxford St, Los Angeles*



*Infiltration - Costco*

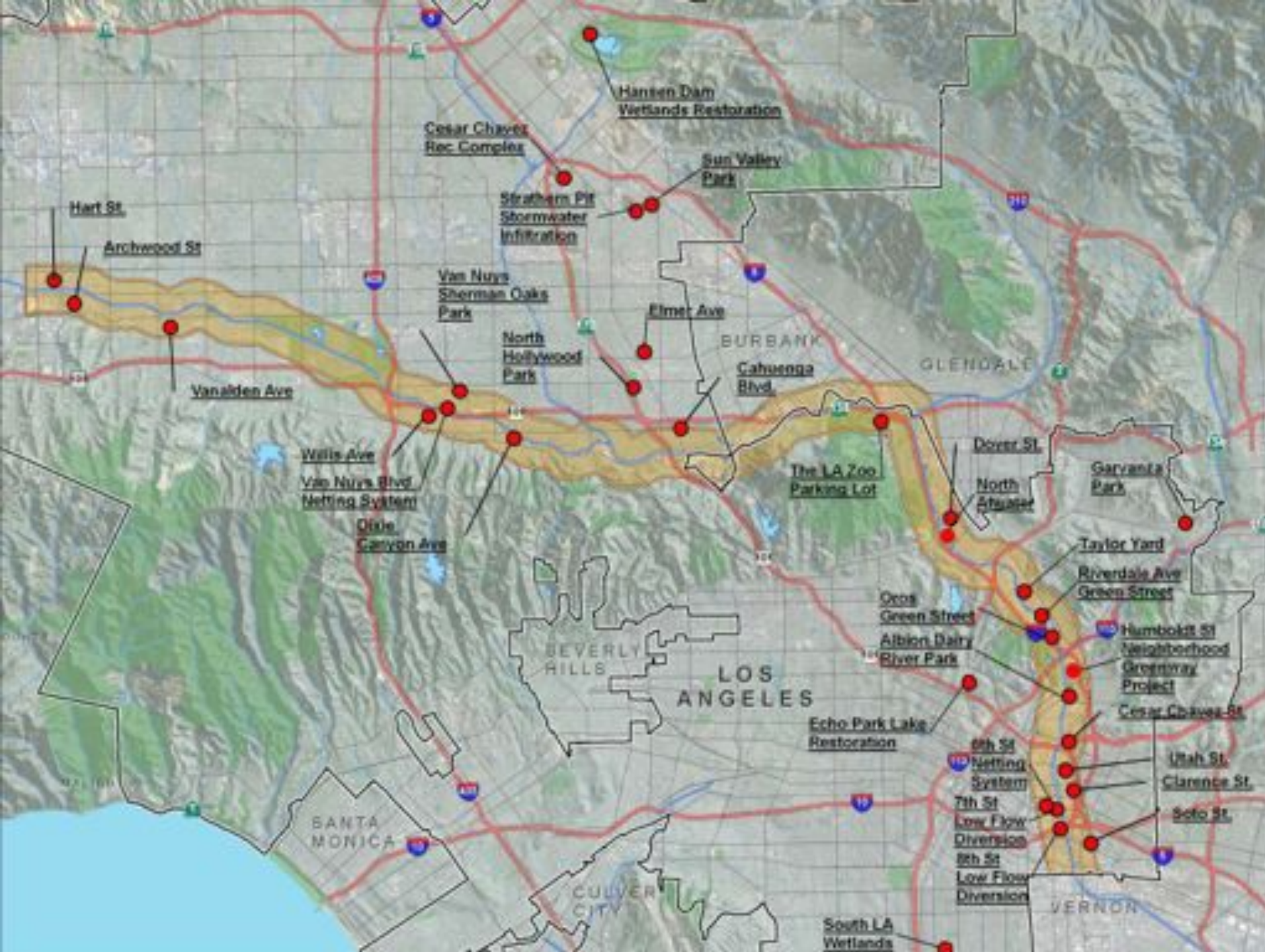


*Bioretention - Sam's Club  
Parking Lot*



*Parkway Infiltration Swale  
11<sup>th</sup> St & Hope St - Los Angeles*







# *Hansen Dam*



# *Elmer Ave Green Street*



*Before*



*After*



# *Elmer Paseo Green Alley*



*Before*



*After*

# Glen Oaks Ave



*Before*



*After*





# Woodman Avenue

*Before*



*After*



# *North Hollywood Alley*





# *LA Zoo Green Parking Lot*



*Before*

*After*

# ***North Atwater Stream Restoration and Park Expansion***



*Before*



*After*



# *Echo Park Lake Rehabilitation*



*Before*



*After*

# ***Garvanza Park***





# *Oros Green Street*

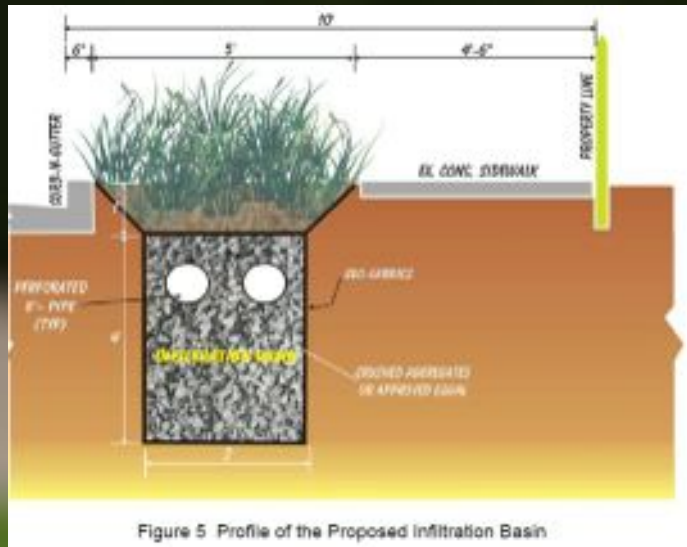


*After*

*Before*



# Riverdale Green Street





# *Ed P. Reyes River Greenway (Humboldt)*



*Before*



*After*

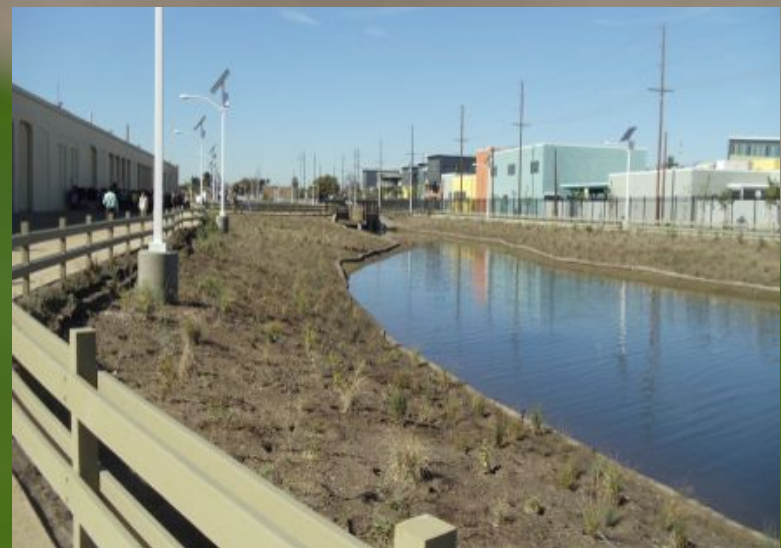
# *South Los Angeles Wetlands Park*



*Before*



*After*





# ***Westside Park***



*Before*



*After*



# Manchester Neighborhood Greenway



Before



After





# *Avalon Ave Green Alley*



*Before*



*After*



