

Communities of the Future Advisory Committee

February 25, 2010

Agenda

- Welcome and Introductions
- Updates & Announcements (Tony Parrott)
- West Fork Watershed Source Control Solution
- Context for Sustainable Infrastructure - need for watershed approach to planning/stormwater solutions (MaryLynn Lodor)
- HUD Community Challenge Grant \$2.4M - Land Development Code (Margaret Wuerstle, City Planning)
- Policy Concepts for Integrated Stormwater Management (Todd Kinskey, Hamilton County Regional Planning)
- Break outs



Water Technology Innovation Cluster

Factor Conditions to Attract Businesses

Mobilizing Community & Business Leadership to Create Regional
Competitive Advantage

CFAC is modeled after this cluster principle

Our collective work can create numerous successes to **promote
economic growth and technological innovation.**

Water Technology Innovation Cluster



Objectives

- Develop, test, and commercialize technologies
- Attract the best and brightest scientists and entrepreneurs
- Promote economic development through the creation and attraction of jobs and investment
- Become the world's source for practical and affordable solutions and sustainable practices

Role MSD is playing major role in WTIC initiative:

Outcome #1: House Emerging Technological Business at Mill Creek Facility

Water Technology Innovation Cluster



Administrator Jackson, USEPA in Cincinnati January 18, 2011:



- *Protecting America's waters is one of EPA's top priorities...**innovative strategies and technology** to meet our nation's 21st century water needs.*
- *By bringing together public utilities, research partners, and innovative businesses, the Water Technology Innovation Cluster will be instrumental in strengthening health **protections for millions** of Americans and **promoting investments in cutting-edge technology**.*

Water Technology Innovation Cluster

Small Business Administration Administrator Karen Mills announcement in Cincinnati January 18, 2011:



- *...will benefit from the region's abundance of cutting-edge companies. Investments made here will encourage continued growth, while **positioning our nation to lead the way in a new market of environmental technologies.***
- *This public/private partnership will not only improve public health, but also help keep us competitive around the world by allowing small **businesses to invest in new ideas.***

Water Technology Innovation Cluster

Administrator Jackson Endorses Communities of the Future Advisory Committee work



- *...the Metropolitan Sewer District is currently evaluating potential green [sustainable] infrastructure projects in the Lick Run Watershed, an environmental justice community in Mill Creek Valley.*
- *One especially promising project in Lick Run will remove storm water flows from the combined sewer system and create a new above-ground stream with surrounding park land.*

MSD USEPA Region 5

Meeting with Regulators on LMCPR

January 25, 2011

Meeting with Regulators on LM CPR

January 25, 2011



Purpose to seek affirmation on:

- MSD Alternative Project
- Wet Weather Strategy
- Sustainable infrastructure
 - Integrated solution for urban wet weather needs
 - Highlight source control
- Prep for Alternative Submission December 2012

Meeting with Regulators on LMCPR

January 25, 2011

General outcomes:

- Validation of MSD's Wet Weather Strategy
- Validation of Potential Source Control Projects



Lick Run Value Engineering (VE) study

Lick Run Value Engineering Study

- Purpose
 - Seek outside, independent expert opinion about project approach, technical merit to achieve goals
 - Wet Weather Strategy – Strategic Separation
 - Lick Run in comparison to tunnel
 - Best practices within the industry by leading engineers
 - Recommend optimization or cost saving approaches

Lick Run Value Engineering Study

Value Engineering Team

Howard Greenfield – VE Lead (ARCADIS)	William Cesanek (Camp Dresser McKee)
Don Walker (AECOM)	John Aldrich (Camp Dresser McKee)
Kerry McWalter (AECOM)	Jeff Sharon (Brown & Caldwell)
Chris Yoder (MBI)	Larry Jaworski (Brown & Caldwell)

Lick Run Value Engineering Study

- VE Conclusions:
 - *The approach being taken to control wet weather combined sewer overflows in the Lick Run catchment area by ...appears to be sufficient to achieve the goal of reducing combined sewer overflows by 2 BG per year and meet the USEPA consent decree.*
 - *The stormwater capture predicted ...shows a reasonable percentage of stormwater capture. A review of the model reveals that its calibration with existing conditions is also reasonable, leading one to believe in the results of the model with the changes implemented.*

Lick Run Open House



Lick Run Open House

January 19, 2011

Lick Run Open House

January 19, 2011, 6:00 – 8:30 p.m.

Orion Academy, South Fairmount

- Over 180 attendees
- Eight information stations
- Interest for future planning workshops, anticipated for Summer 2011



West Fork Watershed Source Control

West Fork Watershed Source Control



December 2011 – CFAC Planning Exercise

West Fork Watershed Sustainable Infrastructure Planning

- Est. 954 MG entering combined system*
- Reduce sewage in basements*
- Reduce stormwater flooding*



Project Challenges

- Interaction between West Fork channel and West Fork interceptor
- Runoff from large areas of undeveloped land drain to the CSS
- Dry weather base flows from Mt. Airy Forest (>1,400 acres) enter CSS
- Structure flooding adjacent to channel
- Coordination of multiple efforts within watershed
 - CSO 125, 126, 127, 128, 130
 - Westwood Northern Bundle (CSOs 525, 195, 194)
 - RTC at CSO 125
 - FEMA grant for property buyout
 - Concrete risers around grates to reduce inflow

