Outline

• Background

• Floatables and Sediment BMP Pilot Study

• Stormwater Fee Credit to Promote LID

• Conclusions

• Next Steps
Stormwater Program Funding

- Stormwater Utility established in 2006 after severe flooding
- Budget
  - 2006 $7.6 M
  - 2012 $31 M
- Funding
  - Fees charged to developed properties (impervious cover)
  - Credit System to reward BMPs
- CIP - $40M/yr currently
- Water Quality not major driver
Background

Stormwater Management Challenges:

- 35” of annual precipitation
- Flash floods and long periods of drought
- Undersized pipes
- Aging Infrastructure
Background

Where are we?

• 2006 Design Manual (iSWM)
• 2010 Storm water Credit Fee Program
• 2011 MS4 Permit – Floatables control/monitoring required
• 2011 Floatables controls at every outfall to Trinity River - Required

Where are we going?

• Require WQ and LID consideration in engineering design and flood control projects

How are we getting there?

• Flotables and Sediment BMP Pilot Study
• Stormwater Fee Program to promote LID
Floatables and Sediment
BMP Pilot Study
Pilot Study Objectives

General
Identify practical methods for minimizing floatables and sediment to respond to the regulatory requirements

Specific
• Efficiency AND Feasibility (O&M) → testing BMPs at small scale
• Reduction of Lateral Blockages
• Proactive vs. Reactive maintenance
• Public Education

* 2-year pilot study (1.5 years complete)
Pilot Study Methodology and Procedures

• Site and BMP selection
• Inspection
• Maintenance
• Trash Characterization
• Sediment Analysis
• Documentation
BMP Selection Criteria

- Effective for removing debris and floatables
- Inexpensive and easy to install (retrofitting-friendly)
- Easy to maintain using existing equipment and procedures
- Not subject to frequent repair
- Flood protection
Automatic Retractable Screen (ARS)

Connector Pipe Screen (CPS)

Beginning-of-Pipe BMPs
Pilot Study Areas

- **Downtown** - High traffic area - Sweeping program - CPS/ARS
- **Lake Worth** – Sediment issues – CPS with silt plate
- **Lake Como** - Residential/Commercial- CPS only
- **John Peter Smith Hospital** – High traffic area- CPS only
- **Paschal High School** – Student program- CPS/ARS
Results and Observations

CPS

• High sediment and debris removal
• Some flushing at undersized inlets with no ARS coverage
• Cleaning needed generally once to twice in the 18 month period → acceptable

ARS

• Debris retained during dry events and minor rains
• Ease of cleaning during dry periods
Results and Observations

O&M – Sweeping program impacts

- Areas with sweeping programs generated only 26% of the total trash collected
- Low levels of trash within the inlets and low flushing Downtown and Paschal HS
- Combined sweeping and ARS decrease the frequency of cleaning requirements and flushing
Results and Observations

Trash Characterization Results
• 34 inlets 128-acre
• 6.7 lbs/acre-month and 0.2 ft³/acre-month are being removed
• Major constituent removed is sediment
Results and Observations
Sediment Analysis

METALS, TPH, PAH
- Levels were one to two order of magnitude smaller than the Protective Concentration Levels (PCLs) under TRRP

PCBs
- Levels in aged urban areas are higher than PCL
- Three orders of magnitude higher than concentration reported in the West Fork of Trinity

NUTRIENTS
- CPS is capturing sediment containing high nutrient levels
Stormwater Fee Credit to Promote LID
Water Quality & Sustainable Design

iSWM Manual

- **Voluntary** state of the art standards adopted for Low Impact Development (LID) in 2006 – iSWM
- Water Quality Volume (WQv)
- 85 percentile storm → 1.5 in runoff
- 24 h detention
Fee Credit Policy

• Up to 40% credit for sustainable SW practices

• Water Quality
  – Up to 25% Credit
  – 70% removal TSS
  – Runoff treated as per iSWM standards
  – Credit to individual impervious areas draining to a single outfall rather than a site as a whole
Problem Statement

- Water quality and LID are voluntary
- Credit program seldom utilized
- Limited local experience in design for local engineers and architects
- iSWM design criteria and credit policy are still developing

*Fort Worth adopted a proactive approach to promote applications that made sense environmentally, socially and economically using the CREDIT POLICY*
Objective

• Promote Sensitive Stormwater Management Practices
  – Improve water quality
  – Feasible ($)
  – Functional (O&M)
  – Attractive
  – Recognize/Reward
Methodology

• Identification of existing practices through the use of a consultant
• Minimal retrofitting
• Education of engineering community to promote more applications
• Ideal Candidates → Schools
  – Large footprints
  – Green areas
  – Outreach opportunity
Charles Baxter Middle School

Total Credits: 25%
Annual Savings: $2,138
TSS Removal Target: 80%

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<th>TSS Removal Rate</th>
<th>% WQ Credit</th>
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COFW Storm Water Credit Program:

- Cornerstone Baptist – Grassed Channel – 21% ($667/y)
- BRIT Green Roof – 23% ($1,866/y)
- John Tidwell- Dry Basin/Bioswale/Wetland – 25%
- Brewer HS Grass Pavers and Pond – 5% ($4,750/y)
Conclusions

PILOT STUDY

• Inlet controls are effective floatables, debris and sediment
• Combined ARS/CPS sweeping train outperforms the CPS only system
• PCBs and nutrients removed at levels that produce a positive impact
• Tested BMPs cost-effective retrofitting option for improving WQ
Stormwater Fee Credit to Promote LID

• Retrofitting with GI is a feasible way to reward, showcase and educate community on ways to achieve WQ benefits

• Engineering and architectural community interested and willing to participate

• Credit Policy and iSWM standards require and will be refined as part of this exercise
Next Steps

• Pilot Study Expansion- 200 additional inlets in the Downtown Area
• Boom systems and end-of-pipe units
• Further refine Credit Policy and iSWM design Manual
• Continue to offer assistance and credit to sites utilizing sensitive LID practices to showcase and educate → workshops
QUESTIONS

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