
TIRZ 17 Drainage Presentation

October 15, 2009



Presentation Outline

- **About TIRZ 17**
- **Drainage Concepts & Criteria**
- **April 28th, 2009 Event Summary**
- **W151 Presentation - HCFCDD**
- **TIRZ 17 Drainage Initiatives: Past, Present, and Future**

10/15/2009



What is a “TIRZ” ?

- **Special District Created by the City of Houston**
- **Promote New Development & Redevelopment**
- **Limited Geographic Area**
- **Tax Increment Reinvestment Zone**
 - Funded by Property Taxes

10/15/2009

“A” – Current Tax Revenue

“B” - Base-line Tax Revenue to the City

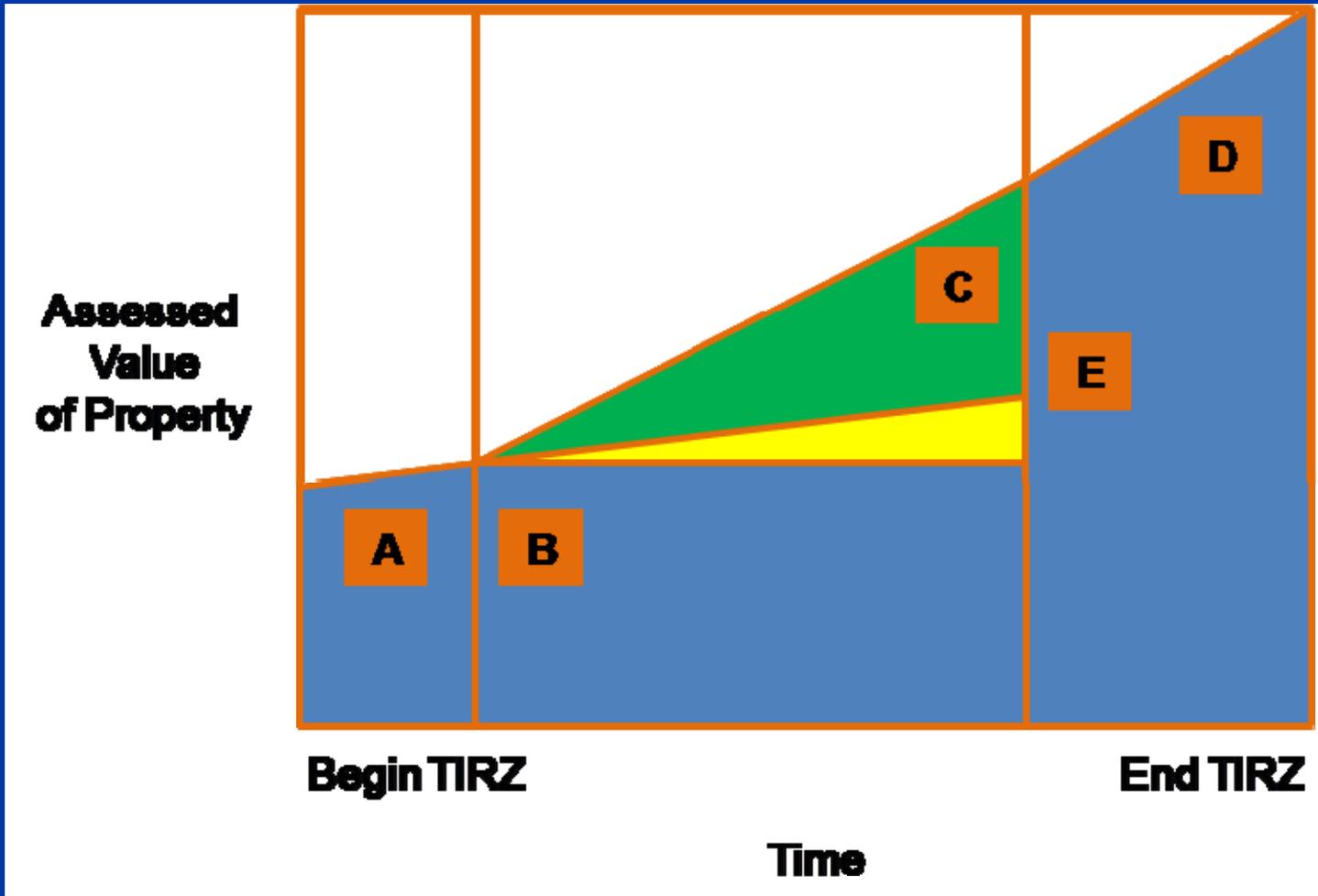
“C” - Tax Increment

“D” – Total Tax Revenue Reverts to City

“E” – TIRZ 17 Oversight and Public Safety Portion



What is a "TIRZ" ?



"A" – Current Tax Revenue

"B" - Base-line Tax Revenue to the City

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"E" – TIRZ 17 Oversight and Public Safety Portion

10/15/2009



- **Fund Needed Public Infrastructure**
 - Drainage & Mobility Improvements
- **Build Enhancements and/or Amenities into Infrastructure projects**
- **Develop Green Space for Improved Quality of Life**
- **Encourage Quality Private Investments Through Public Improvements**

10/15/2009



- **Own Property**
- **Exercise Power of Condemnation**
- **Permit or Approve
Development/Improvement Plans**
- **Maintain Infrastructure**
- **Fund Improvement Projects not
Benefiting the TIRZ**

10/15/2009



- **Original Financing Plan - \$239.3 Mil**
 - Spring Branch ISD
 - Harris County
 - City of Houston
- **Revised (Current) Financing Plan - \$114.4 Mil**
 - City of Houston

10/15/2009



Total Project Cost

| | Financing Plan | Project Costs through 2014 CIP |
|--|----------------|--------------------------------|
| Tax Increment Funding | | |
| Harris County | 0 | |
| Spring Branch ISD | 0 | |
| City of Houston | 114.4 | |
| Total Funding | 114.4 | |
| Allocation of Funds | | |
| Drainage | 31.4 | 34.3 |
| Roadway | 69.0 | 52.7 |
| Parks, Landscaping | 14.0 | 1.7 |
| School & Educational Improvements | 0.0 | 0.0 |
| Total Allocation | 114.4 | 89.0 |
| <i>Note: Values shown in Millions of Dollars</i> | | |

TIRZ 17 Initiatives Project Summary

About TIRZ 17

| Project Name | Construction Cost | | |
|--|---------------------|------------------------------------|---------------------|
| | Drainage Portion | Mobility & Quality of Life Portion | Total |
| Completed Initiatives | | | |
| Gessner Road Widening | \$3,361,592 | \$7,843,714 | \$11,205,306 |
| Queensbury Lane Drainage Improvements | \$545,086 | \$0 | \$545,086 |
| Bunker Hill Widening | \$1,090,048 | \$6,176,939 | \$7,266,987 |
| Rummel Creek Floodplain Reduction Study | \$64,350 | \$0 | \$64,350 |
| Briar Branch Floodplain Study | \$117,165 | \$0 | \$117,165 |
| Kingsride East Bound at Gessner Road | \$0 | \$669,467 | \$669,467 |
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| North Gessner Mobility and Drainage Improvements | \$2,411,310 | \$4,895,690 | \$7,307,000 |
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| Subtotal | \$9,149,201 | \$5,921,440 | \$15,070,641 |
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| West Bough Roadway Improvements | \$520,750 | \$1,562,250 | \$2,083,000 |
| Various Roadway Improvements | \$775,688 | \$3,754,711 | \$4,530,398 |
| Various Green Space Improvements | \$0 | \$1,021,000 | \$1,021,000 |
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| Total | \$20,209,129 | \$31,199,271 | \$51,408,400 |