Dry Weather Condition: Downstream



September 2009

Wet Weather Condition: Small Rain Event



Wet Weather Condition: Large Rain Event

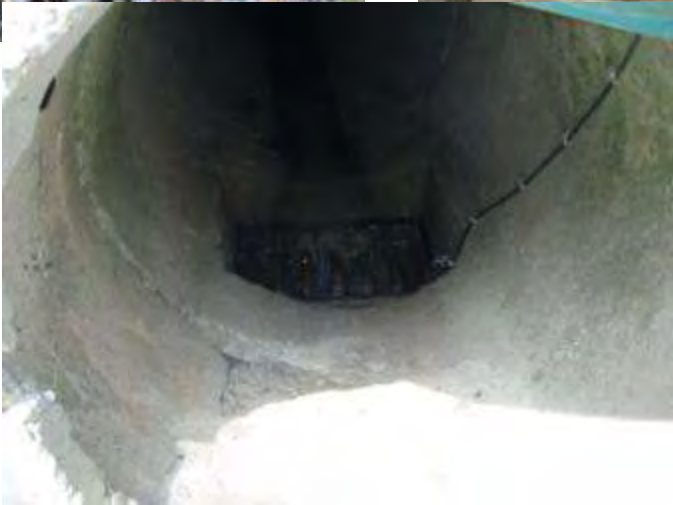


The West Fork Channel and Interceptor

Invert Grates Connect Channel to Interceptor

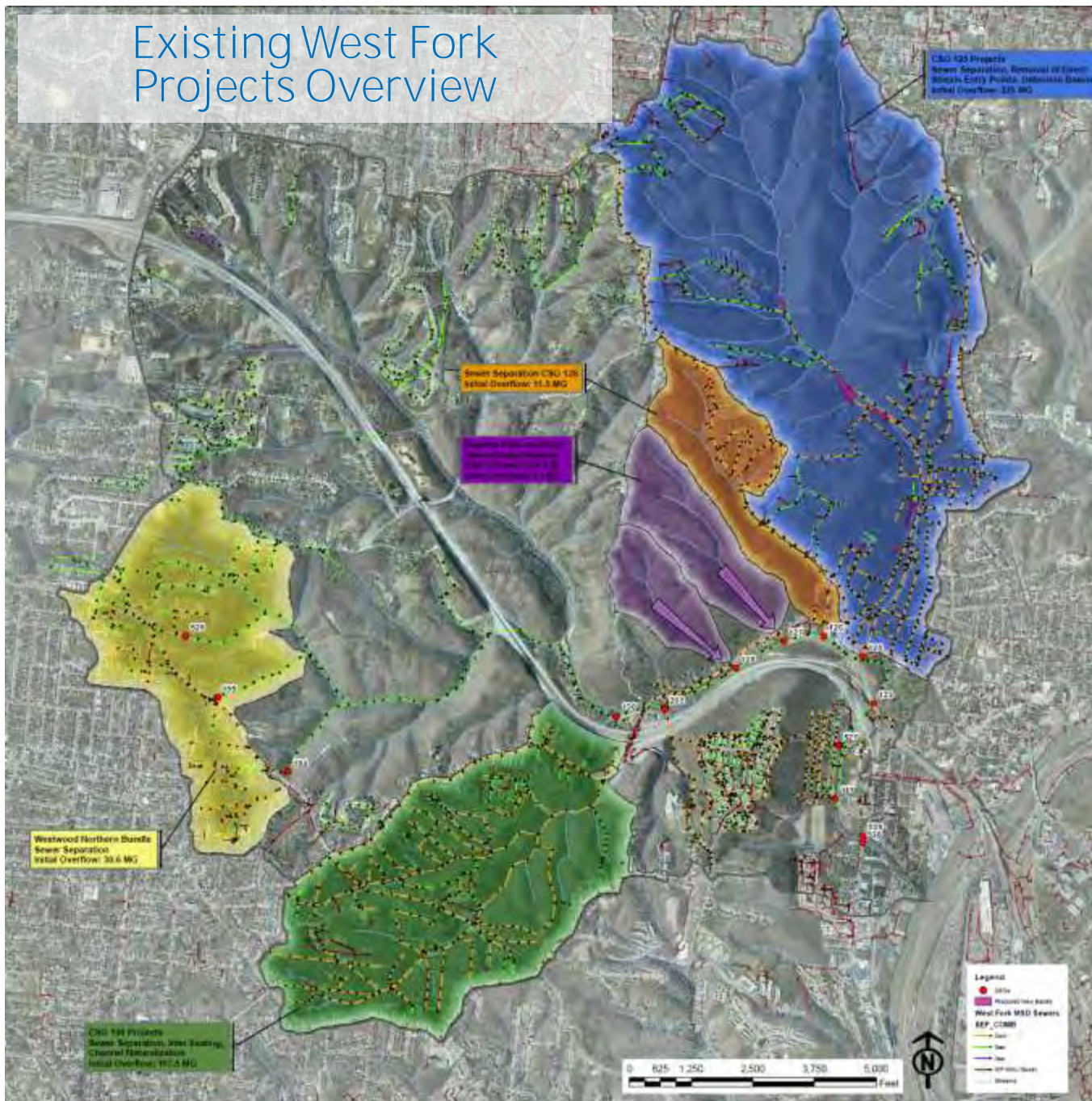


CSOs Discharge into Channel



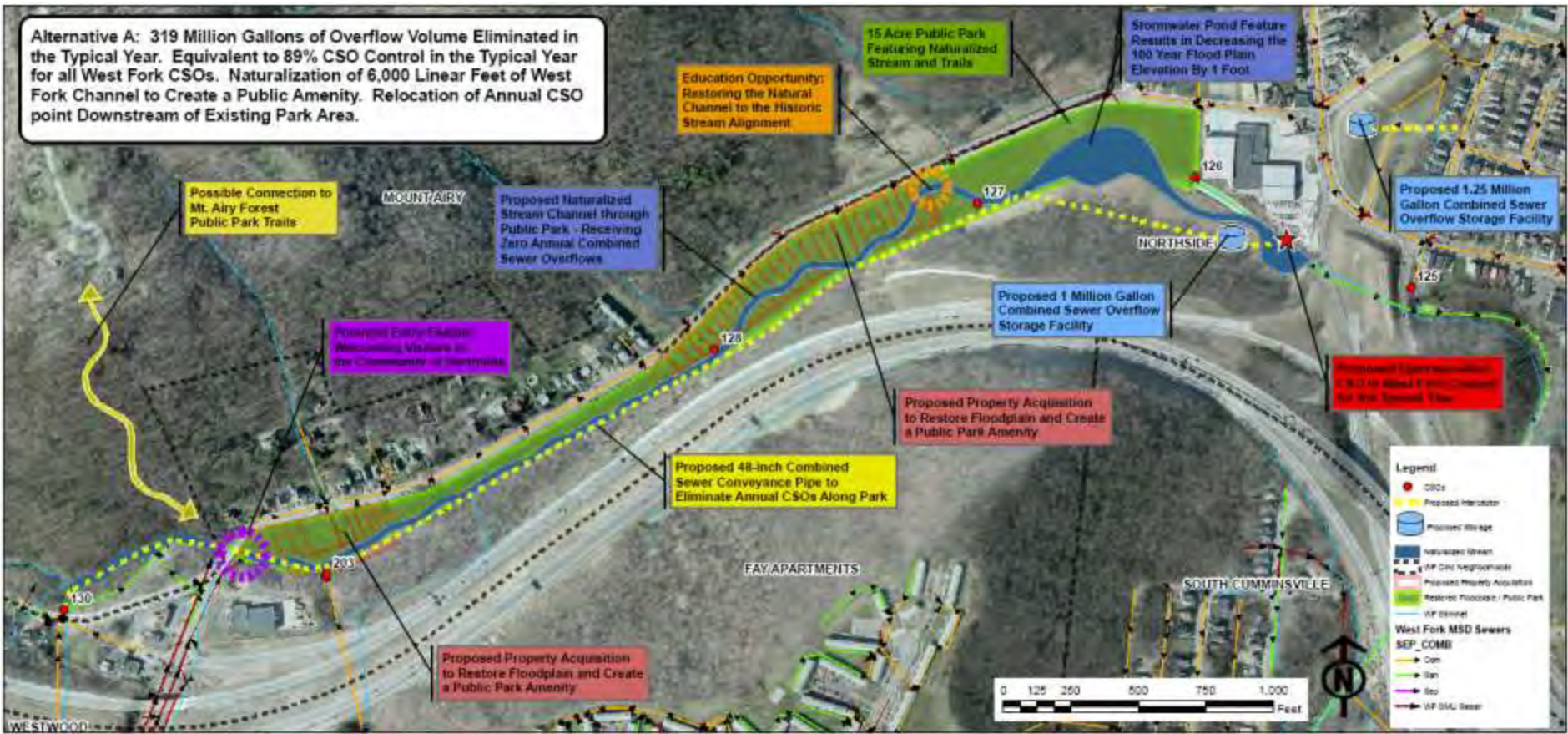
**Underflow Drains
Connect CSOs Directly
to Interceptor**

