

NJ Future CSO Permittee Meeting

Best Practices

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Getting the Best LTCP

- CSO controls will be expensive
- Include Best Practices to
 - Maximize visible and tangible benefits
 - Create and maintain public support
 - Reduce costs



Phased Implementation Controls Costs

CSO Control Strategy	Techniques	Level of Effort	Life-Cycle Cost	CSO volume	Co-benefits
Minimize inputs to the combined sewer	Water conservation programs	✓	✓	✓	✓✓✓
	Green infrastructure	✓✓	✓✓	✓✓✓	✓✓✓✓
	Development standards	✓	✓	✓✓✓	✓
	Infiltration/inflow removal	✓✓✓	✓✓✓	✓✓✓	✓
	Tide gate repair	✓	✓✓	✓	✓
	Sewer separation	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Maximize conveyance capacity of existing system	Catch basin cleaning	✓✓	✓✓	✓	✓✓
	FOG programs	✓✓	✓✓	✓	✓✓
	Smart infrastructure and O&M	✓	✓✓	✓	✓✓
	Interceptor cleaning	✓✓	✓✓	✓✓	-
Maximize storage capacity of the existing system	Weir adjustments	✓✓✓	✓✓✓	✓✓✓	-
	In-line storage	✓✓✓✓	✓✓✓✓	✓✓✓	-
	Off-line storage (tanks/tunnels)	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓	-
Maximize treatment	Outfall disinfection	✓✓✓	✓✓✓	*	-
	Treatment Plant upgrade	✓✓✓✓✓	✓✓✓✓	✓✓✓	✓✓
*reduces pathogens but does not reduce CSO volume					

System Optimization

- Reduce the volume of flow entering the CSS and POTW during rain events
- For implementation in both CSS and separated areas
 - Potable water conservation
 - Reduction of excessive Infiltration and Inflow (I&I) in separate and combined sewer systems
- For implementation in CSS areas
 - Blue roofs, cisterns, underground storage tanks
 - Reduce peak flow rates during wet weather

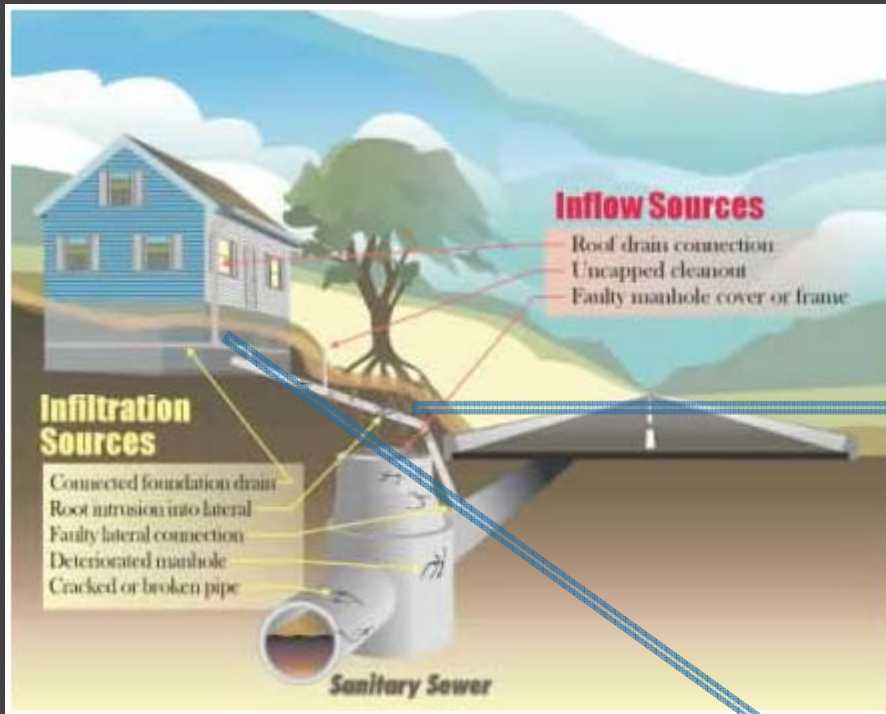


Water Conservation

- Effects
 - Reduces dry weather sewage flows
- Benefits
 - More plant capacity allows more wet weather flow to be treated
 - More sewer capacity allows for more transmission
- Approaches
 - Advanced metering
 - Monthly billing
 - Conservation rate structure
 - Toilet and fixture replacement programs