# Why Operations and Maintenance?

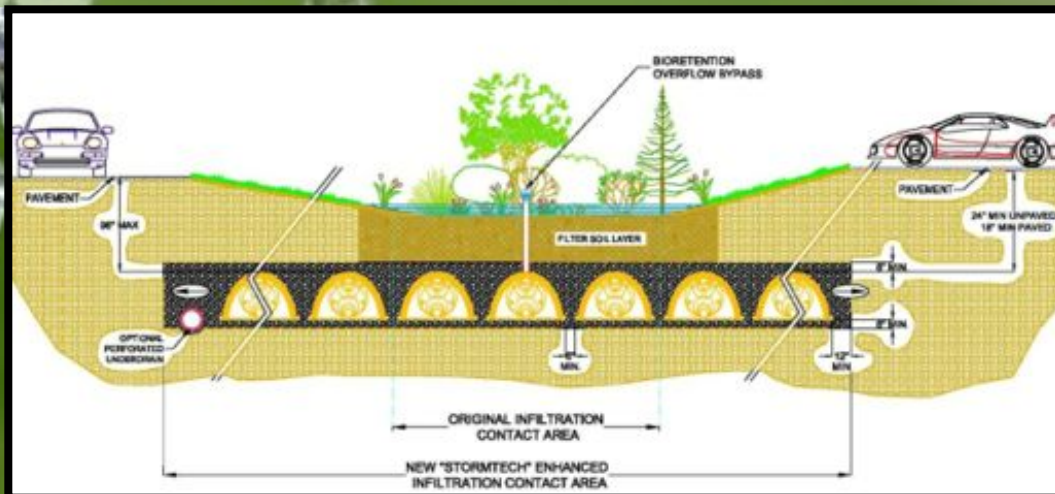
- Performance
- Visibility
- Safety
- Protection of Investment
- Continuity





# Challenges

- Funding
- Responsibilities
- Performance
- Knowledge and Expertise
- Aesthetics
- Regulatory Alignment (Public Health, Vector Control)
- Community Partnership



# Lessons Learned So Far

- Design and Construct with O&M in mind
- Staff Training and Buy-in (new disciplines)
- Incorporate Optimization
- Clearly Define Responsibilities Early
- All Funding Measures include O&M Funding
- “Stewardship”





# Today's Dialogue

Your Challenges

Your Lessons Learned

# Questions

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*Additional Information:*

*[www.lacity.org](http://www.lacity.org) or [www.lastormwater.org](http://www.lastormwater.org)*



[www.facebook.com/lastormwaterprogram](http://www.facebook.com/lastormwaterprogram)



[www.youtube.com/user/lastormwaterprogram](http://www.youtube.com/user/lastormwaterprogram)



[www.lastormwater.org/blog/](http://www.lastormwater.org/blog/)

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