Existing West Fork Projects Overview

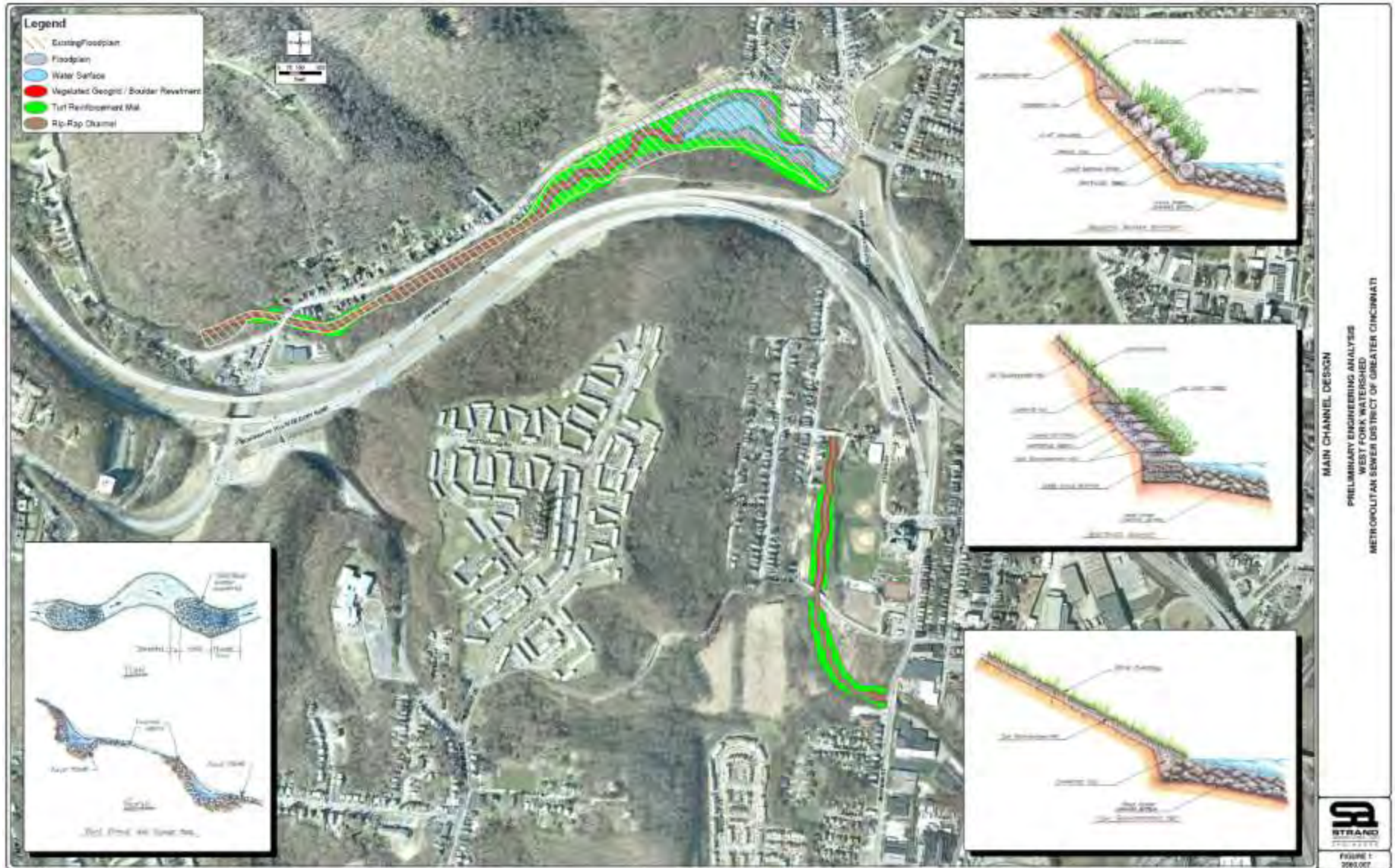


319 Million Gallons of Overflow Volume Eliminated in the Typical Year

Naturalization of 6,000 Linear Feet of West Fork Channel



Naturalization Concepts



FEMA Grant Awarded - \$3M

Strategic Separation Wet Weather Strategy

Addressing a key factor of success

The Hydrologic Cycle



Lower Mill Creek Watershed



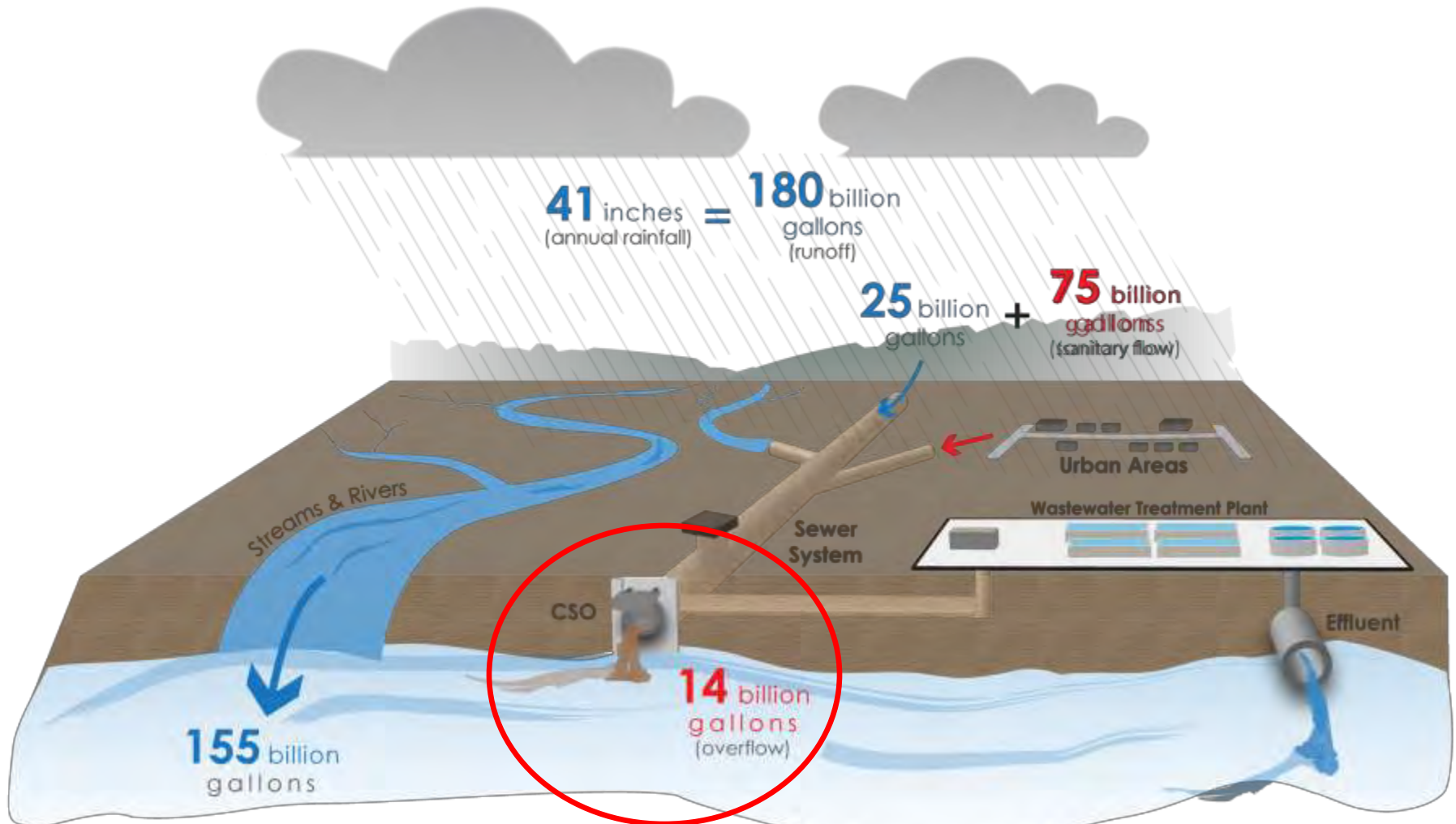
Natural System – closed system:
inputs are determined once and constant

