

# Planning the Village of Tomorrow

Climate Adaptation Considerations

**2<sup>nd</sup> Assembly of Planners' 2016 Symposium**

Tumon, Guam

November 30, 2016



# Projected Impacts: *Guam*

	Low-Mid Scenario	High Scenario
Average Annual Temperature 2080-2099	↑3°F	↑6°F
Average Annual Rainfall 2080-2099	Insignificant	↓10-15%
Average Annual Rainfall – Wet Season 2080-2099	↑10% - ↓10%	↓10%-20%
Average Annual Rainfall – Dry Season 2080-2099	↑10% - ↓10%	↑10%-20%
Average Annual Typhoons	Slight decrease	Decrease



Source: Planning With High-Resolution Climate Projects for Guam, PICSC. Projections: C. Zhang, Y. Wang. Presentation: V. Keener

# Projected Impacts: *SLR & Surges*



SLR poses one of the most widely recognized climate change threats to low-lying coastal areas on islands and atolls (*high confidence; robust evidence, high agreement*). {29.3.1} It is *virtually certain* that global mean SLR rates are accelerating. {WGI AR5 13.2.2.1} Projected increases to the year 2100 (RCP4.5: 0.35 m to 0.70 m) {WGI AR5 13.5.1; Table 29-1} superimposed on extreme sea level events (e.g., swell waves, storm surges, El Niño-Southern Oscillation) present severe sea flood and erosion risks for low-lying coastal areas and atoll islands (*high confidence*). Likewise, there is *high confidence* that wave over-wash of seawater will degrade fresh groundwater resources {29.3.2} and that sea surface temperature rise will result in increased coral bleaching and reef degradation. {29.3.1.2} Given the dependence of island communities on coral reef ecosystems for a range of services including coastal protection, subsistence fisheries, and tourism, there is *high confidence* that coral reef ecosystem degradation will negatively impact island communities and livelihoods.

WG II

WORKING GROUP II CONTRIBUTION TO THE  
FIFTH ASSESSMENT REPORT OF THE  
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



Source: *Climate Change 2014: Impacts, Adaptation, and Vulnerability, Part B: Regional Aspects, Contribution of Working Group II; Fifth Assessment Report. IPCC.*