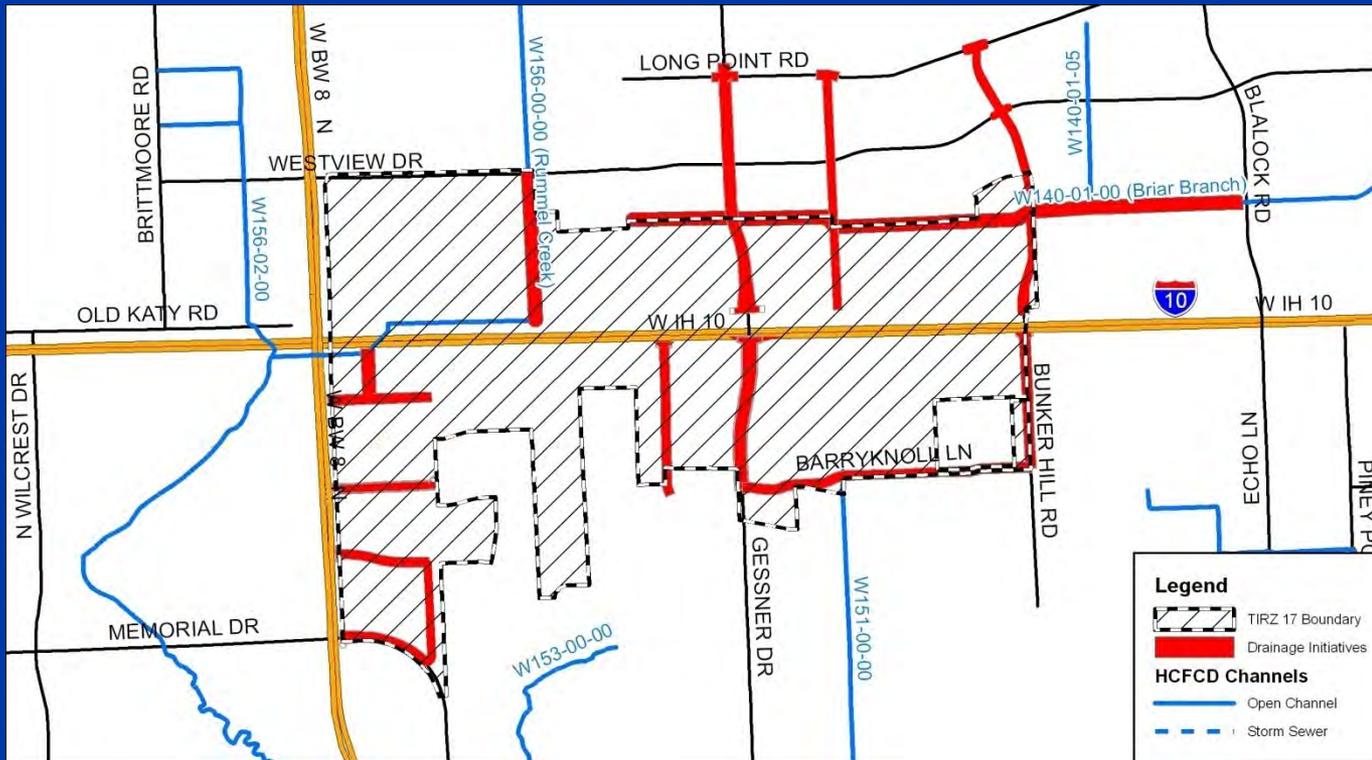
Source: 2009-2014
CIP

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TIRZ 17 Drainage Initiatives