Lower Mill Creek Watershed



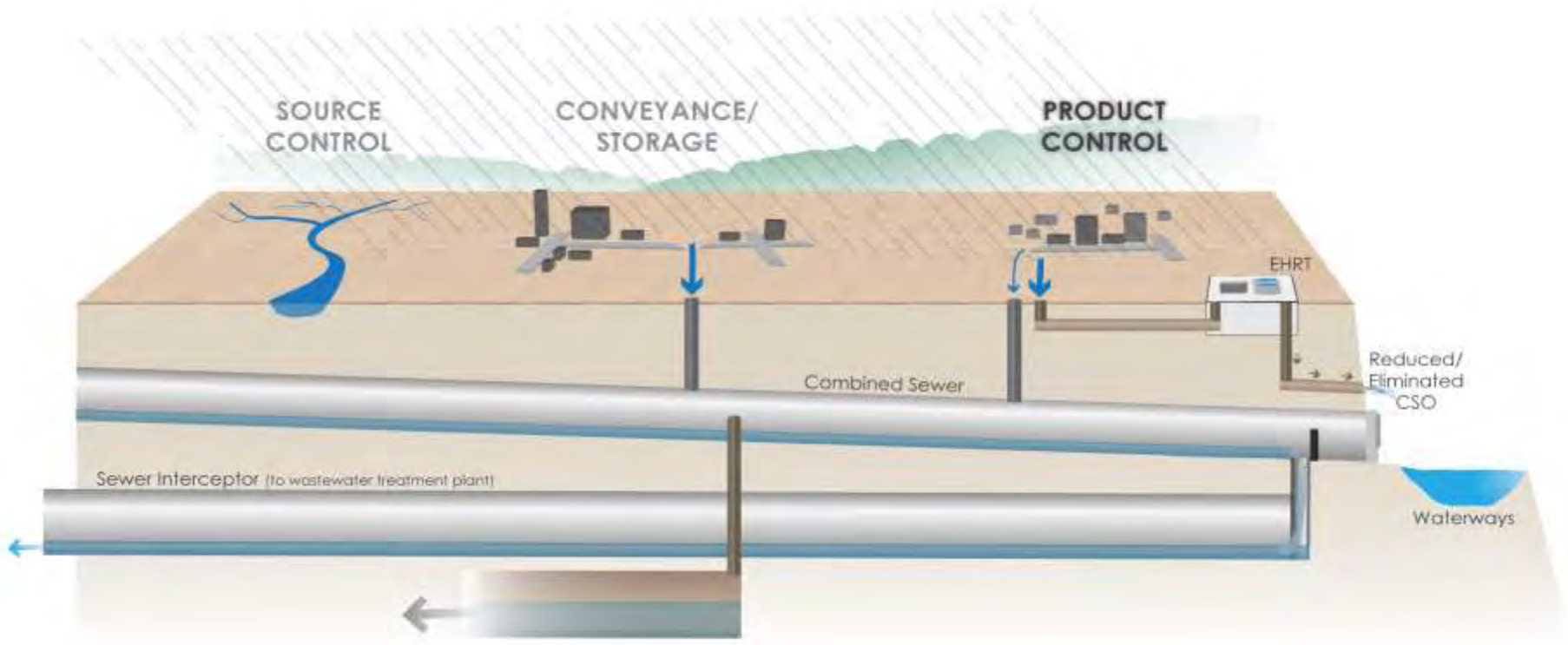
Built Environment – open system:
areas and components strongly influenced by humans

MSD Current Environmental Challenge



MSD is among the Top 5 CSO dischargers in the US

MSD's Wet Weather Strategy



Hydraulic Grade Line →
inside sewer



Wet Weather Strategy

- Designed to support watershed water balance
- Pursues a strategic approach to sewer separation
 - **priority areas** represent cost-effective flow separation
 - sizing of proposed storm infrastructure
 - **non-priority areas** assumed to have adequate combined flow capacity
 - stormwater runoff from these areas into the priority areas (through natural runoff) will be negligible.

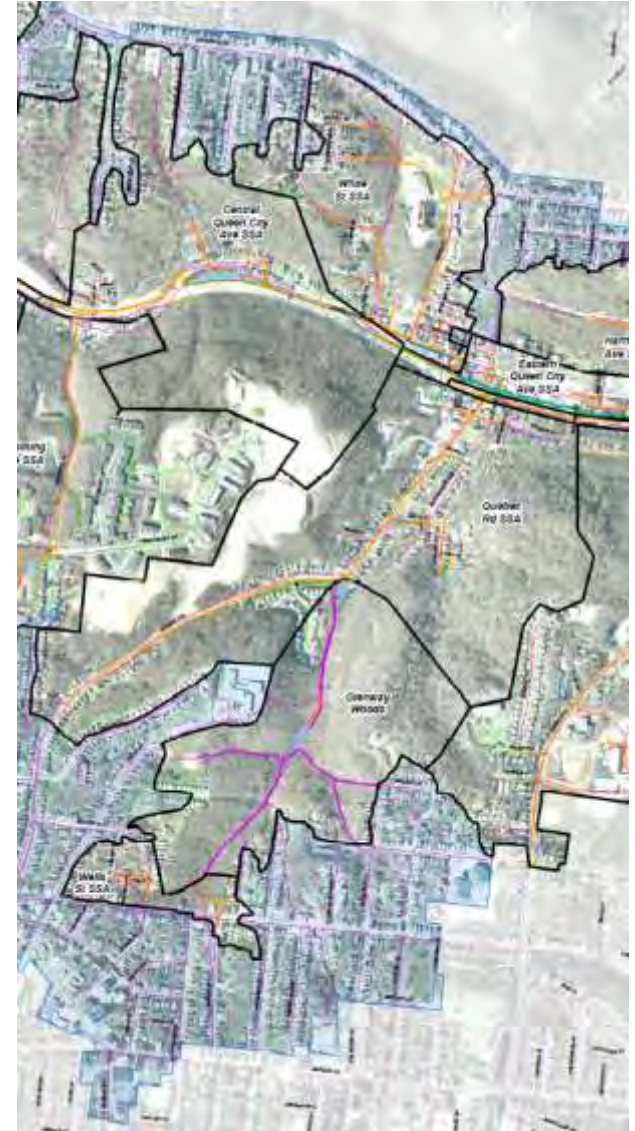
Lick Run Wet Weather Strategy



Future Planning for Strategic Approach

For Example:

