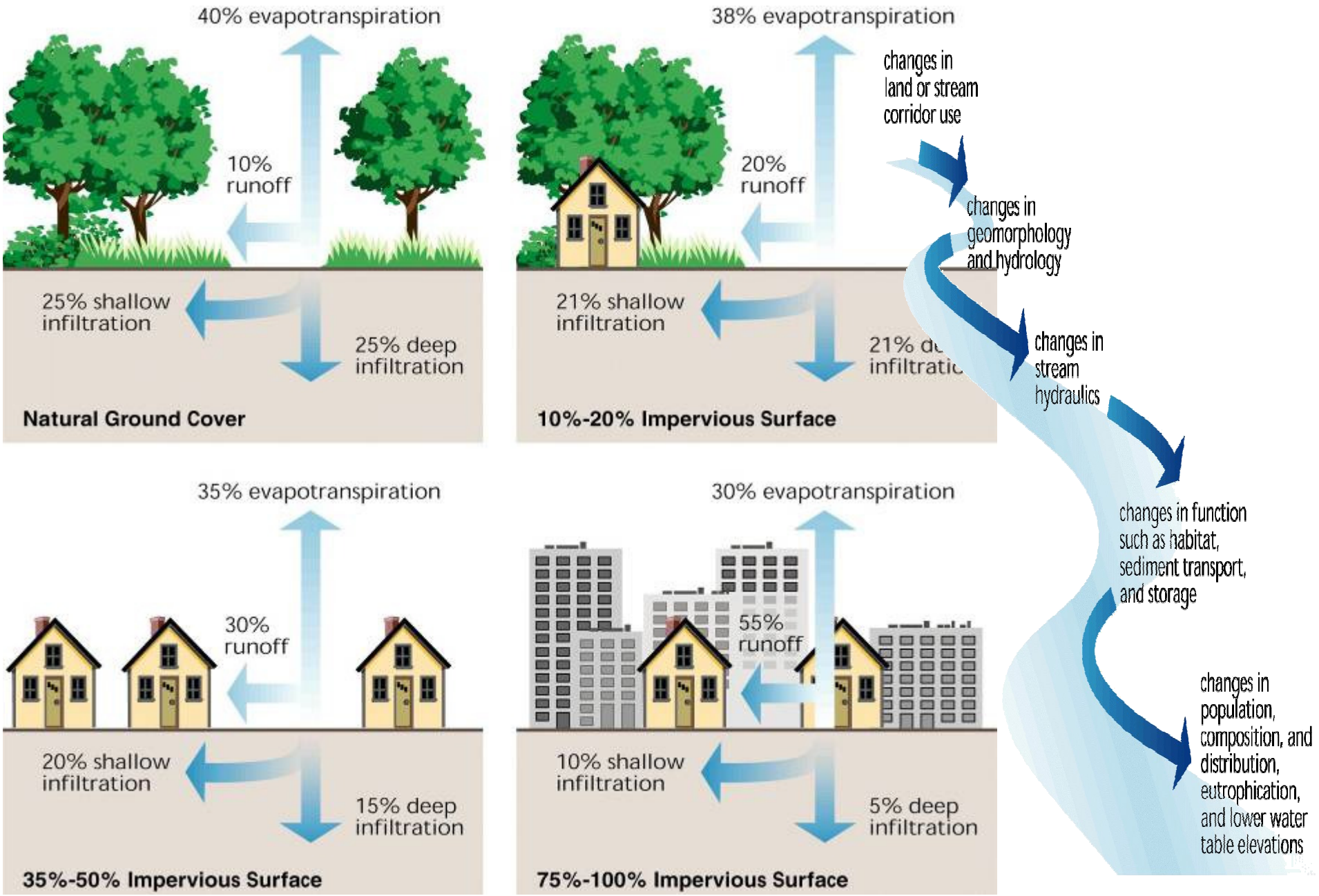
Office of Water

U.S. Environmental Protection Agency

Sustainable Water Infrastructure and Urban Development

Ensuring safe and clean water for all Americans

Healthy Watersheds ***Sustainable Communities***



Source: FISRWG 2001

Challenges of Sprawl

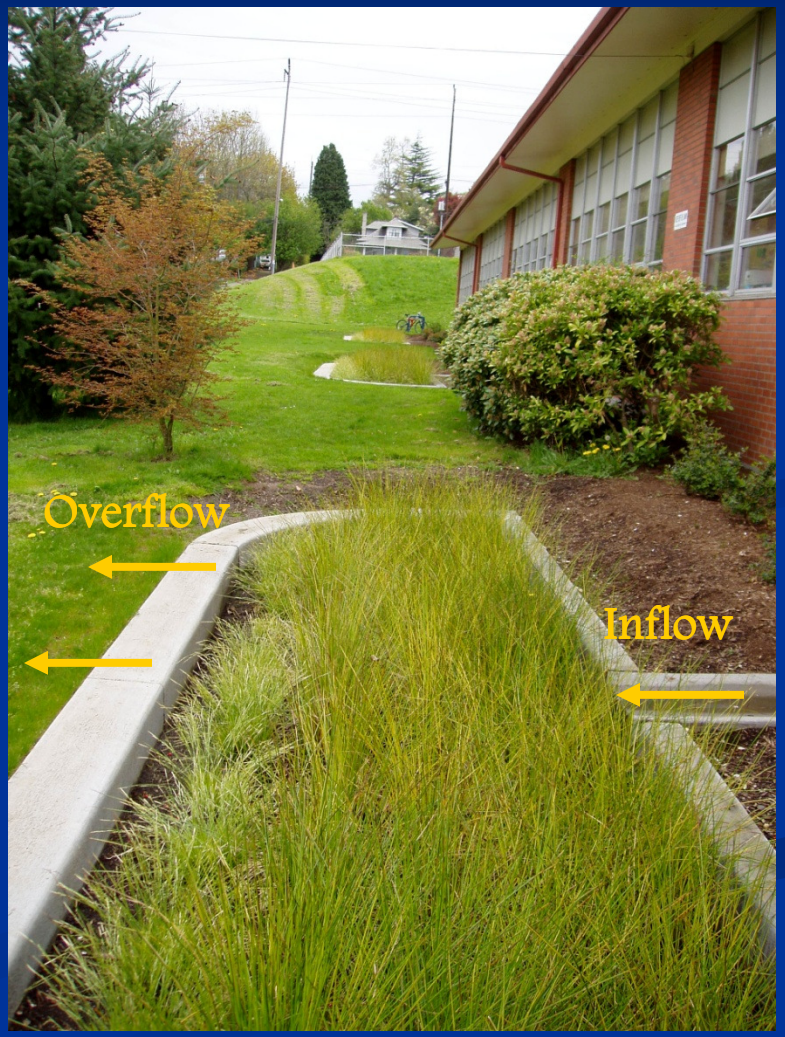
Spread-out housing → spread-out roads and services → increased pollution and vehicle miles

Paradigm Shift:
Rain is a resource, not a burden

- Shift from the concept of moving stormwater as far away as quickly as possible in large, buried collection and conveyance systems.

- Shift towards the concept of managing stormwater the way mother nature would do it: where it falls, with plants and soils.

Maximize Retention to Minimize Runoff



Water-Quality Benefits

- Reduces sewer overflows
- Filters polluted stormwater
- Recharges groundwater
- Protects stream banks
- Conserves water
- Prevents flooding

Non-Water Quality Environmental Benefits

- Climate change mitigation
- Improved air quality
- Energy savings
- Increased water supply
- Wildlife habitat

Community Benefits

- Increased recreation opportunities
- Job creation
- Increased property values
- Cost savings
- Market creation
- Reduced crime
- Improved mental functioning

2009 Philadelphia Triple Bottom Line Analysis