About TIRZ 17



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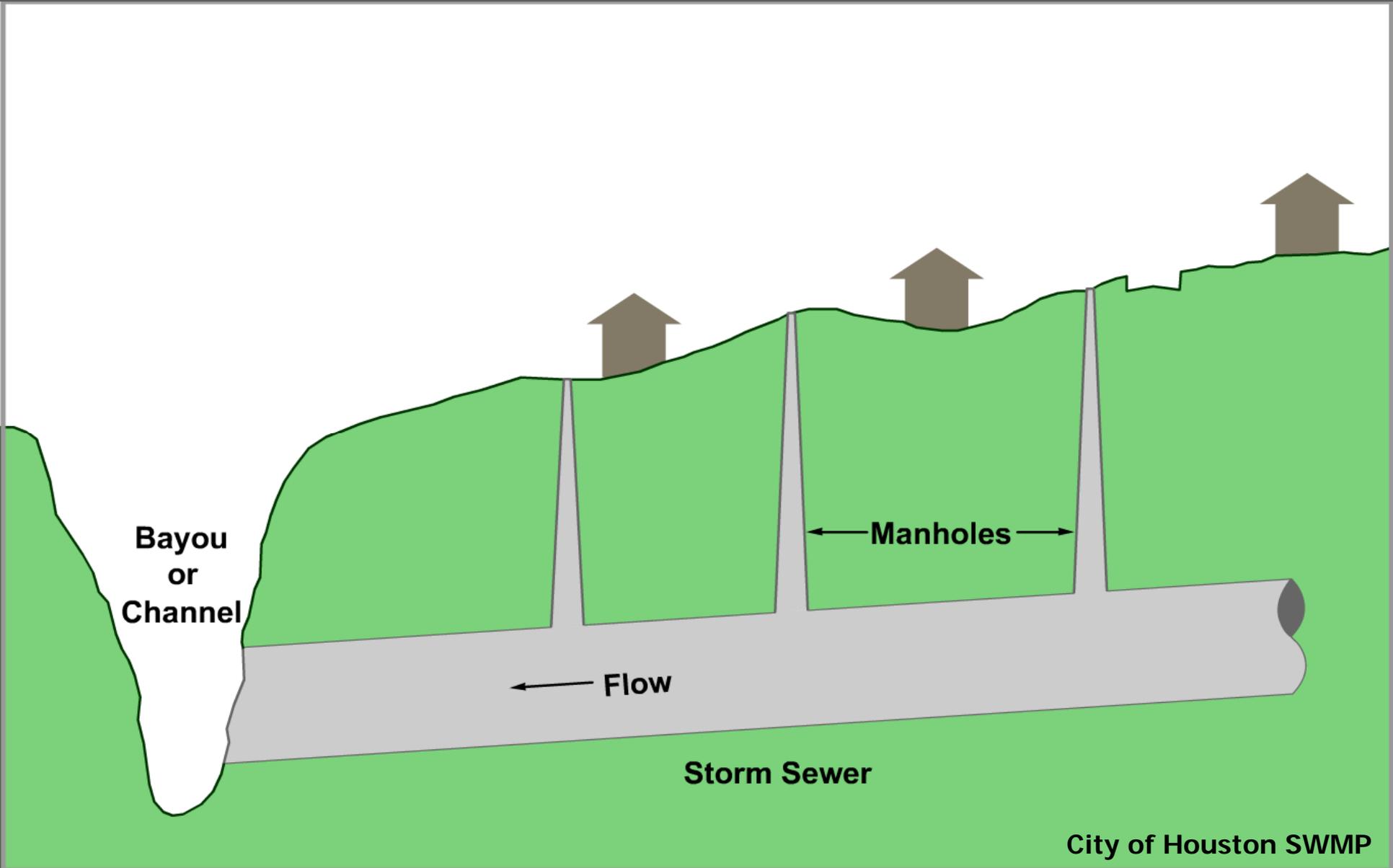
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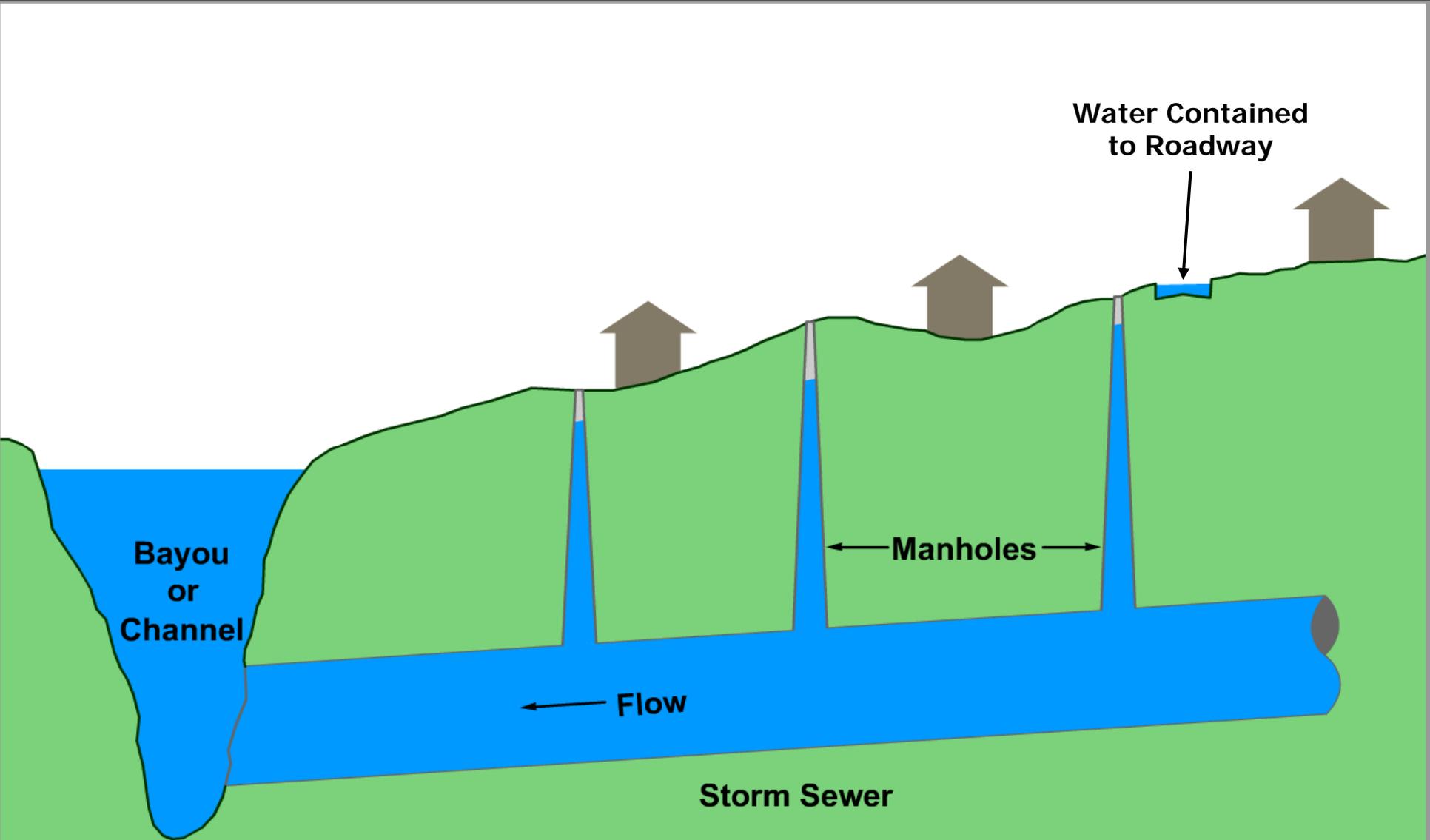
10/15/2009