- The proposed stormwater infrastructure was sized to convey the priority area flow only.
 - Priority Area = 181 cfs
- If the non-priority area was connected to the proposed stormwater system, the flow to convey would increase significantly, along with the sizing of the proposed infrastructure.
 - Total Drainage Area = 290 cfs



Planning considerations Strategic Separation

- Estimated flow from the non-priority area and interaction with the proposed storm system
 - Asset/infrastructure management in the non-priority areas
 - Watershed or site-specific development practices
 - City and Regional Planning: watershed zoning throughout the watershed but particularly in non-priority areas

Todd Kinskey

Margaret Wuerstle

- HCRPC and City Planning
- Breakout Groups
 - Inform and Influence
 - Economic Development
 - Policy and Integration

Breaking Down Silos

Municipal Policy Concepts for Integrated Stormwater Management



HAMILTON COUNTY

Regional Planning Commission

Policy Concepts

- Low Impact Development
- Light Imprint
- Transfer of Development Rights
- Green Streets
- LEED-ND

Low Impact Development

Description: development strategy that emphasizes managing stormwater by using on-site design techniques and Best Management Practices.

Low Impact Development

Limitations of Stormwater Codes based on LID:

- Stormwater Regulations that are based on LID can be restrictive for compact urban development
- Regulations based on LID focuses on high-tech solutions and often low-tech solutions are against code.
- Regulations mandating detention/retention areas in front or on side of buildings can be prohibitive in urban areas to good pedestrian streetscape design

Light Imprint

Based on Light Imprint Handbook by Thomas Low from Duany Plater-Zyberk & Company

Description: Toolbox for integrating stormwater Best Management Practices with the urban to rural transect

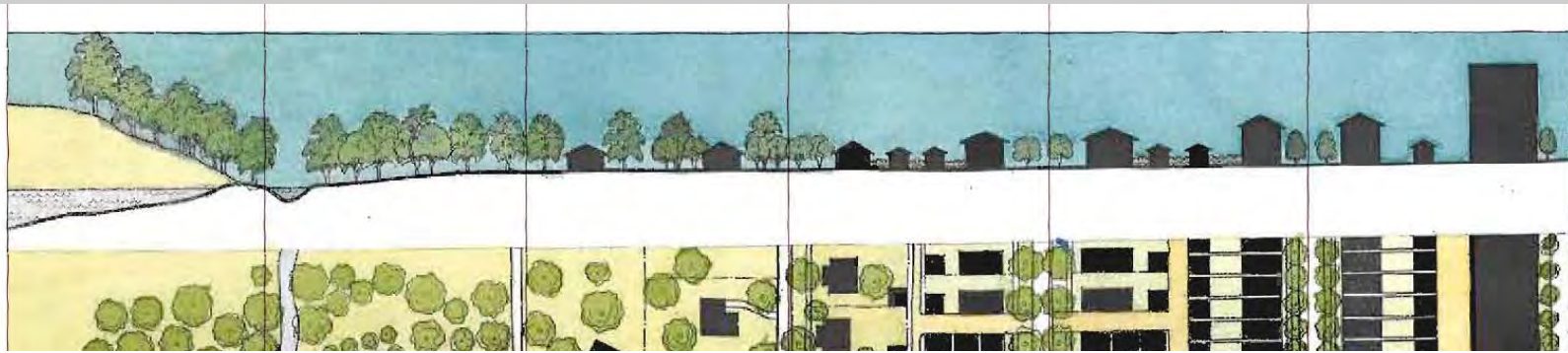
Emphasizes

- compact, walkable neighborhoods and “shared” watershed-based stormwater solutions
- vs. conventional suburban development and site-based stormwater solutions
- low-tech stormwater solutions over more expensive high-tech solutions

The Transect

TOOL BOX MATRIX





VISION 1.3

CHANNELING

NATURAL CREEK				
TERRACING				
VEGETATIVE SWALE				

FILTRATION

WETLAND/SWAMP				
FILTRATION POND				

PAVING

COMPACTED EARTH				
WOOD PLANKS				
STABILIZATION MAT				
CRUSHED STONE/GRAVEL/SHELL				

LIGHT IMF

STORAGE

IRRIGATION POND			
RETENTION BASIN W/ SLOPING BANK			
RETENTION BASIN WITH FENCE			
RETENTION HOLLOW			
DETENTION POND			
DRY WELL			
FLOWING PARK			
RETENTION POND			
LANDSCAPED TREE WELL			
POOL/FOUNTAIN			
UNDERGROUND VAULT/PIPE/CISTERN			
GRATED TREE WELL			
PAVED BASIN			

XIV. Gutter/Curb

T-Zones:	T3, T4, T5, T6	Slope:	Steep, Moderate, Flat
Cost:	\$	Soils:	Poor, Medium, Good
Maintenance:	Low	Climate:	Cold, Temperate, Hot Dry, Moderately Wet, Wet

A. Description

Gutters and curbs come in many forms and are used to channel water from roadways, roofs, and ground planes. Gutters and curbs are made of many materials depending on their use. They often appear in the form of an open trough.

B. Use

Gutters can be used to beautifully transport water through a landscape. They are more utilitarian when used along street edges with curbs. They typically are better used in urban zones of the transect. There the gutters combined with curbed streets lend a more formal aesthetic.

Stone troughs are used on the ground plane under some roof eaves as a substitute for gutters hung at the roof edge. The trough gutters prevent erosion and transport the water to underground cisterns.

C. Cost

Gutters and curbs are inexpensive because they are simple techniques. Material is the main factor in determining the cost.

D. Maintenance

Gutters and curbs are low maintenance. Debris needs to be removed regularly to ensure functionality.

E. Resources

Herbert Dreiseitl and Dieter Grau. *New Waterscapes: Planning, Building and Designing with Water*. Boston: Birkhauser, 2001. 108.

CHANNELLING

Gutter/Curb

T3
SUB-URBAN

T4
GENERAL
URBAN

T5
URBAN
CENTER

T6
URBAN
CORE

CHANNELLING

Gutter/Curb

T3
SUB-URBAN

T4
GENERAL
URBAN

T5
URBAN
CENTER

T6
URBAN
CORE



T3 - Gutter - Monteagle, TN



T3 - Gutter and Curb - Monteagle, TN

Griffin Park, Greenville County, SC

- Compared Light Imprint with conventional engineering methods on 42 acre lot
- *The Light Imprint Model concluded to be a better design and had a 50% storm water cost savings.*

Relevance

- Cincinnati's Land Development Codes and Form-Based Codes offer opportunity
- Light Imprint framework could be adjusted to local conditions
- Tailor quantitative stormwater regulations for each zone of the Transect

Transfer of Development Rights

HUD Community Challenge Grant Application
recommended that the Unified Land Development
Code incorporate Transfer Development Rights

Description: A zoning privilege for the development of one parcel of land that can be transferred to a different parcel of land. Most often this involves shifting potential development from agricultural or environmentally sensitive land to areas nearer to municipal services.