# What We See Now

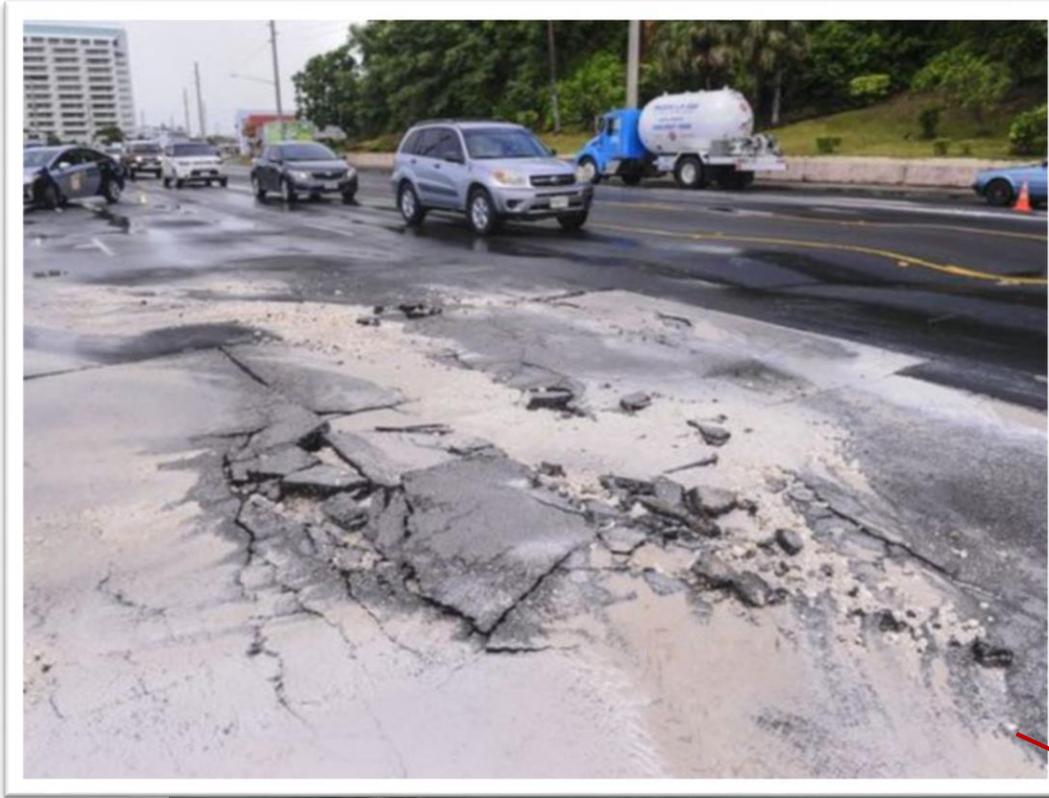


**flooding**



# What We See Now

**erosion & infrastructure vulnerability**



# What We See Now



**drought**

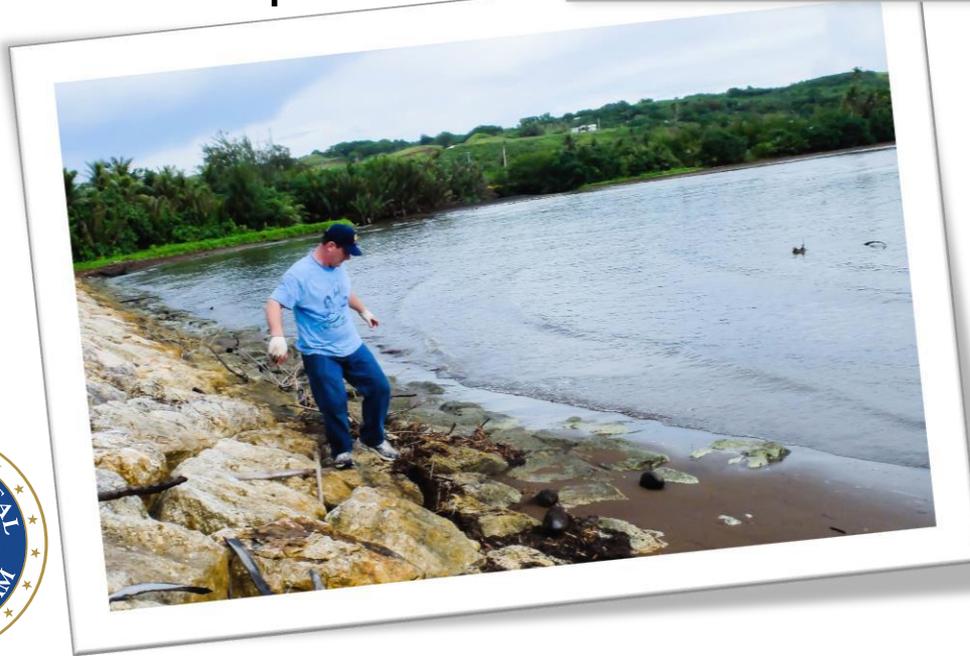


**fires**



# Guam's Priorities

- **Protect** Guam's economy and natural resources
- **Build resilience** in Guam's infrastructure
- **Promote** responsible development & sustainable practices



- **Reduce vulnerabilities** from regional climate migration
- **Enhance disaster risk management**
- **Revise/influence policy**