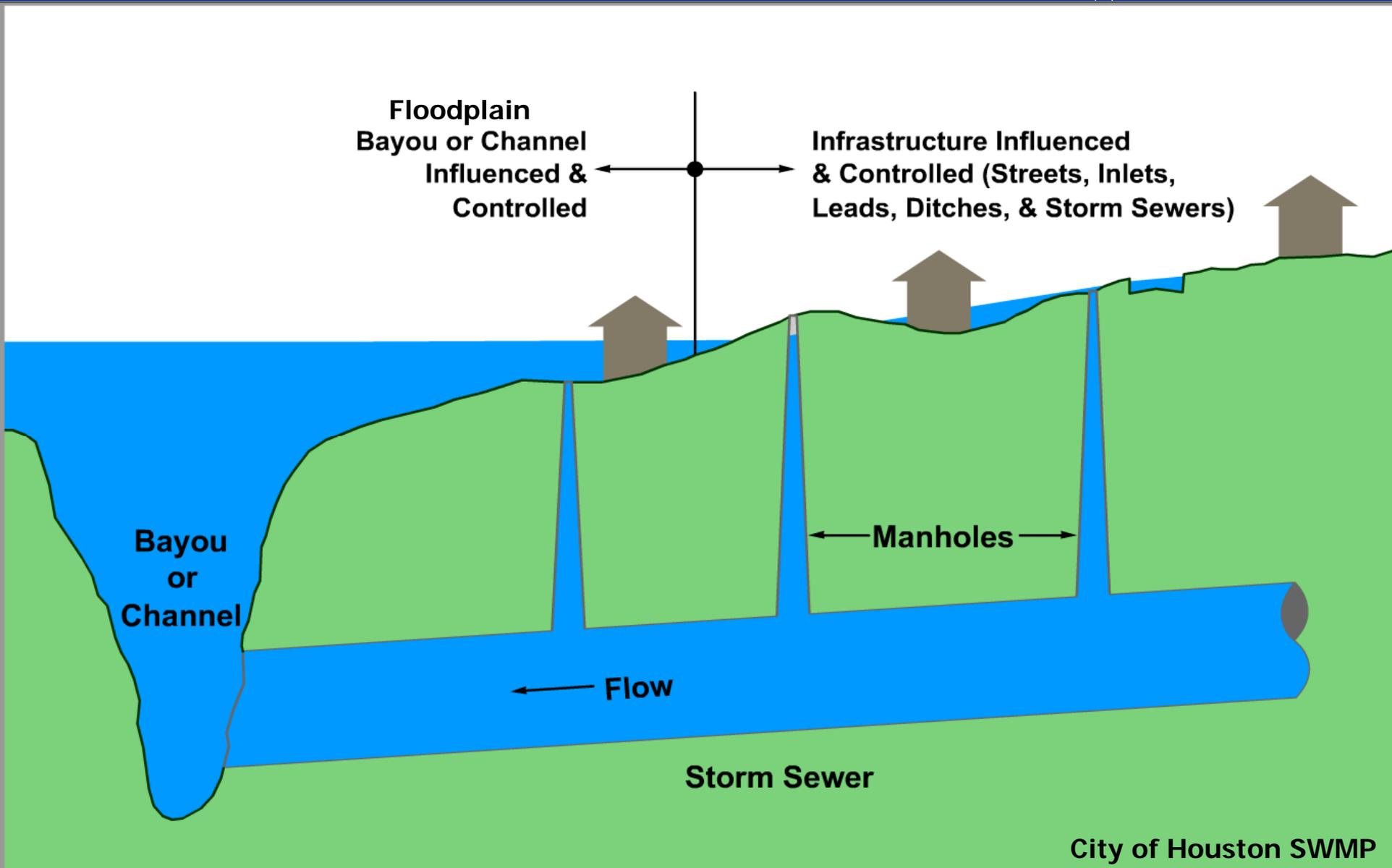
Typical Infrastructure System



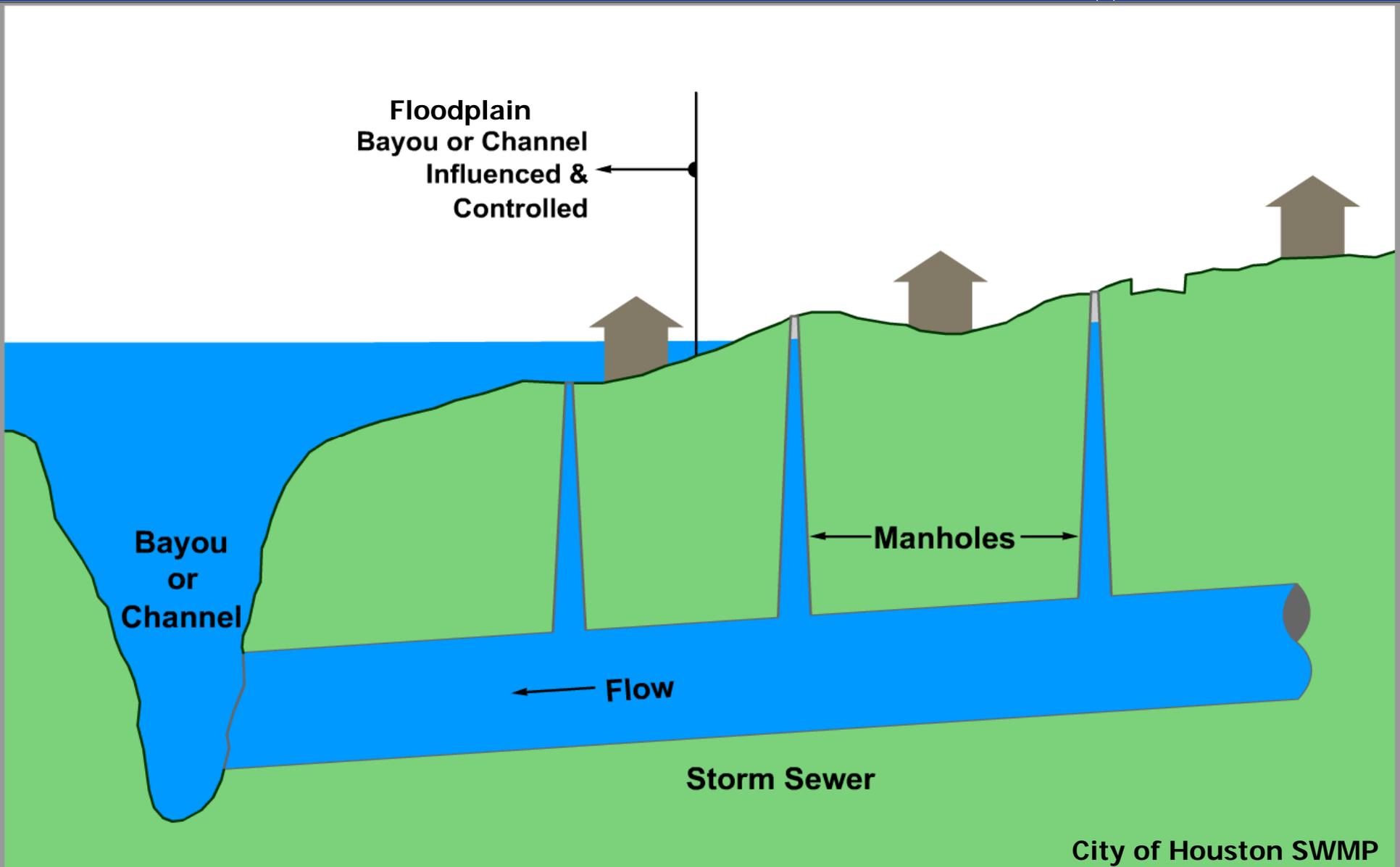
Desired Condition

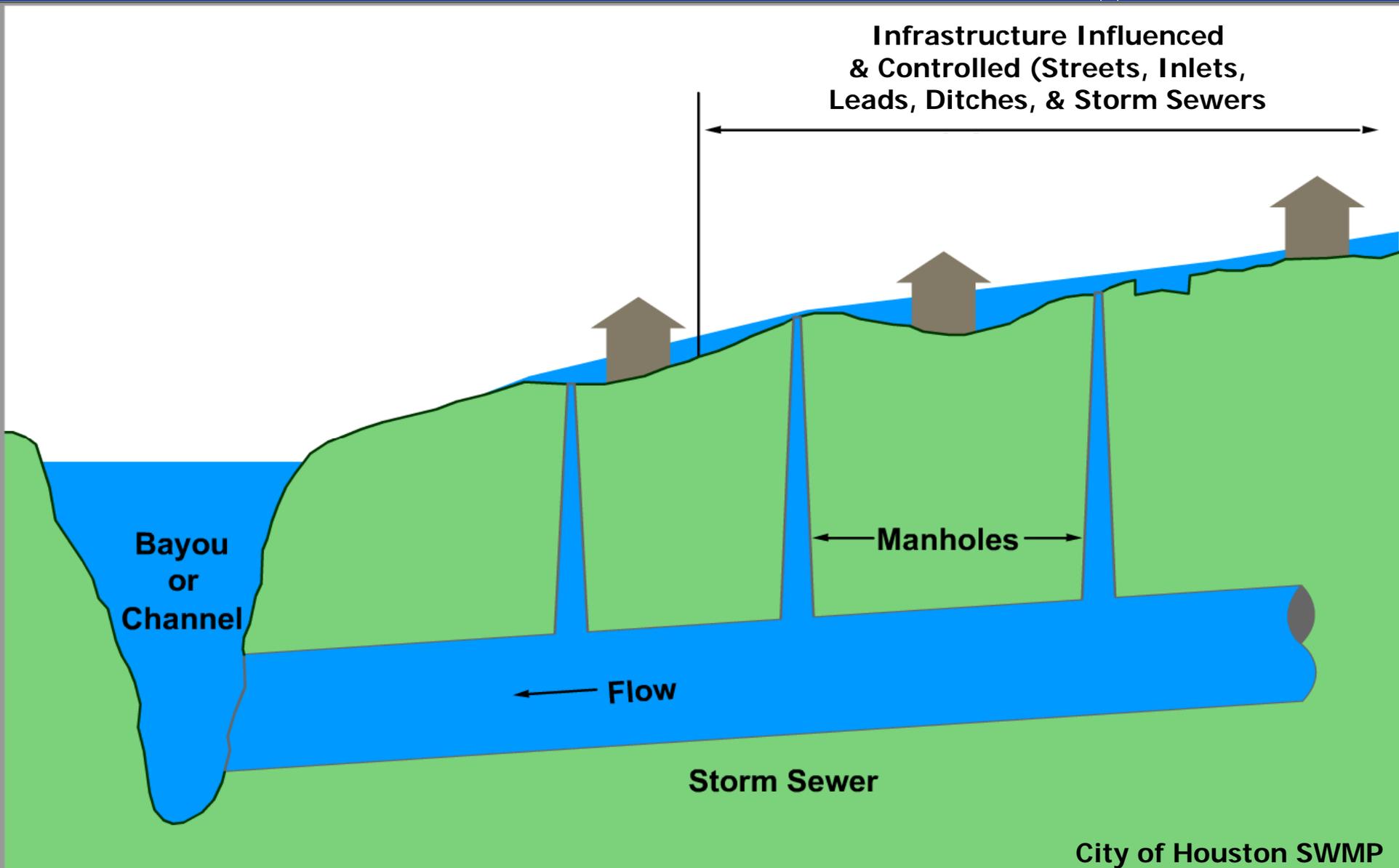


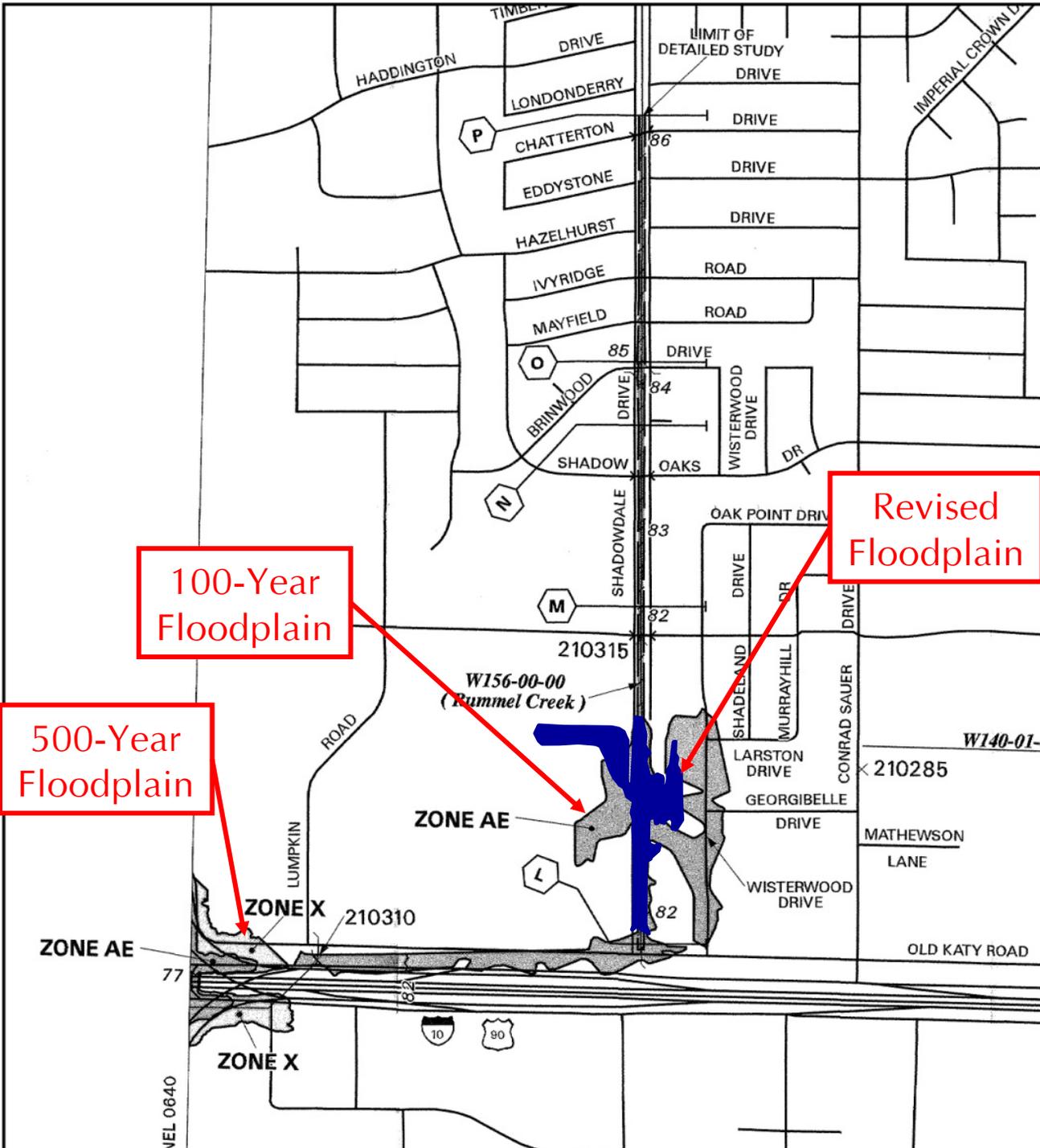
Typical Flooding Scenario



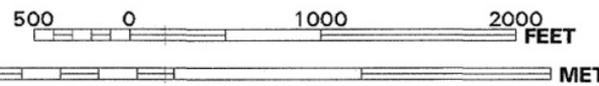
Bayou or Channel Flooding







MAP SCALE 1" = 1000'



PANEL 0645L

FIRM
FLOOD INSURANCE RATE MAP
 HARRIS COUNTY,
 TEXAS
 AND INCORPORATED AREAS

PANEL 645 OF 1150
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|-------------------------|--------|-------|--------|
| HOUSTON, CITY OF | 48296 | 0645 | L |
| SPRING VALLEY, CITY OF | 482919 | 0645 | L |
| HEDWIG VILLAGE, CITY OF | 48294 | 0645 | L |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER
 48201C0645L

MAP REVISED:
 JUNE 18, 2007

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

10% (10-Yr.) Flood



During any single year:
House A has a 10% chance
of flooding.

