CITY COUNCIL MEETING

NOVEMBER 26, 2019

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AGENDA

Technical

Storm Water Management Overview

What is Flood Control? What is Flood Risk?

What is Water Quality? What is LID?

How does Integrated Stormwater Management work together?

What works in Boerne? What resources are available?

Codes and Ordinances

What kinds of LID requirements are in use across the state? Hill Country?

What kind of language can be incorporated into the City of Boerne Code?

Look at examples and discuss pro and cons

Build consensus on how to account for LID in site design and storm water design

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CITY OF BOERNE CODE

EXISTING CODE ELEMENTS

FLOOD PLAIN MANAGEMENT REQUIREMENTS MEET THE FEMA MINIMUM STANDARDS.

WATER SUPPLY PROTECTION WAS ONLY REQUIRED IN THE DRAINAGE AREA OF BOERNE CITY LAKE FOR FIRST 0.5 INCHES OF RUNOFF

STREAM SETBACKS ARE REQUIRED ON WATERSHEDS DRAINING MORE THAN 100 ACRES THAT CONTRIBUTE TO BOERNE CITY LAKE.

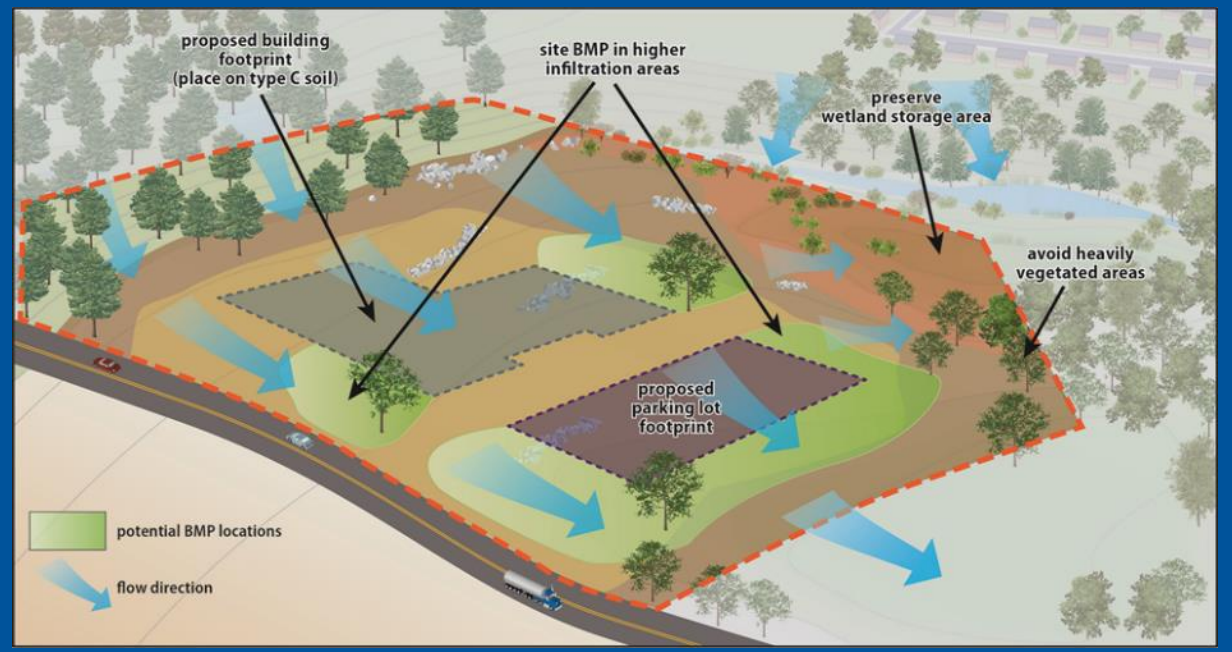
STREAM SETBACKS ARE REQUIRED ON ALL STREAMS STARTING AT A 35 ACRE WATERSHED

LID IS NOW REQUIRED ON ALL NEW DEVELOPMENTS

CODE INCLUDES PROVISIONS TO ALLOW LID IN LANDSCAPING AND OPEN SPACE AREAS.

WHAT IS "LOW IMPACT DEVELOPMENT" (LID)?

Low impact development (LID) is a term used to describe a **land planning and engineering** design approach to managing stormwater runoff. LID emphasizes conservation and use of **on-site natural features to protect water quality.** This approach implements engineered small-scale hydrologic controls to **replicate the pre-development hydrologic regime** of watersheds through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source.