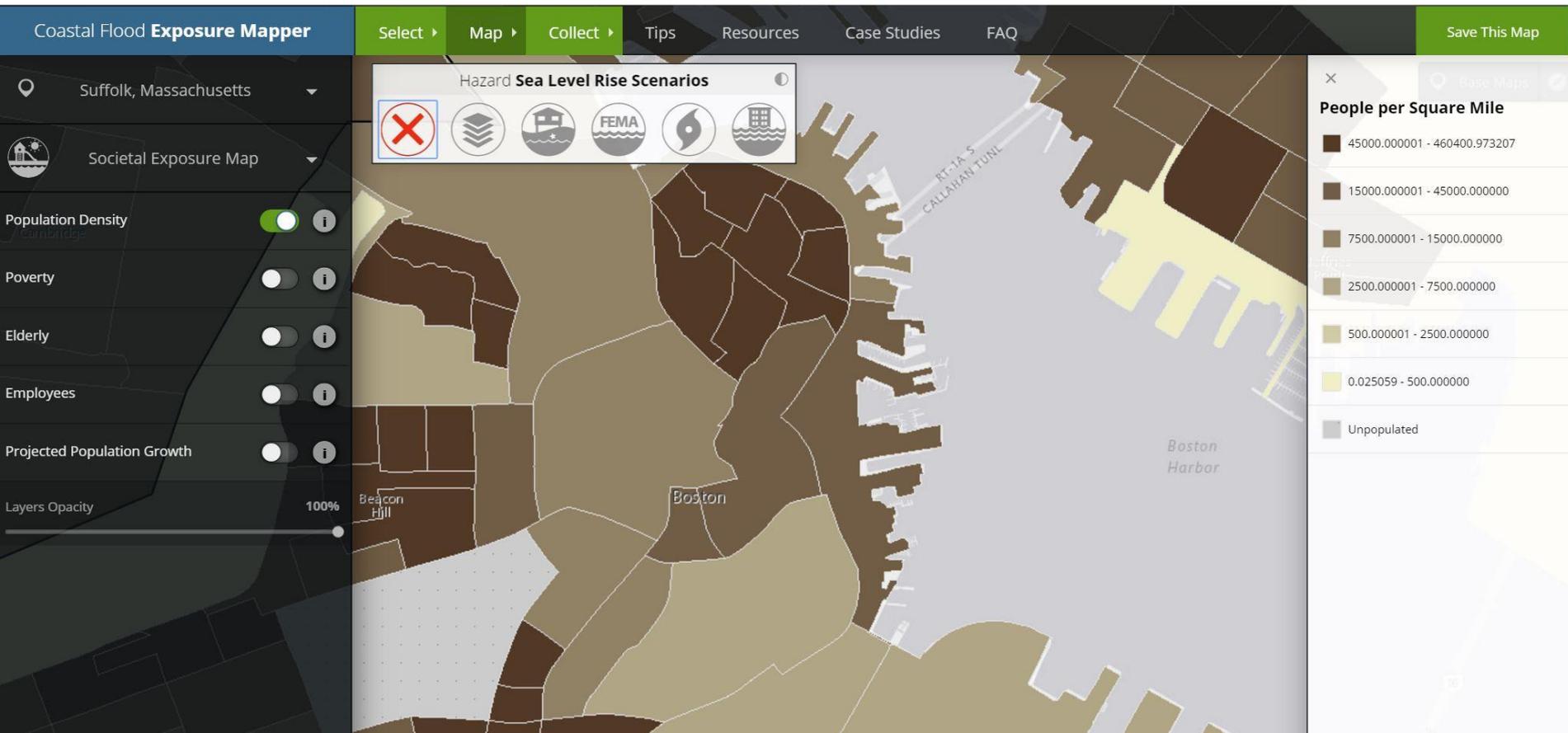
**We must change  
the way we think  
about how we:**

- Plan**
- Construct**