Transfer of Development Rights

Impervious Cap & Trade

New concept proposed for New Jersey

- Limit total impervious in remaining open land to justify limits
- Encourage redevelopment of urban areas by exempting from impervious limits
- Reward redevelopment proposals that demonstrate Smart Growth & LEED-ND Standards

Transfer of Development Rights

Lot-based Stormwater Treatment

Requirement could facilitate increased density

- But only if offsite mitigation could be purchased
- This could be done through construction of wetland and/or other neighborhood or district scale BMP's

Relevance

- Possible Implementation through Mill Creek Corridor Plan as proposed in HUD Community Challenge Grant

Green Streets

Description: A street that uses vegetated facilities to manage stormwater at the source.



Green Streets – From Pilots to Policy

Portland's Green Streets Team

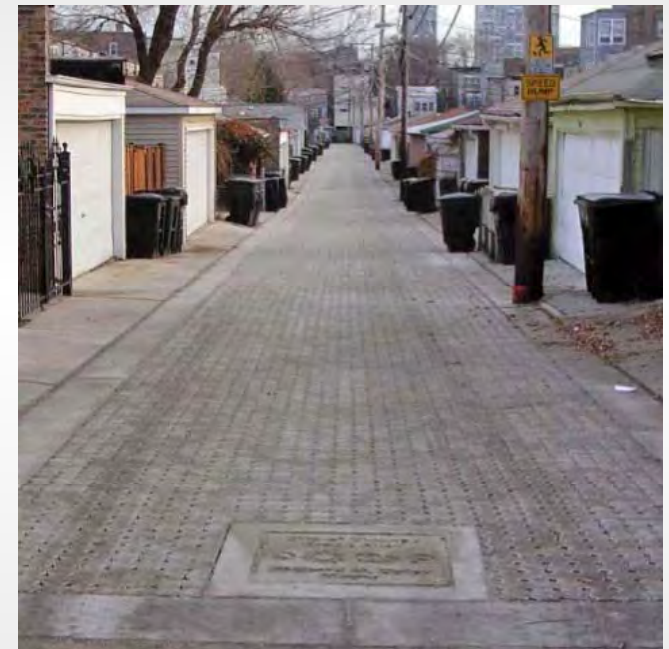
- Propelled Portland's early green street pilot projects into a comprehensive, citywide, multi-bureau program.
- In 2007, Portland approved a Green Street resolution, report and policy to incorporate the use of green street facilities in public and private development.



Green Streets – From Pilots to Policy

Chicago's Green Alleys

- Started as one year pilot program to retrofit a small number of alleys with pervious materials
- Allowed CDOT to develop standards for permeable alley surface materials, which has in effect **created a new market for manufacturers and installers.**
- CDOT now retrofits all alleys with permeable materials



Cincinnati's Green Streets

Green Streets Pilot Project Study (2007)

- Collaborative effort between MSDGC, Cincinnati Parks, Stormwater Management Utility (SMU) and Cincinnati DOTE
- \$50,000 set aside to evaluate feasibility of four separate green infrastructure projects targeted along four downtown streets
- Pilots to Policy – Next Steps?

Relevance

- 1) Is there an opportunity in Cincinnati to transition from a Green Street Pilot Program to a Green Street Policy?
- 2) Opportunity for integrating the Green Street toolbox (stormwater) and the Complete Street toolbox (walkability) into one holistic transportation policy?

LEED-ND

US Green Building Coalition's "Leadership in Energy and Environmental Design" for Neighborhood Development

Description: Uses a system similar to the now-familiar "Green Building" standards to encourage building more livable, environmentally-responsible larger-scale projects

LEED-ND

Uses

Incentive

- Projects that achieve LEED-ND certification could receive tax, sewer, other benefits

Regulation

- Set of regulations could be codified to follow LEED-ND specifications

LEED-ND

Issues

BMPs in urban areas typically single-site

- LEED-ND encourages shared solutions for parking, landscaping, parks, etc., in master plan

Rainwater Management Credit currently under review

- Currently encourages lower-density & works against other LEED-ND goals
- Revised credit would work over spectrum of context, from urban to rural

Relevance

- HUD Community Challenge Grant included LEED-ND
- Could be included in neighborhood designs for Lick Run area
- Could build a framework of common stormwater practices across the Lick Run area



Cincinnati Land Development Code

February 25, 2011



Livability Principles

- Provide **more** transportation choices
- Promote **equitable, affordable** housing
- Enhance **economic competitiveness**
- Support **existing** communities
- Coordinate **policies** and leverage **investment**
- Value **communities** and **neighborhoods**

HUD/DOT Community Challenge Planning Grant

Office of Sustainable Communities (HUD/DOT/EPA):

- Gap funding for activities that support the 6 Livability Principles
- Cincinnati application: Land Development Code (LDC) and streamlined permitting process, including planning activities for three demonstration projects

City of Cincinnati Grant Award

- Cincinnati awarded \$2.4 million (over 3 years)
- \$68 million total awarded by HUD and DOT through the Office of Sustainable Communities
- Cincinnati received the 4th Largest award overall

LDC Partnership

- **Metropolitan Sewer District**
- **Mill Creek Restoration Project**
- **Health Department**
- **CAGIS**

LDC Objectives

- **Meet Livability Principles and Plan Cincinnati goals**
- **Expand tool box:**
 - **Consolidate existing zoning and subdivision regulations and building and environmental codes**
 - **Create new community oriented regulations that allow for development that promotes social, economic, and environmental benefits**
 - **Streamline processes and procedures for review and approval of development and improvement projects – without excluding the public review process**

Existing Development Tools

- **Zoning Regulations**
 - Variances
 - Special Exceptions
 - Conditional Uses
 - Urban Design Districts
 - Historic Preservation Guidelines
 - Planned Development Districts
 - Hillside Overlays
- **Subdivision Regulations**
- **Building Code Regulations**

Project Tools - LDC

- **Consolidate Development Regulations**
- **Form-Based Codes**
- **Inclusionary Zoning**
- **Incentive Zoning**
- **Transit-Oriented Development**
- **Complete Streets**
- **Transfer of Development Rights**
- **CPTED**
- **Site Plan review/Streamlined permitting process**

Demonstration Activities

- Lick Run Watershed Master Plan and Lower Mill Creek Watershed Master Plan (in partnership with MSD)
 - *Form-Based Code, LEED-ND, Incentive Zoning*
- Mill Creek Corridor Plan (in partnership with Mill Creek Restoration Project)
 - *Transfer of Development Rights*
- Streetcar/Transit Project
 - *TOD and Inclusionary Zoning*