Preserve Flow Rate, Volume, Temperature and Quality

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WHAT ARE THE BENEFITS OF INTEGRATED STORMWATER MANAGEMENT?

IMPROVE QUALITY OF LIFE

PROTECT RIPARIAN AREAS

INCREASE PROPERTY VALUES

IMPROVE/ENHANCE AESTHETICS

REDUCE INFRASTRUCTURE AND MAINTENANCE COSTS

WHERE DOES LID FIT?

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INTEGRATED STORMWATER MANAGEMENT

WHAT WORKS IN BOERNE?

Trees

- Intercept rain water
- Provide shade in summer and block wind in winter
- Reduce greenhouse gases by absorbing CO_2

Rain Barrels and Cisterns

- Reduce water consumption and associated costs
- Reduce demand for potable water
- Increase available water supply for other uses

Bioswales and Rain Gardens

- Improve property and neighborhood aesthetics
- Reduce localized flooding
- Promote infiltration and groundwater recharge

Permeable Pavements

- Reduce stormwater runoff
- Reduce standing water
- Promote infiltration and groundwater recharge

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TRIPLE BOTTOM LINE INDICATORS

ECONOMIC

- JOB CREATION
- REDUCED INFRASTRUCTURE COST

SOCIAL

- IMPROVED QUALITY OF LIFE AND AESTHETICS
- INCREASED RECREATIONAL OPPORTUNITIES

ENVIRONMENTAL

- REDUCED STORMWATER VOLUME
- REDUCED SEDIMENT LOADING
- INCREASED GROUNDWATER RECHARGE

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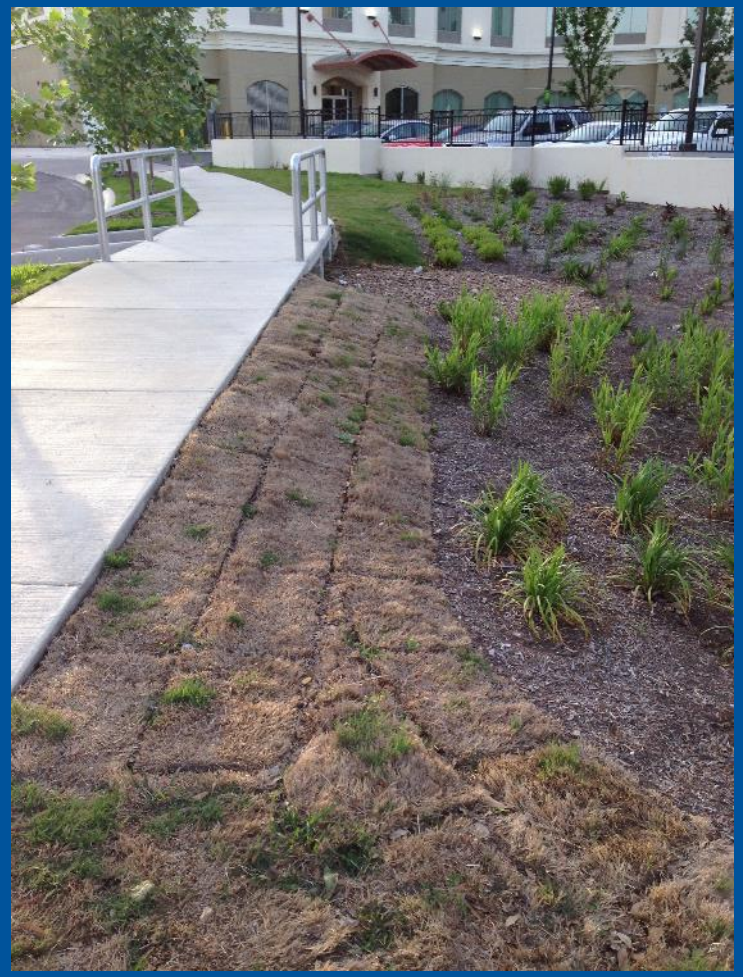
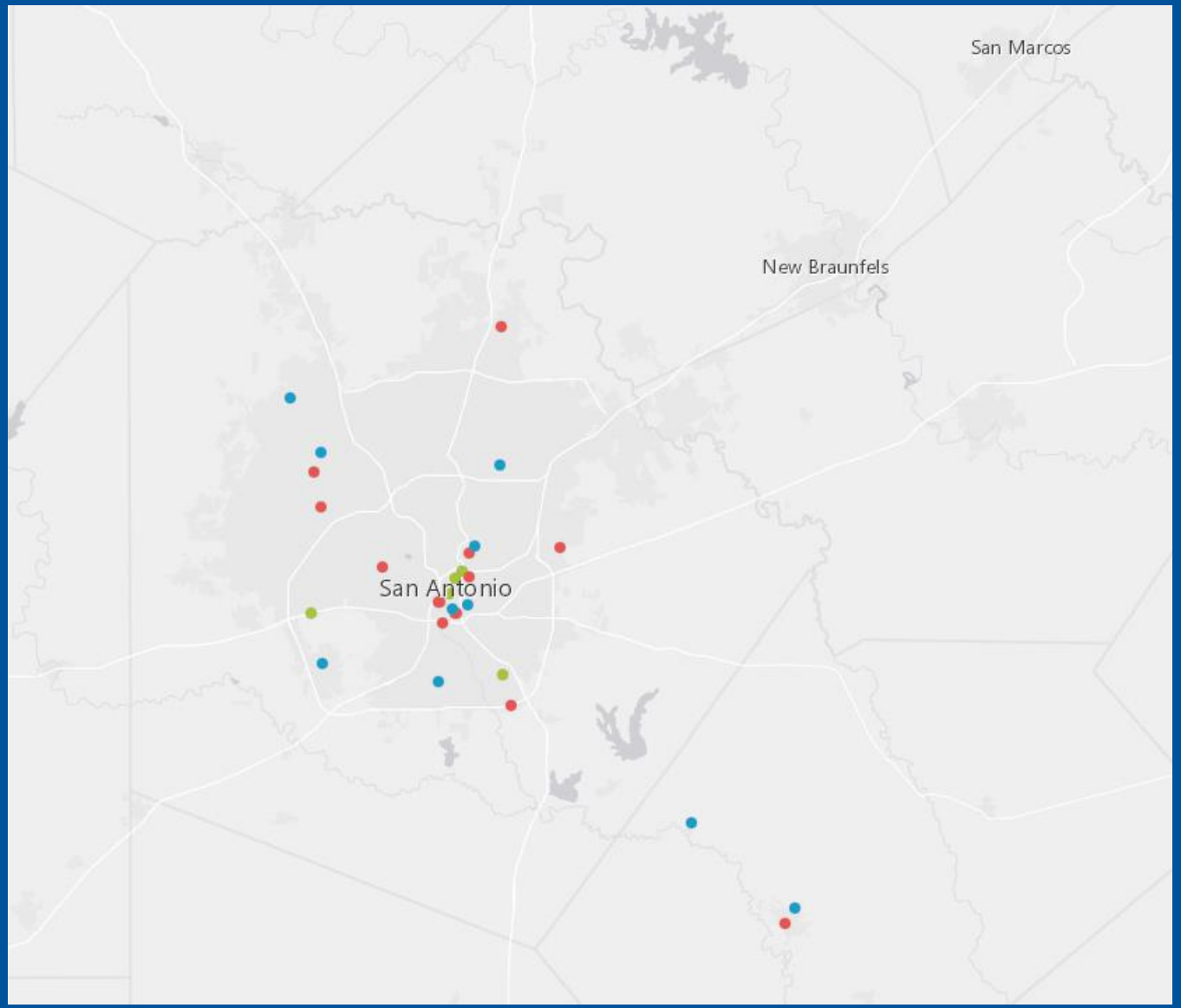
LOCAL FUNDED EXAMPLES