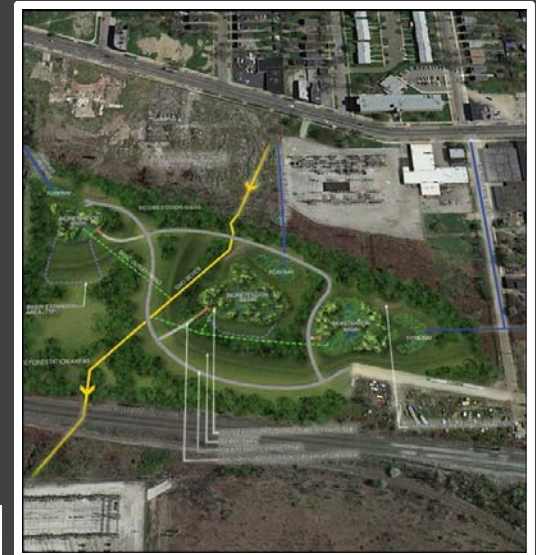


Inflow Reduction



Green Infrastructure

- Allows for stormwater management close to its source
 - Pervious pavements
 - Street bump-outs
 - Rain gardens
 - Enhanced tree Pits
 - Green roofs
 - Infiltration Swales



Combining GI and System Optimization

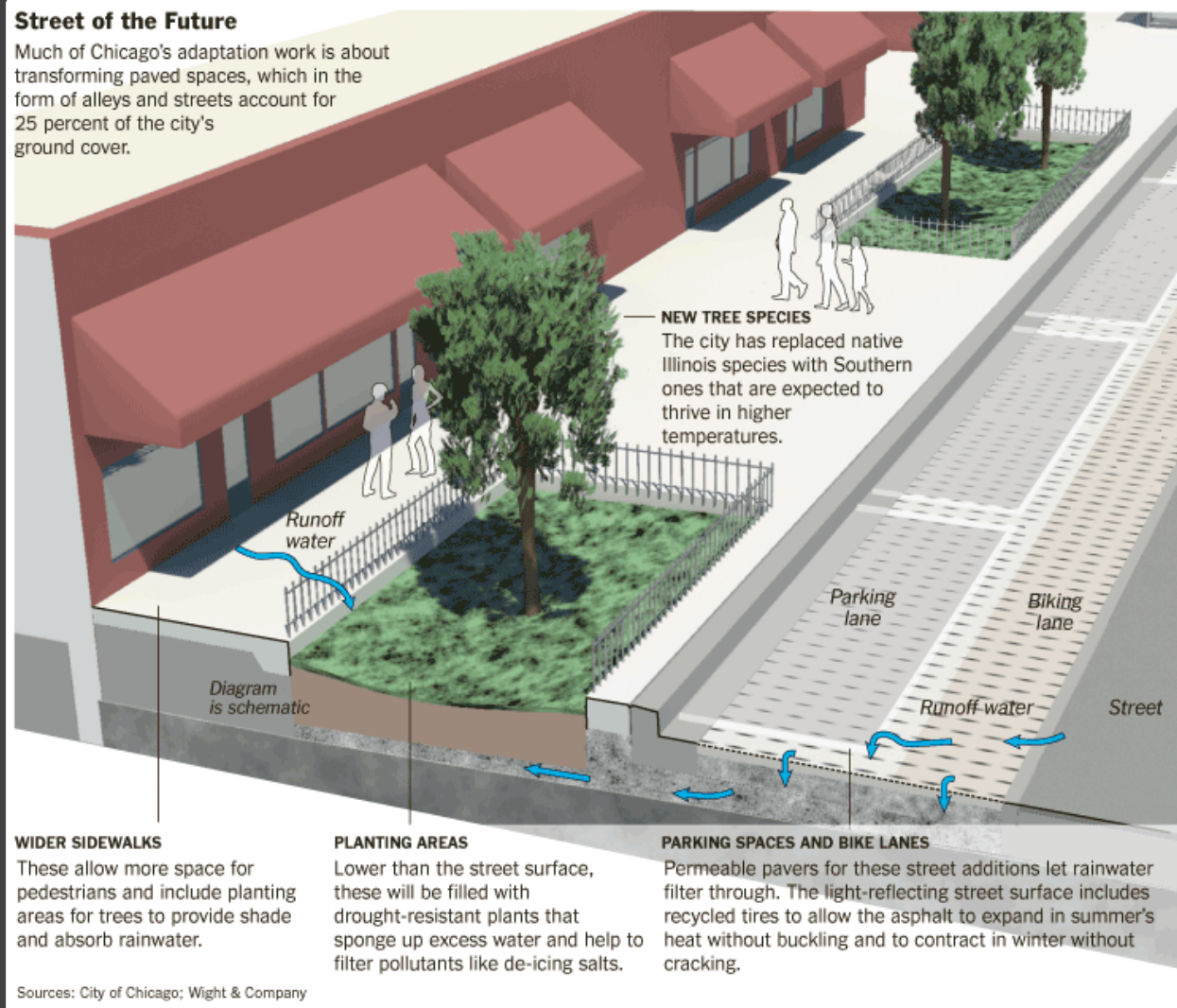


Coordination Across Agencies

- Coordinate construction across agencies
- Included needed CSO elements, including enhanced retention, within construction planned for other primary purposes