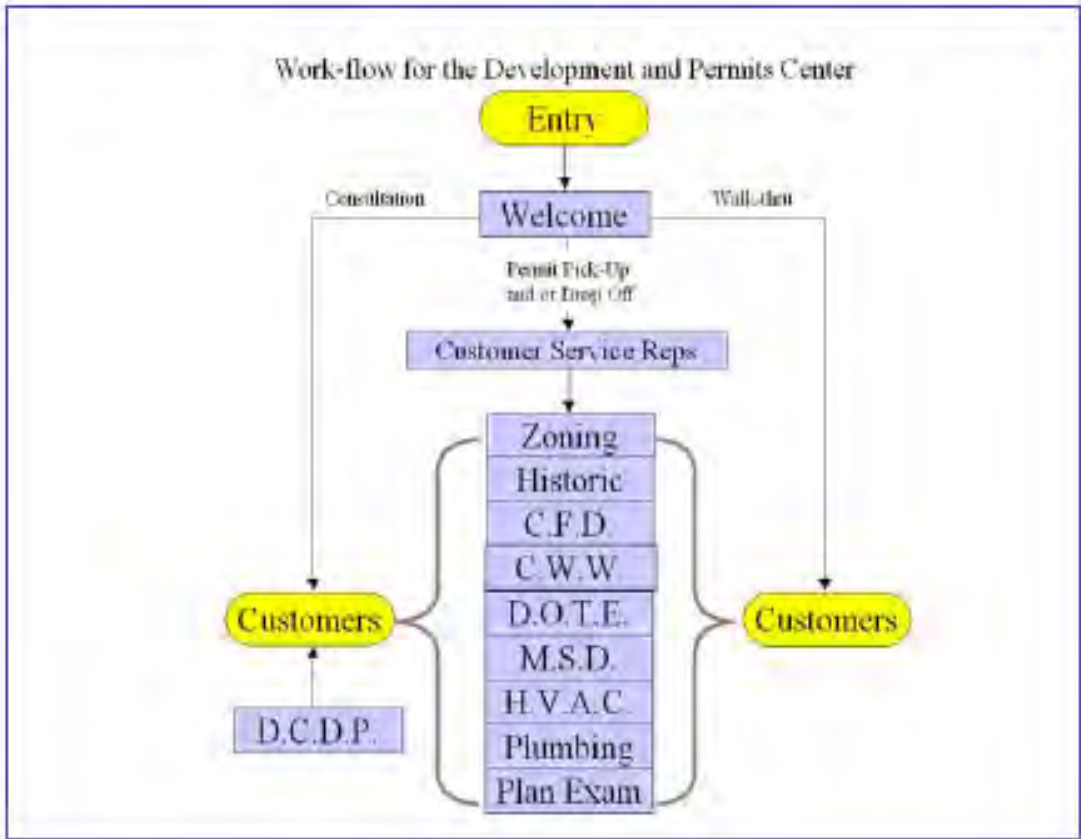
LDC Consultant Team

- Jacobs (Cincinnati)
- Code Studio (Texas)
- Glaserworks (Cincinnati)
- Hall Planning & Engineering (Florida)
- Opticos Design (California)
- White & Smith Planning + Law (Missouri)
- Wise Economy Workshop (Cincinnati)
- Zucker Systems (California)