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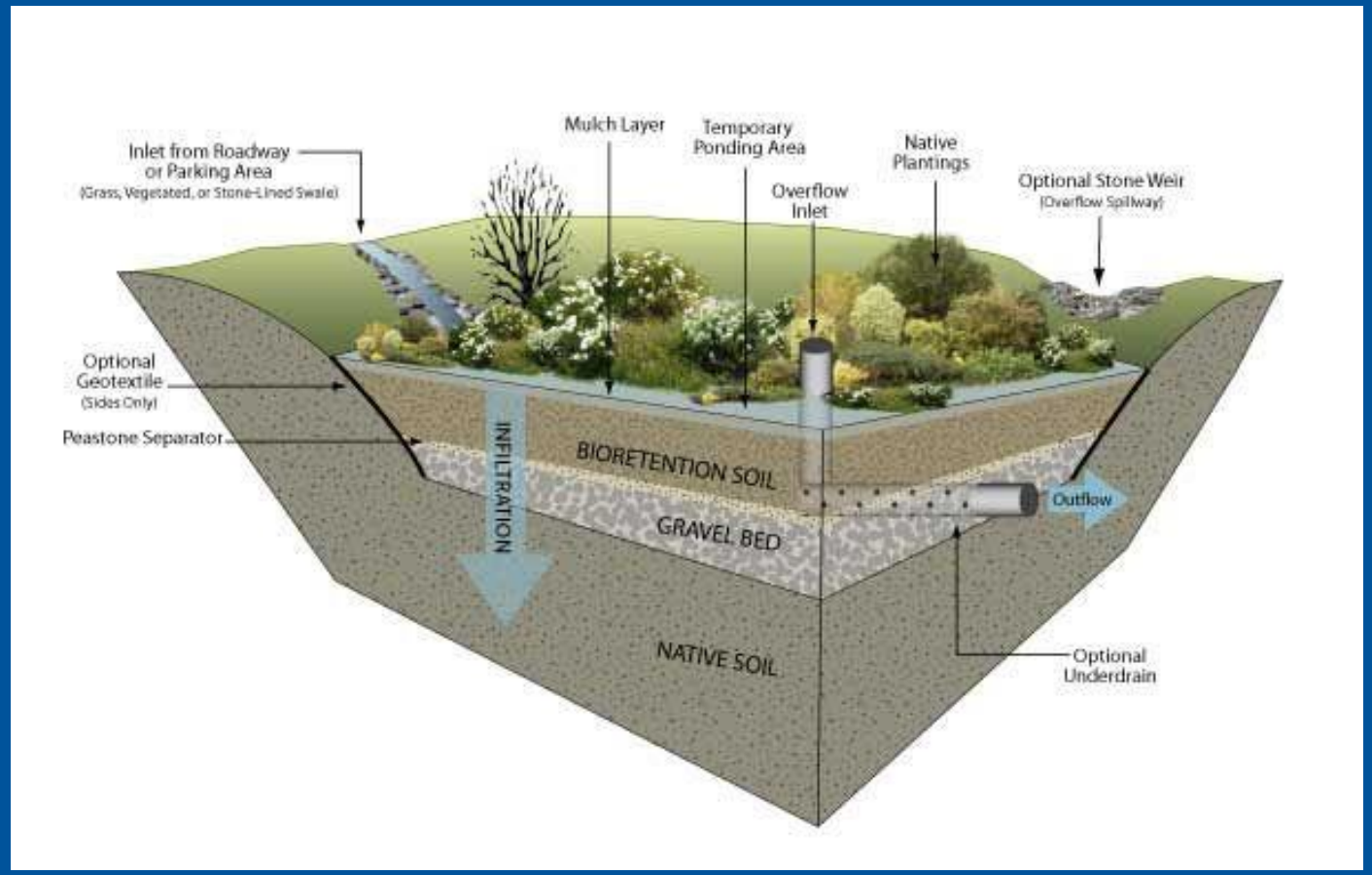
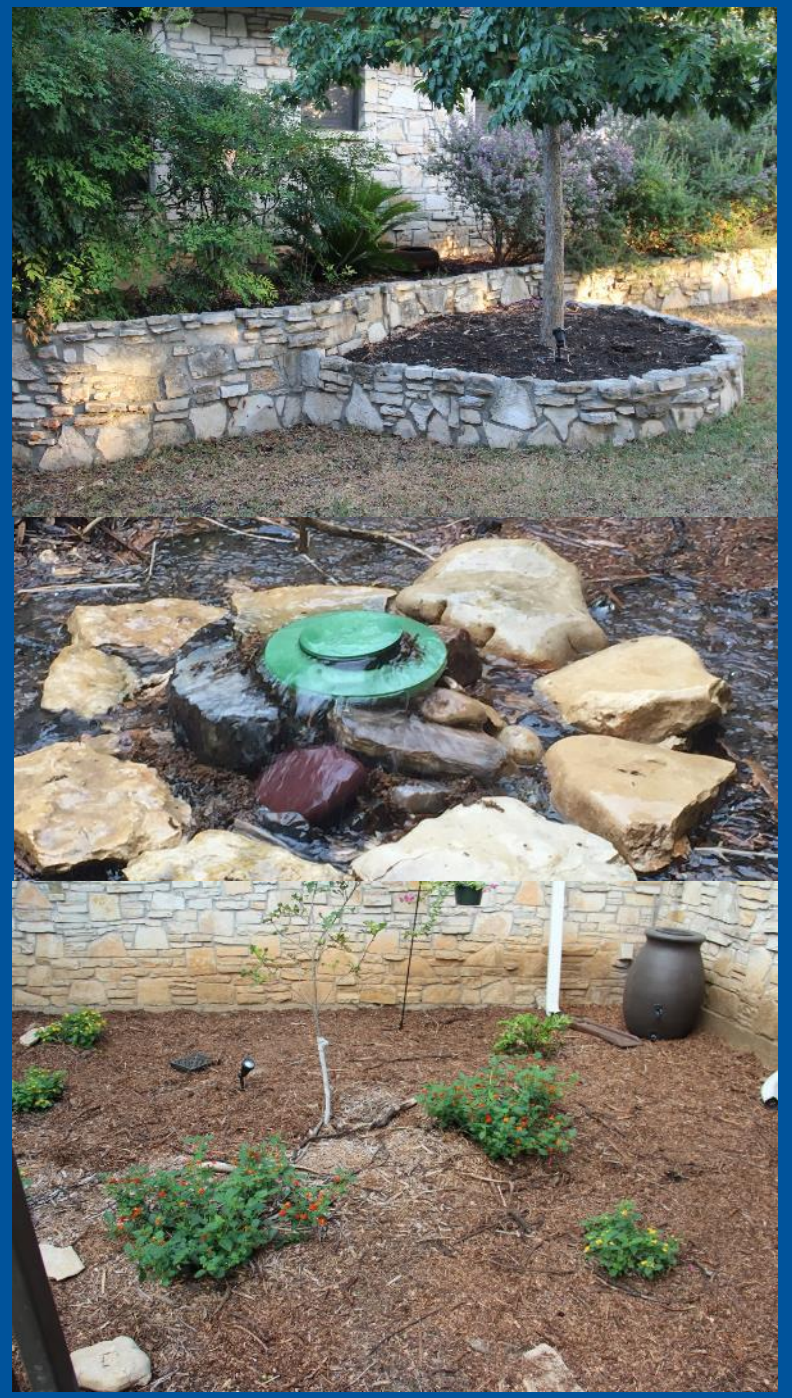
LOCAL EXAMPLES –RESIDENTIAL