- Maintain**
- Operate**



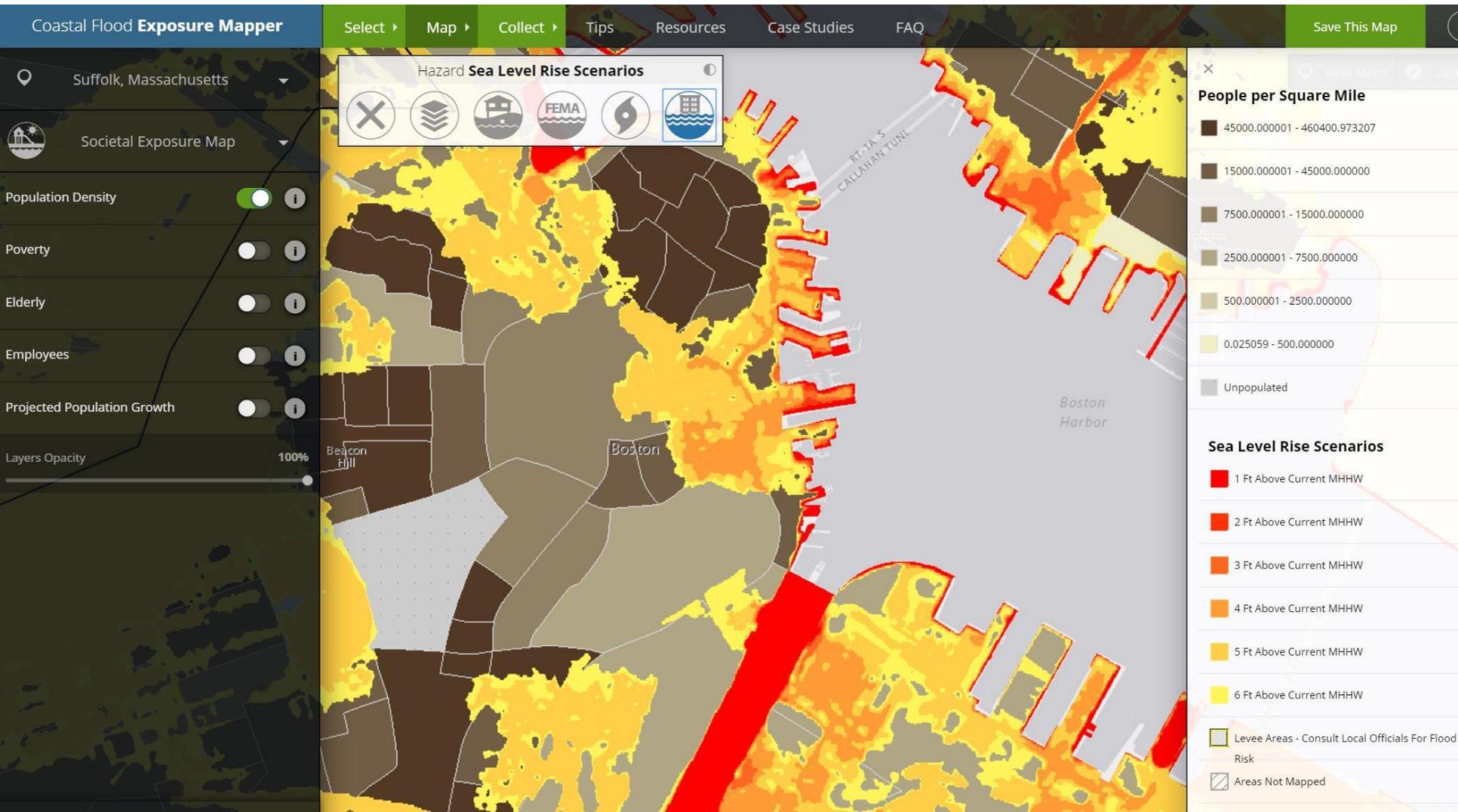
# Partnerships: *Use Existing Resources*