During a 30 year mortgage:
House A has a 95% chance
of flooding.

NOTE: 10-YR. LIMITS ARE
NOT SHOWN ON ACTUAL
FEMA FLOOD INSURANCE
RATE MAPS.

NOT AN ACTUAL FEMA FLOOD INSURANCE RATE MAP. FOR REPRESENTATION ONLY.

©2003 Harris County
Flood Control District

10% (10-Yr.) Flood

1% (100-Yr.) Flood



During any single year:
House A has a 10% chance
of flooding.

During a 30 year mortgage:
House A has a 95% chance
of flooding.

During any single year:
House B has a 1% chance
of flooding.

During a 30 year mortgage:
House B has a 26% chance
of flooding.

NOTE: 10-YR. LIMITS ARE
NOT SHOWN ON ACTUAL
FEMA FLOOD INSURANCE
RATE MAPS.

LAZY MEADOWS

SHEDS RUN

FALLING CEDARS

PEAR WAY

PINNEY

NOT AN ACTUAL FEMA FLOOD INSURANCE RATE MAP. FOR REPRESENTATION ONLY.

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Flood Control District

10% (10-Yr.) Flood

1% (100-Yr.) Flood

0.2% (500-Yr.) Flood

A

B

C

During any single year:
House A has a 10% chance
of flooding.

During a 30 year mortgage:
House A has a 95% chance
of flooding.

During any single year:
House B has a 1% chance
of flooding.

During a 30 year mortgage:
House B has a 26% chance
of flooding.

During any single year:
House C has a 0.2% chance
of flooding.

During a 30 year mortgage:
House C has a 6% chance
of flooding.

NOTE: 10-YR. LIMITS ARE
NOT SHOWN ON ACTUAL
FEMA FLOOD INSURANCE
RATE MAPS.

SHAWNEE RUN

FALLING WOODS

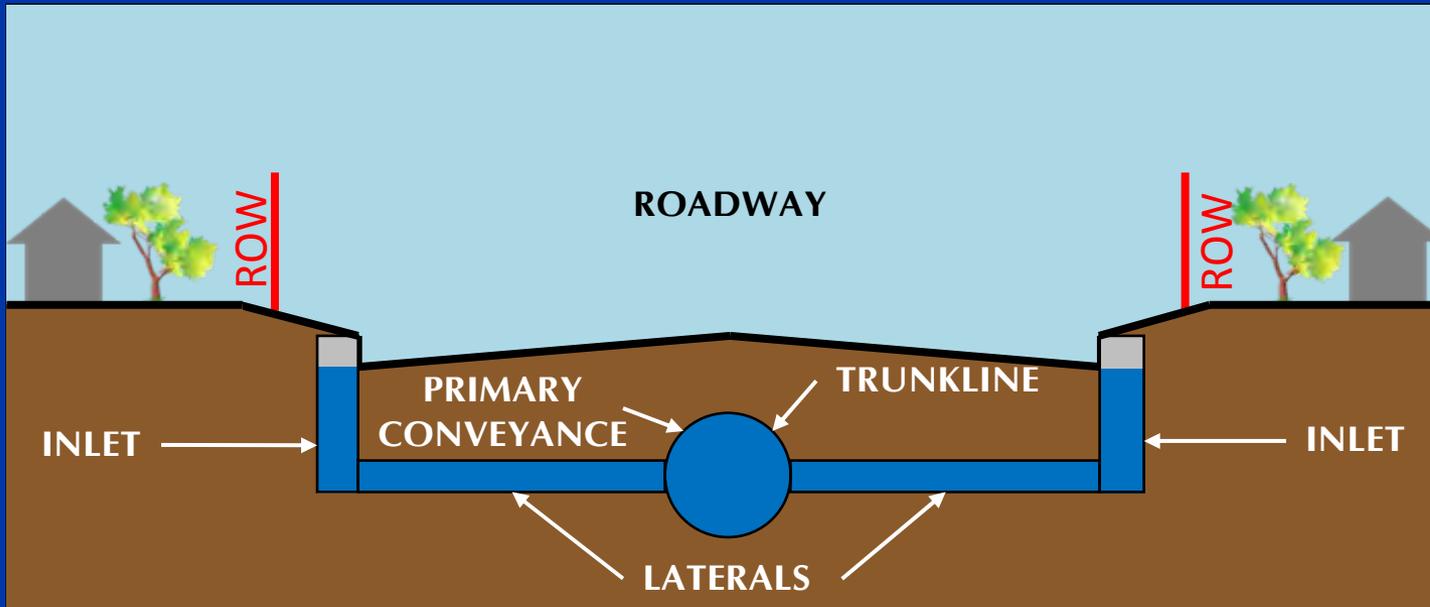
SHAWNEE

PIKEWAY

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Flood Control District

NOT AN ACTUAL FEMA FLOOD INSURANCE RATE MAP. FOR REPRESENTATION ONLY.

Current City of Houston Roadway Drainage Criteria – 2-Year Event

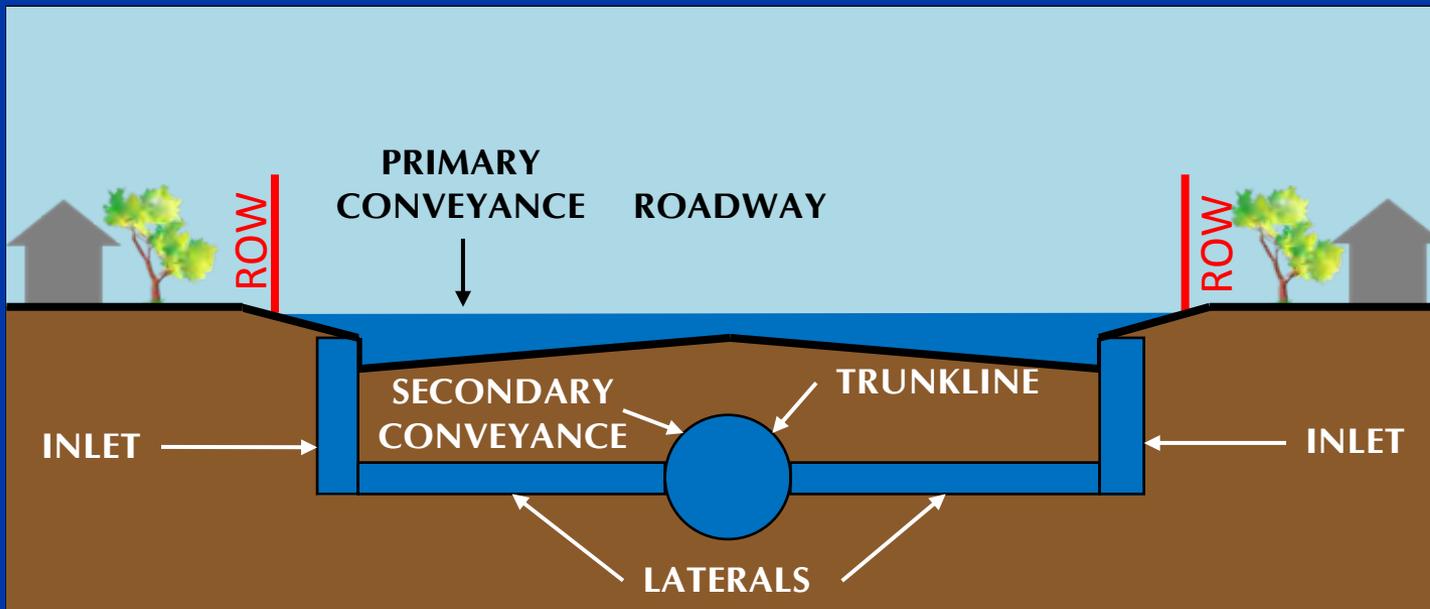


Development Criteria

- Water Surface not to Exceed Gutter Elevation
- Storm Sewers used as Primary Conveyance System