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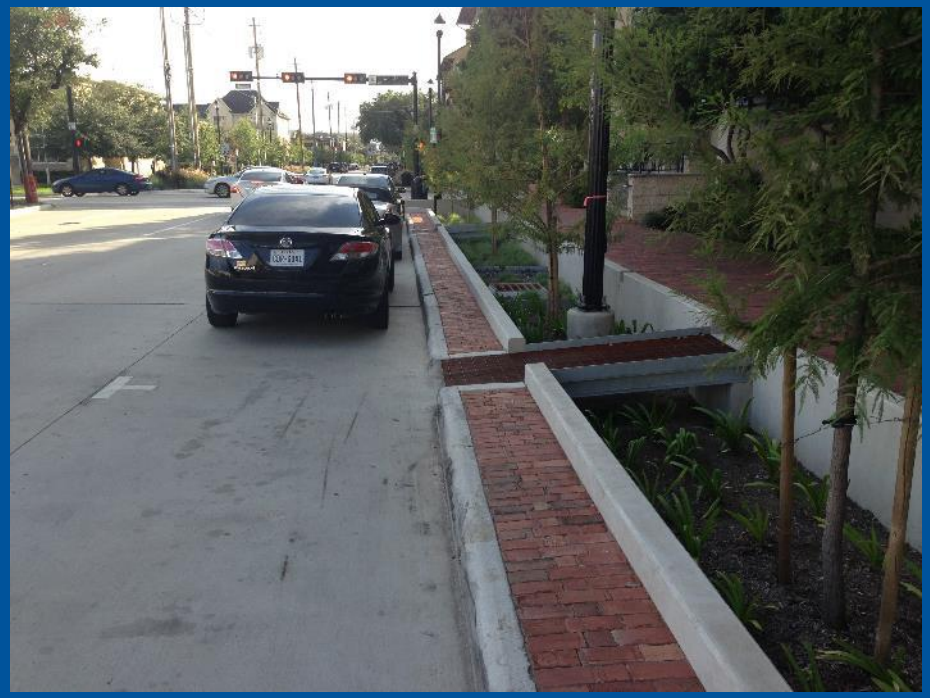
LOCAL EXAMPLES – PUBLIC