Integration of GI with Street Work



Integration of Community Facilities with Grey CSO Controls

Park Constructed over
CSO Vortex Facilities



Walk/Bike Path Constructed over
CSO storage/Conveyance Pipe



CSO Storage and Treatment

- Use existing infrastructure
- Effects
 - temporary storage of wet flow
 - Push more flow through treatment plant
- Benefits
 - Uses existing infrastructure
- Approaches
 - Treatment Plants
 - Secondary bypass
 - In-system storage
 - Raise regulator weirs
 - Bending weirs



Flooding and Resiliency

- Approaches
 - Sewer Separation
 - Stream daylighting
 - Green Infrastructure
 - Design Elevations
 - Sediment Controls



Developing Regional Solutions

LTCP development

- Public Participation
- Public Notification System
- Area-wide receiving waters characterization (monitoring)
- Water Quality Modeling
- System modeling – same platform, modeling parameters
- Update Cost/Performance control alternatives
- Financial Capability Analysis
- Green Infrastructure pilot programs, monitoring

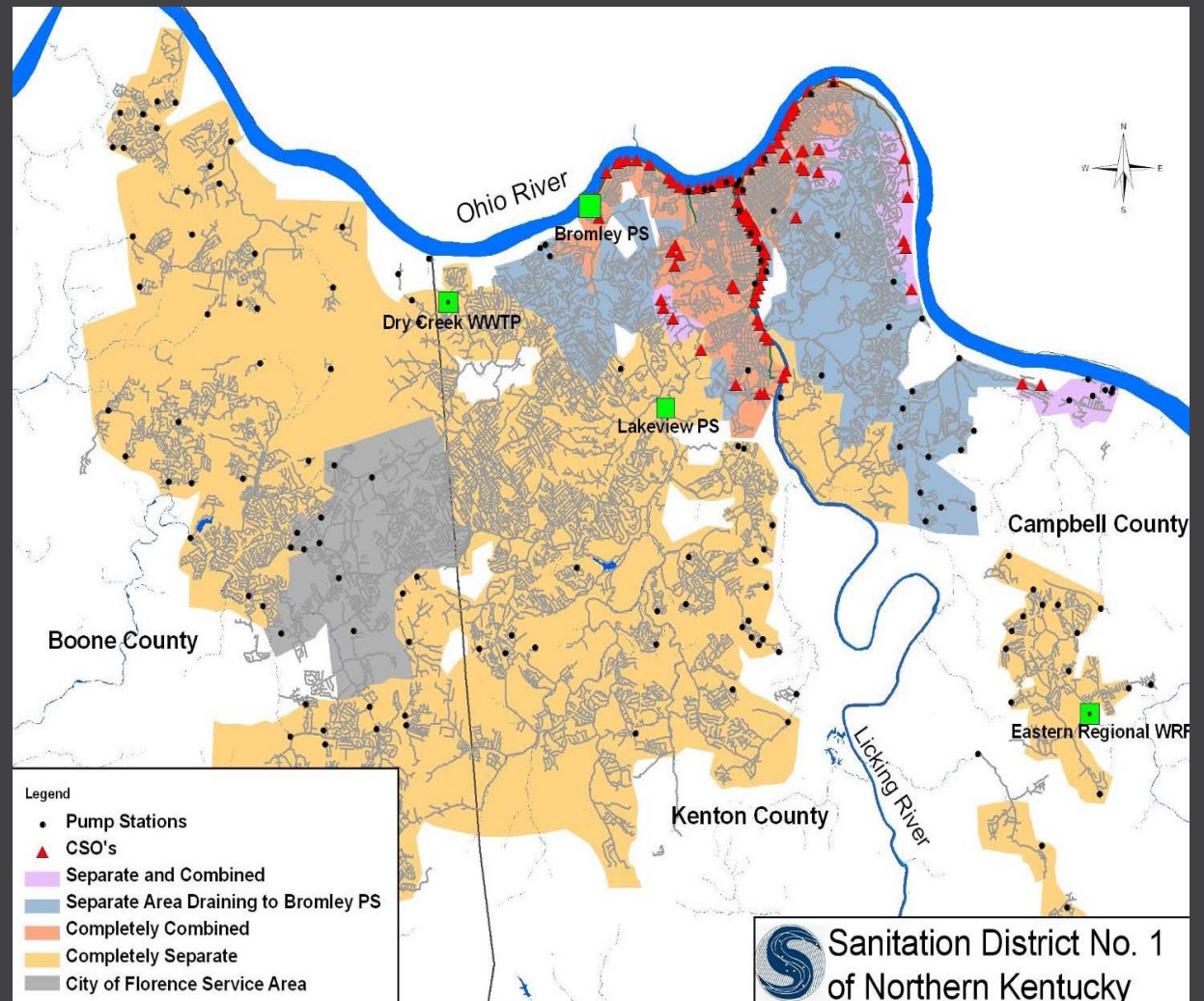
LTCP Implementation

- CSO Reduction Opportunities across municipal boundaries
- Maximize flow to local sewage treatment plant
- Consolidate secondary treatment
- Regional GI solutions



Case Study: N. Kentucky SD1

- 3 counties
- Total service area
~ 229 sq miles
- CSO area 12 sq miles
- >1,600 miles of
sewers
- 134 pump stations
- 3 regional treatment
facilities
- 102,000 Wastewater
Accounts
- 94,500 Storm Water
Accounts



Case Study: N. Kentucky SD1

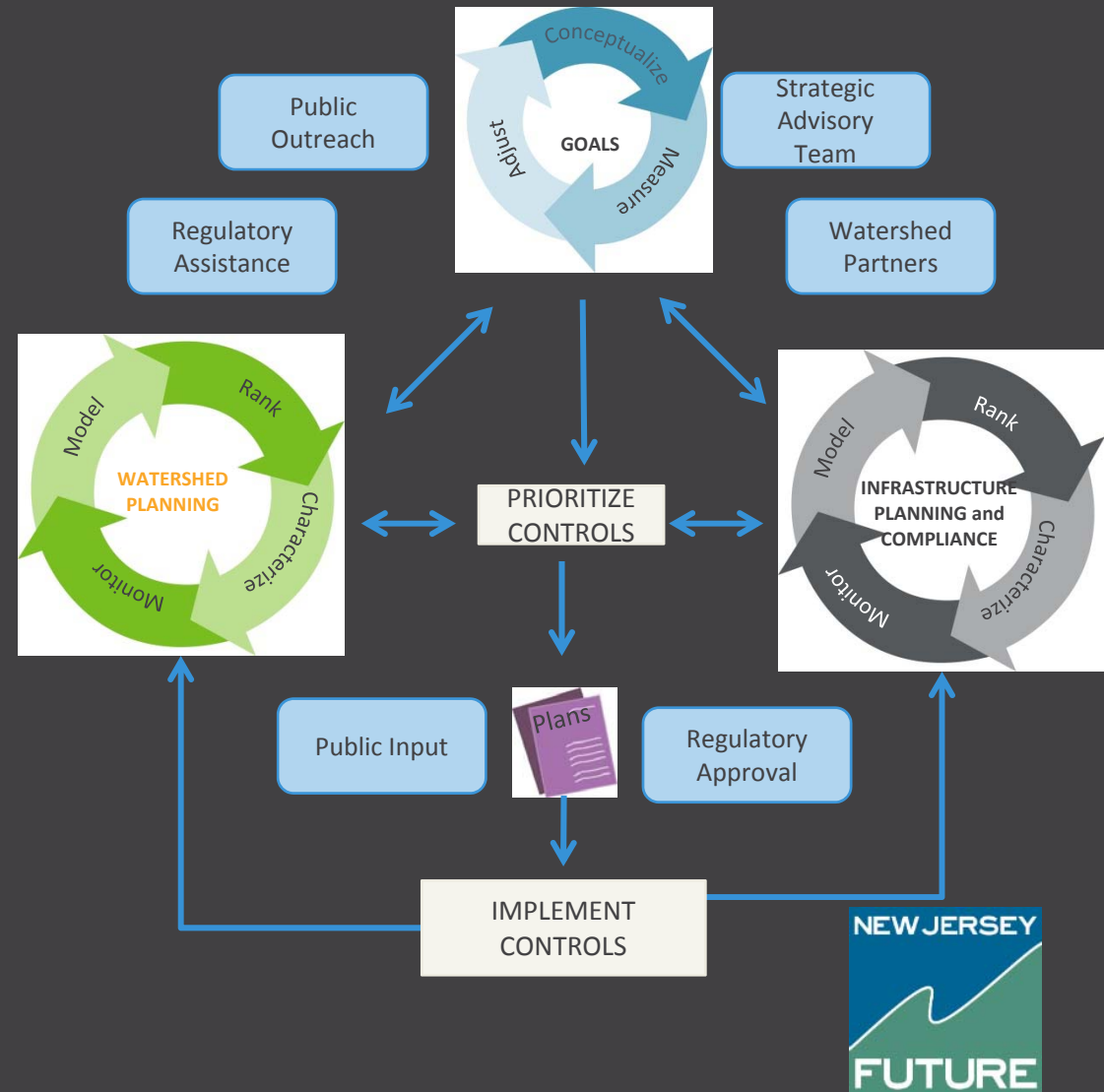
- Combined Sewer Overflows
 - 95 CSO locations
 - 1.8 billion gallons annually
- Sanitary Sewer Overflows
 - 166 SSO locations
 - 200 MG annually
- Storm Water Runoff (MS4 & NPS)
 - Flooding
 - Hydromodification
- Impaired Waters
 - Primary pollutants of concern (bacteria, solids and nutrients)