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Current City of Houston Roadway Drainage Criteria– Extreme Event



Development Criteria

- Water Surface not to Exceed Ground Elevation at ROW Line
- Streets used as Primary Conveyance System
- Provide Overland Flow Outfall

10/15/2009

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- TIRZ 17 Drainage Initiatives: Past, Present, and Future

10/15/2009

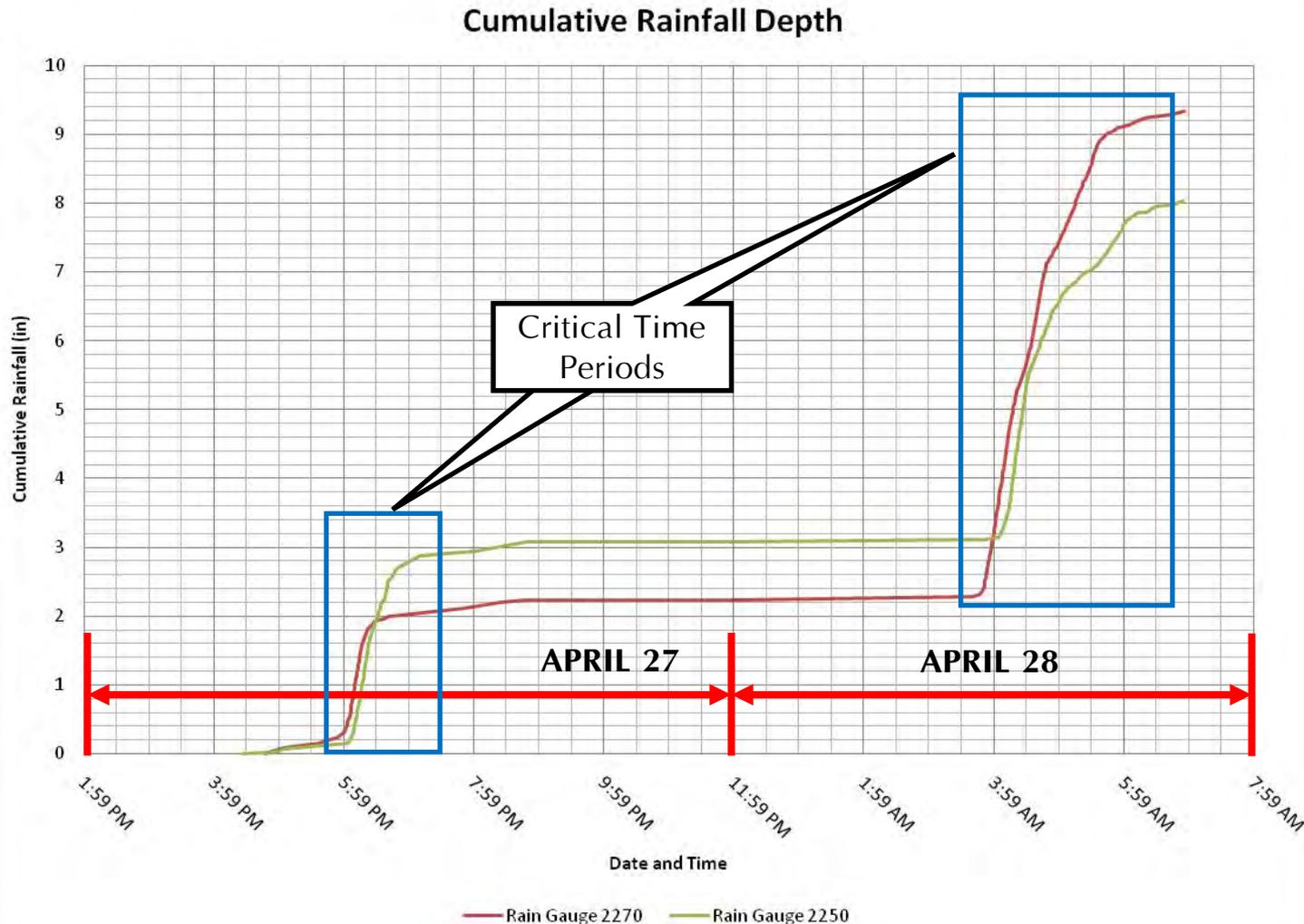


- **Third in Series of Heavy Rainfall Events Since April 18th, 2009**
- **Heavy Rains Fell Between 4:00pm and 10:00pm on the 27th**
- **Excessive Rainfall Between Midnight and 8:00am on the 28th**
 - Ground was Already Saturated
- **Record Rainfall & Channel flows**
 - 100-Year Event
- **Buffalo Bayou Rose Over 16' in 2 Hours**

10/15/2009

April 28th, 2009 Event

April 28th, Event
Summary



10/15/2009



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10/15/2009

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5/2009

- **Extensive Street Flooding**
- **Extensive Structural Flooding**
 - Over 2,168 homes County Wide
 - Over 860 homes within Buffalo Bayou Watershed
 - 4th Largest Event in Terms of Homes Flooded in Harris County History
- **Majority of Flooded Homes were Outside Mapped 100-year Floodplains**

10/15/2009

*Data Source – HCFCD Immediate Report #3 April 28, 2009 Storm And Flood Information