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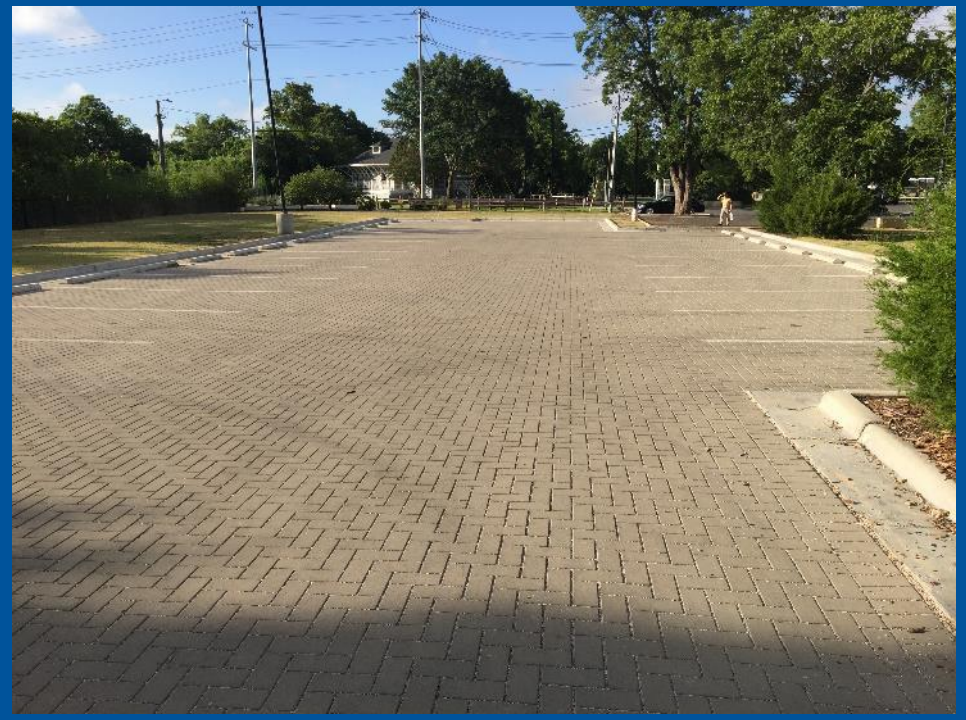
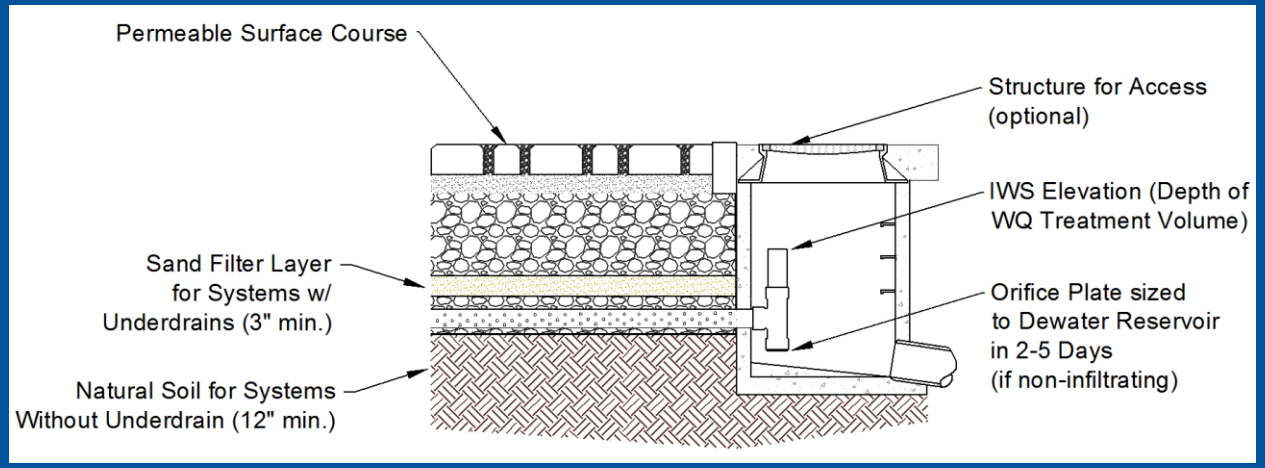
LOCAL EXAMPLES – MUNICIPAL