Citywide Present Value Benefits: Cumulative through 2049

Benefit Categories	50% LID option (2009 million USD)	30' tunnel option (2009 million USD)
Increased recreational opportunities	$ 524.5	
Improved aesthetics/property value (50%)	$ 574.7	
Reduction in heat stress mortality	$ 847.1	
Water quality / aquatic habitat enhancement	$ 336.4	$ 189.0
Wetland services	$ 1.6	
Social costs avoided by green collar jobs	$ 124.9	
Air quality improvements from trees	$ 131.0	
Energy savings / usage	$ 26.6	$ (7,324.1)
Reduced (increased) damage from SO_2 and NO_x emissions	$ 43.8	$ (2,838.9)
Reduced (Increased) damage from CO_2 emissions	$ 11.1	$ (745.8)
Disruption costs from construction and maintenance	$ (5.6)	$ (10,524.5)
TOTAL	**$ 2,616.0**	**$ (21,244.3)**

Approaches

- Community involvement
- Green infrastructure
- Smart growth
- Voluntary programs
- Regulation

Community Involvement

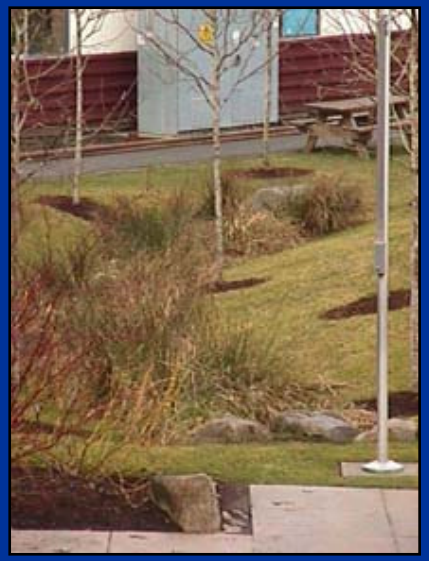
- **Urban Waters Initiative**: Federal Partnership to reconnect communities to their urban waters
  - Help communities access, improve and benefit from their water environments
  - Emphasis on underserved communities

- **America's Great Outdoors**: White House initiative to reacquaint Americans with the outdoors, both in developed and natural areas