How would you plan for future land use if current population density information is provided?

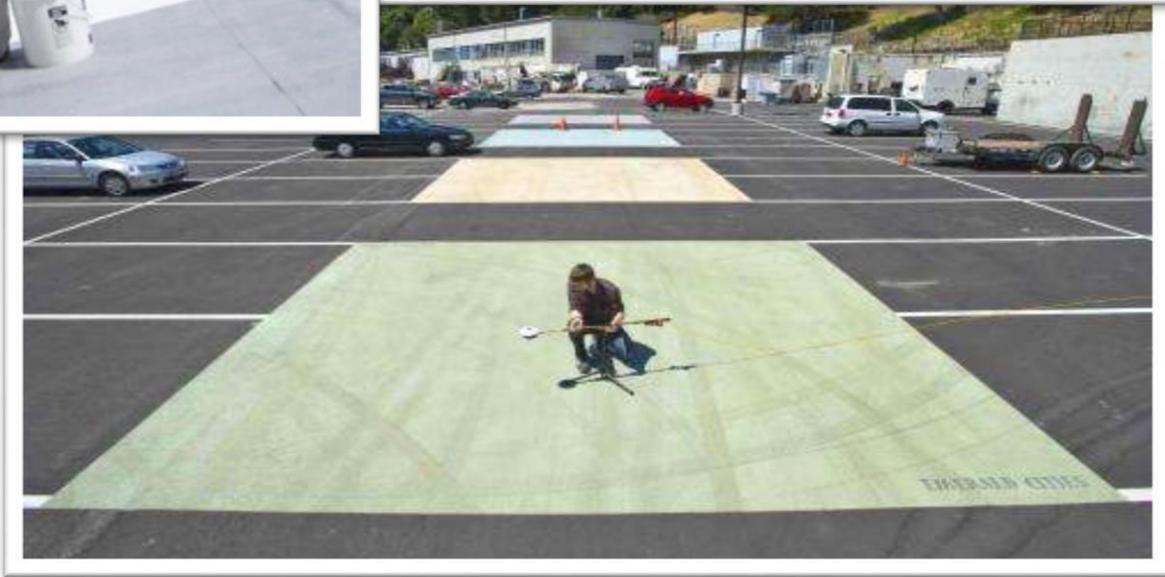


# Partnerships: *Use Existing Resources*

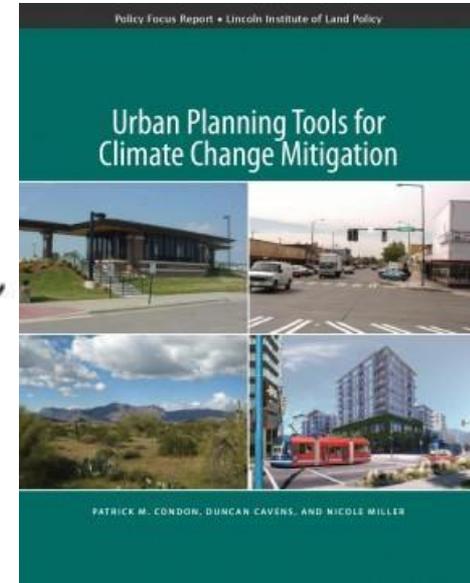
Would your approach change if projected SLR scenario information was provided?



# Innovative Products



# Consider Comprehensive Planning



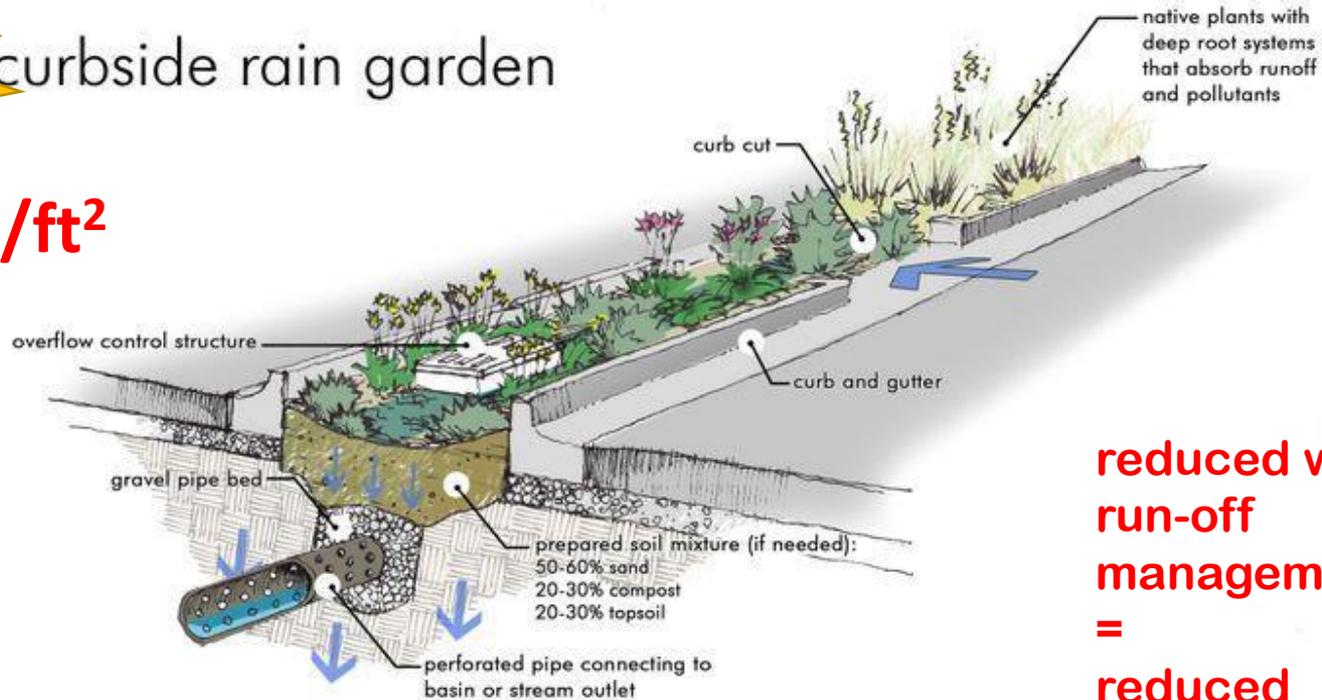
**American Planning Association**  
*Making Great Communities Happen*

# BIO-SWALES: *Collateral Damage & Unintended Beneficiaries*

curbside rain garden

\$\$\$\$

**\$3-\$10/ft<sup>2</sup>**



**reduced water  
run-off  
management**

**=**

**reduced  
infrastructure and  
O/M costs**



GAME-CHANGER

there is no box



# How We Can Help Create the Village of Tomorrow?

1. Live now but plan for the future: ***consider projected impacts of climate change in your long-term plans.***
2. Be connected: ***gather stakeholders and partners to create a comprehensive plan.***
3. Keep flexible: ***be able to adjust your plans to incorporate amended projections, emerging technology, and best management practices.***

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