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LOCAL EXAMPLES – COMMERCIAL

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PROPOSED UPDATES CODE ELEMENTS

- **FLOODPLAIN MANAGEMENT**
  - ✓ UPDATE requirements to better protect property from flood risks.
- **STREAM SETBACKS**
  - ✓ REVISE requirements to align with regional and state guidance.
- **LID CODE**
  - ✓ ESTABLISH performance standards consistent with understanding of water quality science and stream protection.

SUBDIVISION ORDINANCE - ARTICLE 6

SECTION 01 – DRAINAGE REGS/ GENERAL REQUIREMENTS

- Drainage Regulations and General Requirements
- No adverse impacts upstream, downstream or adjacent properties
- Developers to determine local floodplain and base flood elevations

CODE OF ORDINANCES - CHAPTER 9 – FLOOD DAMAGE PREVENTION

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ARTICLE 6 SECTION 01 – SUBDIVISION ORDINANCE

DRAINAGE REGULATIONS

&

GENERAL REQUIREMENTS

- **ADVERSE IMPACTS DEFINITION:**

REFINE LANGUAGE TO CLARIFY PROTECTION OF UPSTREAM, DOWNSTREAM AND ADJACENT PROPERTIES TO CONFIRM NO ADVERSE IMPACT

- **LOCAL FLOODPLAINS:**

ADD REQUIREMENT FOR OWNER/DEVELOPER TO PROVIDE A DETAILED FLOODPLAIN MAP WITH BASE FLOOD ELEVATIONS FOR ANY DEVELOPMENT AND REDEVELOPMENT

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CHAPTER 9 – FLOOD DAMAGE PREVENTION

FLOOD HAZARDS

- Define local floodplain
- Establish regulatory requirements for local flood plain and determine base flood elevations
- Limit encroachments in the flood plain

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ARTICLE 3 SECTION 06 – SUBDIVISION ORDINANCE

LOW IMPACT DEVELOPMENT FACILITIES

- Require design to match predevelopment volume and flow rate
- Amend runoff volumes
- Remove 60% of the bacteria load and 80% of the calculated TSS particles
- Require more stringent treatment in Water Supply Protection Zones to meet LID requirements

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ARTICLE 1 SECTION 06. – ZONING ORDINANCE

STREAM SETBACKS

STREAM SETBACK: An area that extends horizontally landward a specified distance from each side of a stream bank.

(ORD. NO. 2012-04, §1, 4-24-2012)

a. Stream Setback Zone 1 is the streamside zone and is measured from the stream center line ~~stream bank or ordinary high water mark (OHWM).~~

Drainage Area (Acres) Or as shown on the City's stream setback map.	Setback Zone 1	Setback Zone 2	Total Setback Width (each side)
~~> 35 acres and less than 200 acres~~	~~20'~~	~~15'~~	~~35'~~
~~> 200 acres and less than 1500 acres~~	~~30'~~	~~20'~~	~~50'~~
~~> 1500 acres~~	~~50'~~	~~50'~~	~~100'~~
>25 acres and less than 128 acres	25' –> 35'	20'	45' –> 55'
>128 acres and less than 320 acres	40' -> 55'	30'	70' -> 85'
>320 acres and less than 640 acres	50' -> 70'	50'	100'-> 120'
>640 acres	75' –> 100'	50'	125' –> 150'

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SECTION 06. – SUBDIVISION ORDINANCE

PROTECTION OF SURFACE WATER SUPPLIES

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6.06.002 Water Supply Protection Zones – “Stream Setbacks”

Water Supply Protection Zones within the area draining into a lake which is used or intended to be used by the City as a surface reservoir for drinking water shall be defined as the Stream Setbacks established under Zoning Ordinance Article 1 Section 6. On all sides around the shores of any lake which is used or intended to be used by the City as a surface water reservoir, the buffer zone shall be a minimum of 200 feet.

6.06.007 Stormwater Retention/Detention in Zone Drainage Areas

All stormwater management facilities in drainage basins above a City water supply reservoir shall be designed as Low Impact Development.

QUESTIONS?

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