Green infrastructure techniques

Bioinfiltration

Pocket wetlands



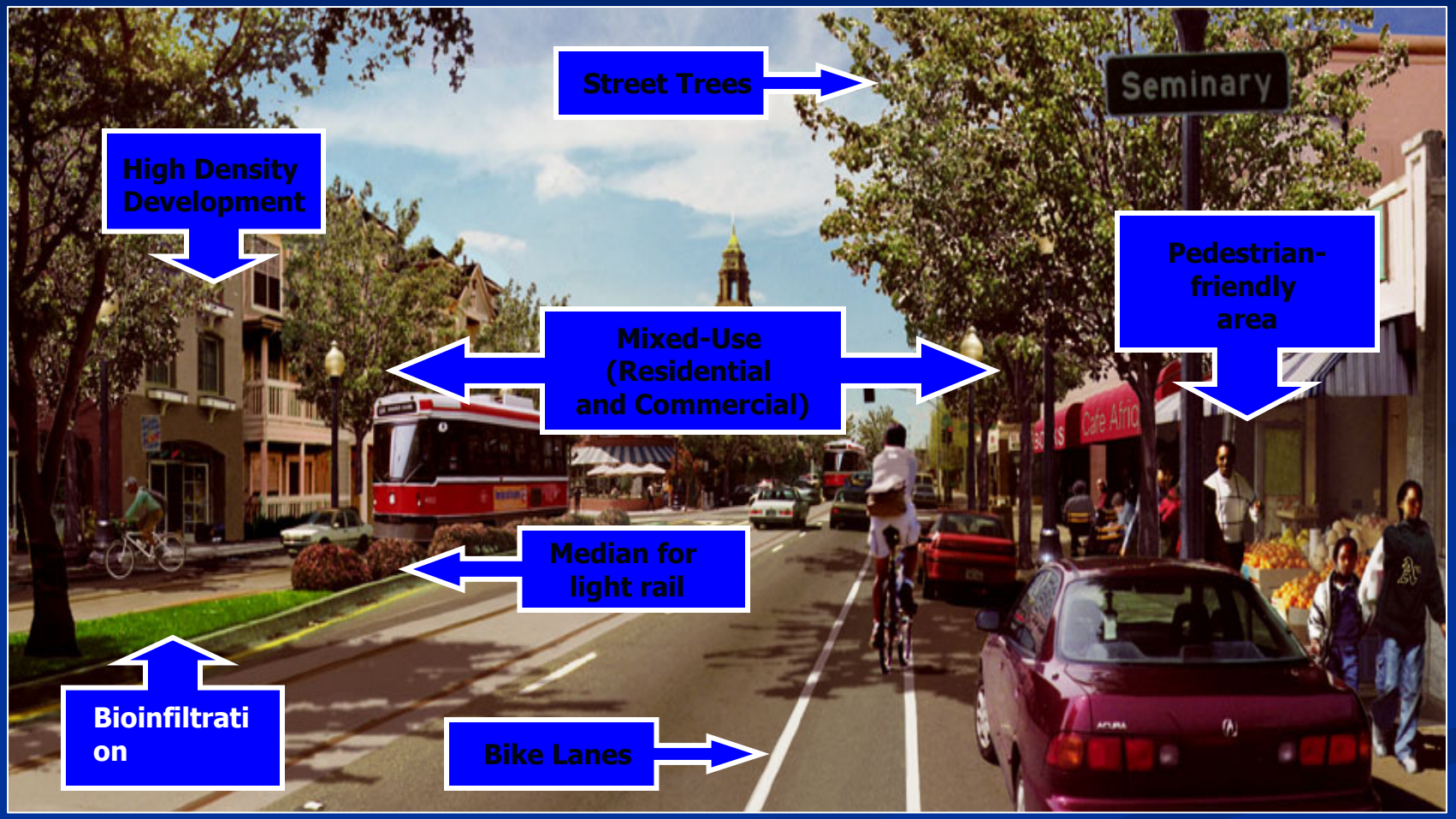
Open swales

Green roofs/walls

Smart Growth:
Development as Part of the Solution

- Preserve
  - Natural features
- Recycle
  - Land and infrastructure
- Reduce
  - Land consumption
- Reuse
  - Stormwater

Street Design Using Smart Growth



Philadelphia in 2025

photo courtesy of Howard Neukrug, City of Philadelphia

Smart Growth – Redevelopment Case Study

- Atlantic Station in Atlanta, Georgia
- Former steel mill site redeveloped with EPA's help
- 138 acres of LEED-certified office space, retail and residential buildings
- Residents drive half of what average Atlantans do
- Reduced Atlanta's stormwater discharge by almost 20 million cubic feet/year

Atlantic Station

EPA Voluntary Programs

- HUD-DOT-EPA Partnership for Sustainable Communities
  - Promoting "Fix It First" strategy
  - Echoed in SRF policy
- CWSRF pilot projects
- Green Infrastructure Partnership
  - Over 90 that support and promote using green infrastructure to reduce stormwater pollution

EPA's Regulatory Tools for Stormwater Management

- Stormwater rulemaking
- Construction and Development Effluent Limitation Guidelines
- Municipal Separate Storm Sewer System (MS4) Permit
- Enforcement Settlements