Case Study: N. Kentucky SD1

Planning Process

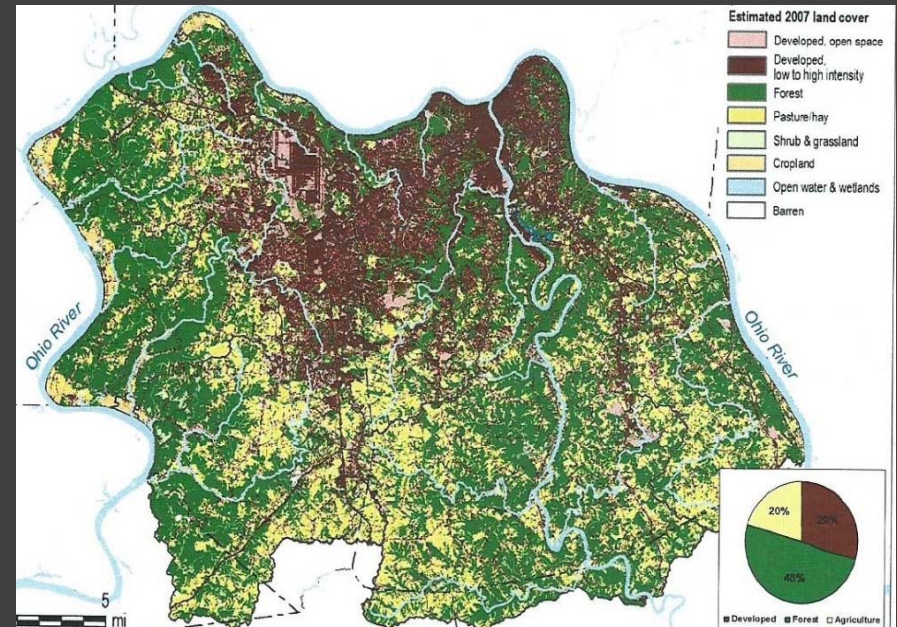
- Process to control highest regional priorities first
- Integrated approach to address wet and dry weather sources
- Additional benefits to the community such as air quality, wildlife habitat, urban beautification, and economic development
- Funding to projects that provide the greatest benefits
- Public input process to support financial investment



Case Study: N. Kentucky SD1

Solution

- Watershed-based approach
- Consider pollution sources beyond sewer overflows
- Iterative Assessment Process
- Consent Decree was entered in Federal Court on April 18, 2007
 - Requires SD1 to improve water quality, eliminate SSOs and comply with the CSO Policy by 2025
 - Watershed management approach allows SD1 to revise watershed plans every 5 years



Public Participation

Informational Meetings



Community Planting



Notification



Case study: Omaha, NE

- 10 Basin Advisory Panels
 - 83 neighborhood associations, utilities, local business, developers, and environmental groups.
- Citywide Community Basin Panel was appointed by the Mayor of Omaha to represent the concerns of the overall community.
- Evaluated alternatives, identified priorities for investment and communicated the financial impacts on ratepayers for implementation.
 - Standardized list of control alternatives -- a hybrid approach combining sewer separation, storage, and treatment – screened, presented to the advisory panels.
 - Criteria that included community enhancements, flood reduction, and water quality.
 - The advisory panels and community members ranked the criteria important to each basin.