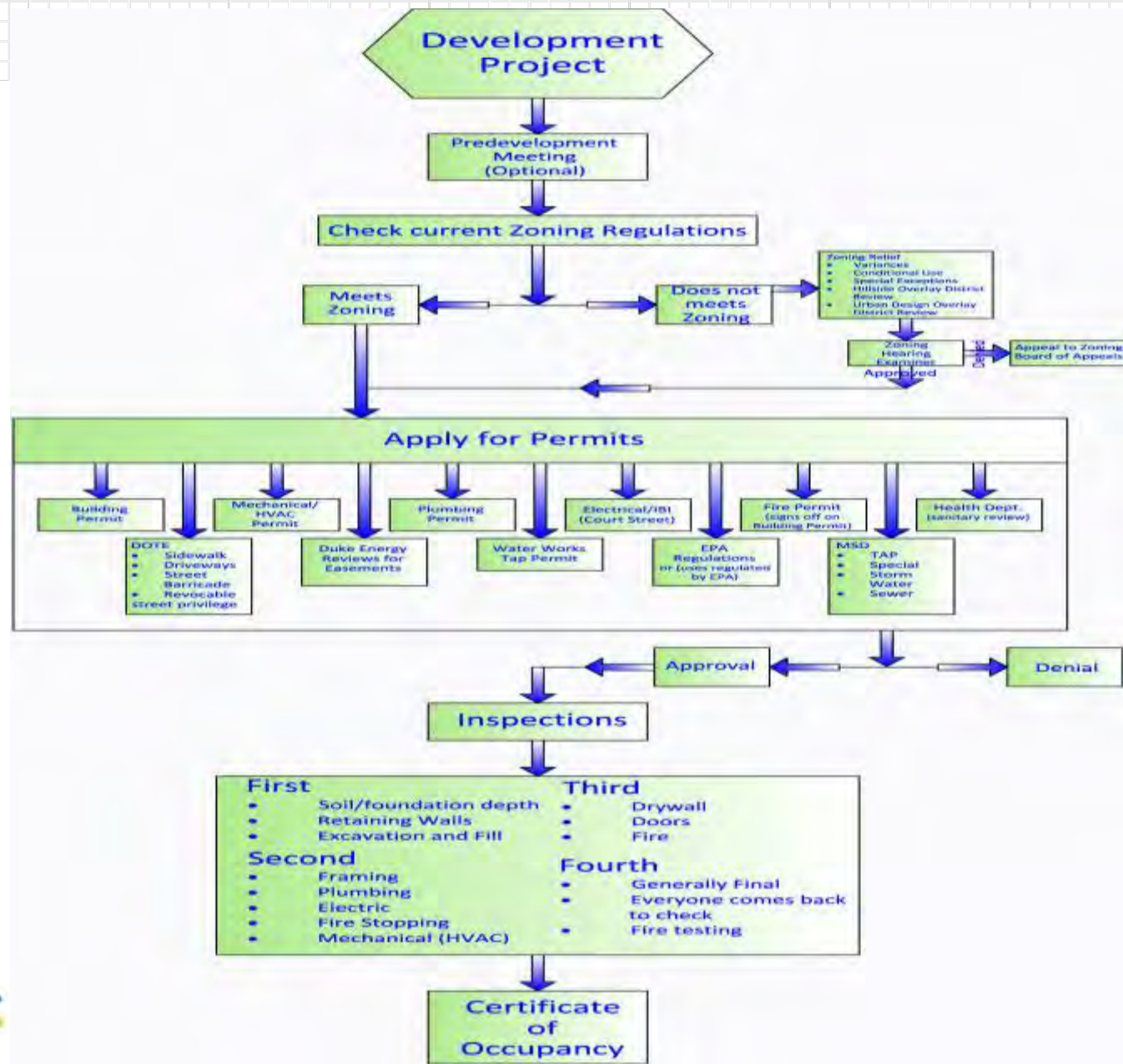
Project Tools - LDC

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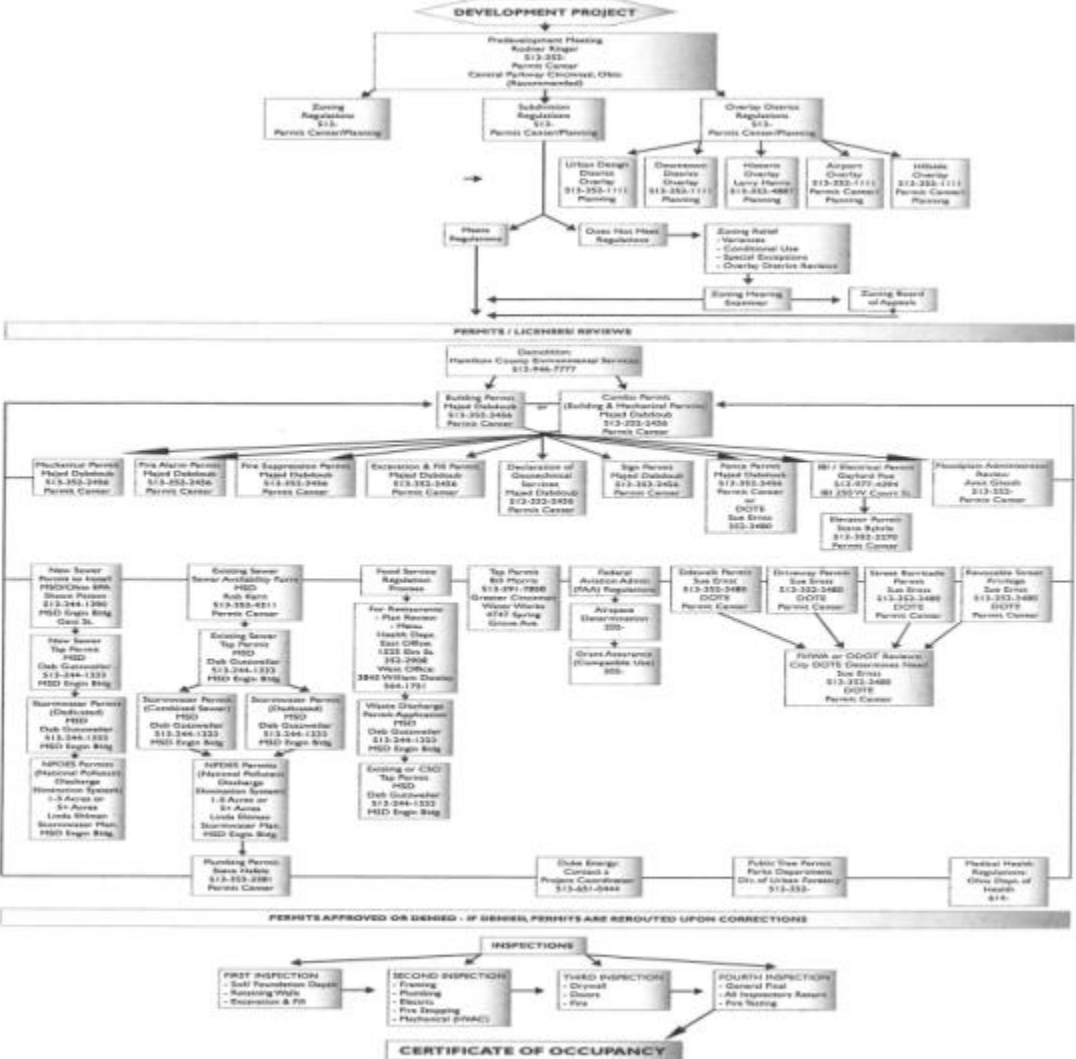
Existing Workflow



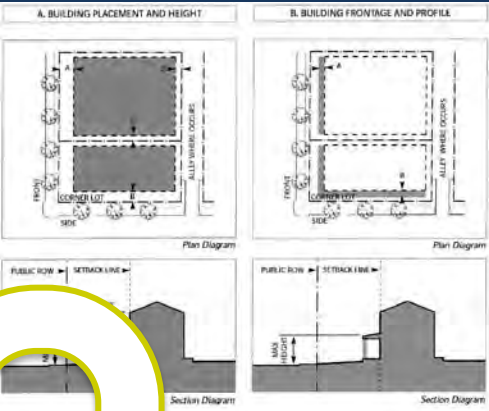
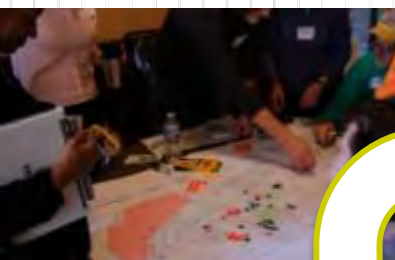
Existing Workflow



Existing Workflow

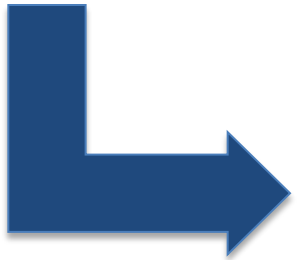


Form-Based Code



- Focuses on form of built environment rather than use
- Preserve, enhance, or transform community character
- Resulting regulations are based on stakeholder consensus vision

Improved Workflow - FBC



Simple Process Diagram

Step	Instructions	Code Article
1	Find zone for your parcel	12 Zoning Map
2	Comply with all <i>applicable</i> standards in General to All	2 General to All
3	Comply with standards specific to your zone	3 Specific to Zones
4	Comply with standards general to all zones	4 General to Zones
5	Follow the procedures and comply with requirements for permit application	9 Permit Procedures and Nonconforming Provisions

Inclusionary Zoning

Tool to increase affordable housing opportunities

- Can be mandated or encouraged
- Built as part of market rate housing
- Used in communities to provide workforce housing
 - 60 – 120% of Area Median Income or \$41,520 - \$83,040 in Cincinnati in 2008



Cincinnati - West End

Incentive Zoning

- Tool that provides property owners with benefit for providing defined community amenities
- Property owner benefit is typically density
- Benefit can be provided in exchange for plazas, courtyards, green space, LEED, workforce housing



Mixed-Use Development, Net-Zero Energy



Euclid Avenue, Cleveland

Transit-Oriented Development (TOD)

- Tool to maximize use of land surrounding transit routes
- Designed to reduce auto dependency
 - Walking, biking, or transit options to amenities like housing, jobs, and entertainment
- Moderate and high-density housing, along with concentrated mixed-use developments at strategic points



Complete Streets

- Policy that guides transportation improvements
- Plan, design, and construct improvements to encourage walking, bicycling and transit use while promoting operations for all users



Transfer of Development Rights (TDR)

- Program to mitigate the economic impact of land use regulation
- Property owners with low intensity zoning have the option of selling their development rights
- Property owners can buy these development rights to develop their property at a higher intensity



CPTED



Crime Prevention Through Environmental Design Principles:

- Access control
- Surveillance
- Territorial reinforcement

Consultant Team Next Steps

First Quarter 2012

- Code Diagnostic
- Assess existing regulations and plan policies
- Strategic Framework for LDC
- White Papers for New Tools
- Stakeholder Interviews
- Form Based Code Pre-Charrette Visit (March 6th)
- Permitting Process Review

Staff Next Steps

First Quarter 2012

- Annual Report for HUD
 - Work to date (December 31, 2011)
- Work Plan for 2012
- Convene LDC Advisory Committee
- Review Code Diagnostic and white papers and report back to City Council

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ideas in action



Charles Graves | Department Director
Cameron Ross, LEED AP | Project Manager

City of Cincinnati | Land Development Code
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513-352-4891 | 513-352-4888

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