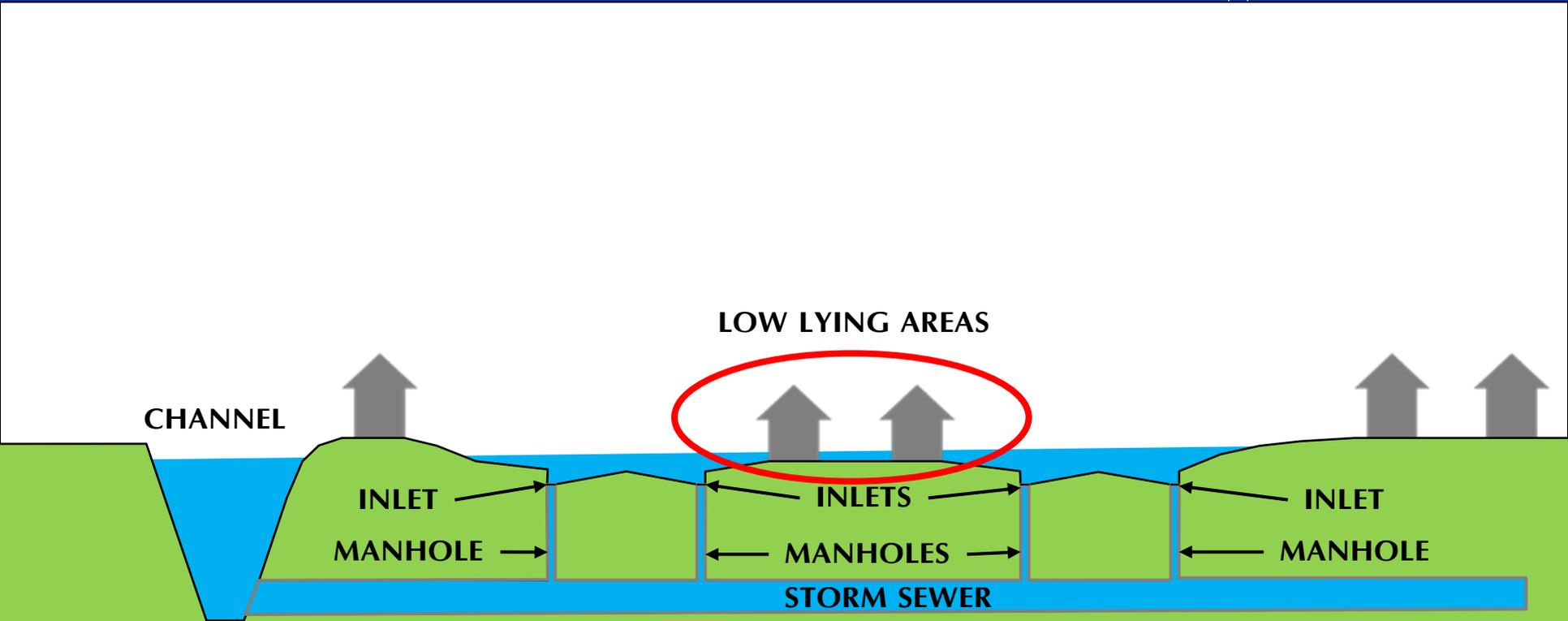
- **Low Lying Communities Relative to Channel Banks**
- **Low Slab Elevations**
- **Older/Smaller Storm Sewers**
- **Overland Flow Problems & Excessive Ponding**
- **Insufficient Detention**

10/15/2009

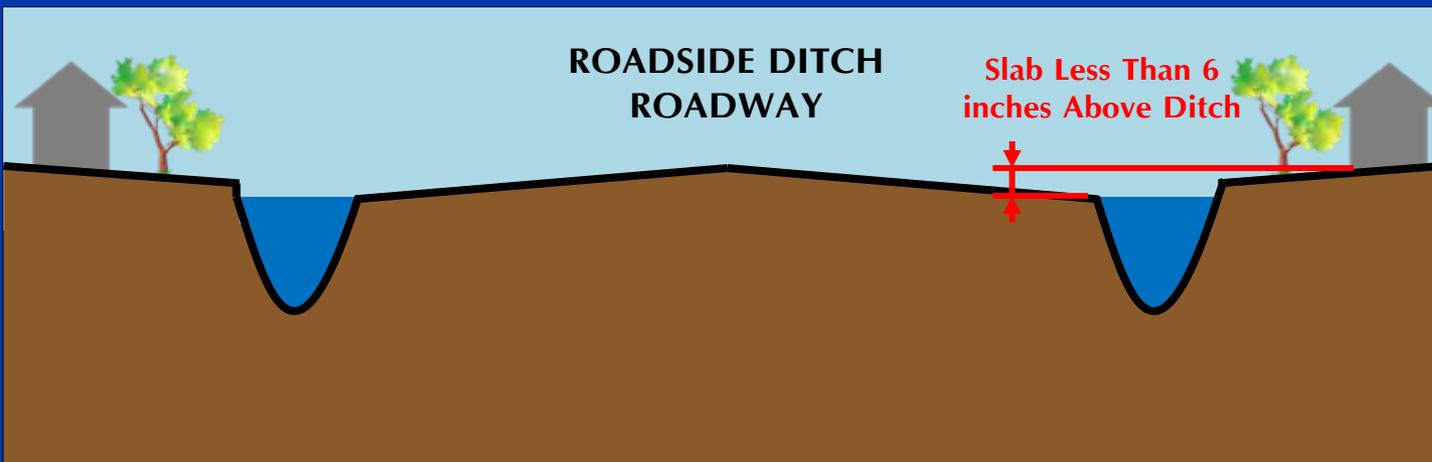
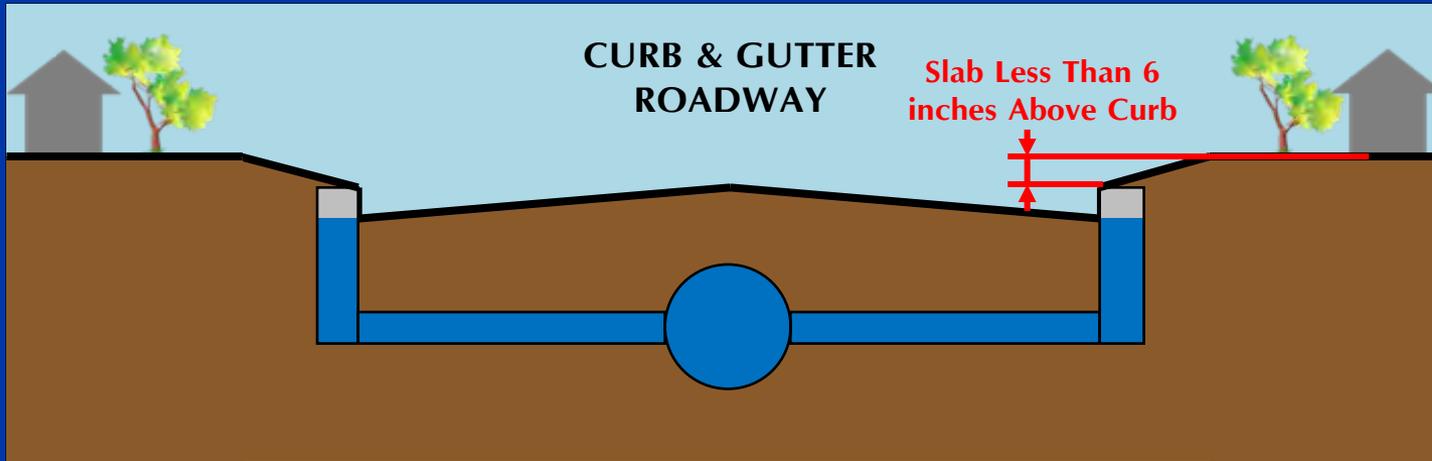


Low Lying Communities Relative to Channel Banks

April 28th, Event
Summary

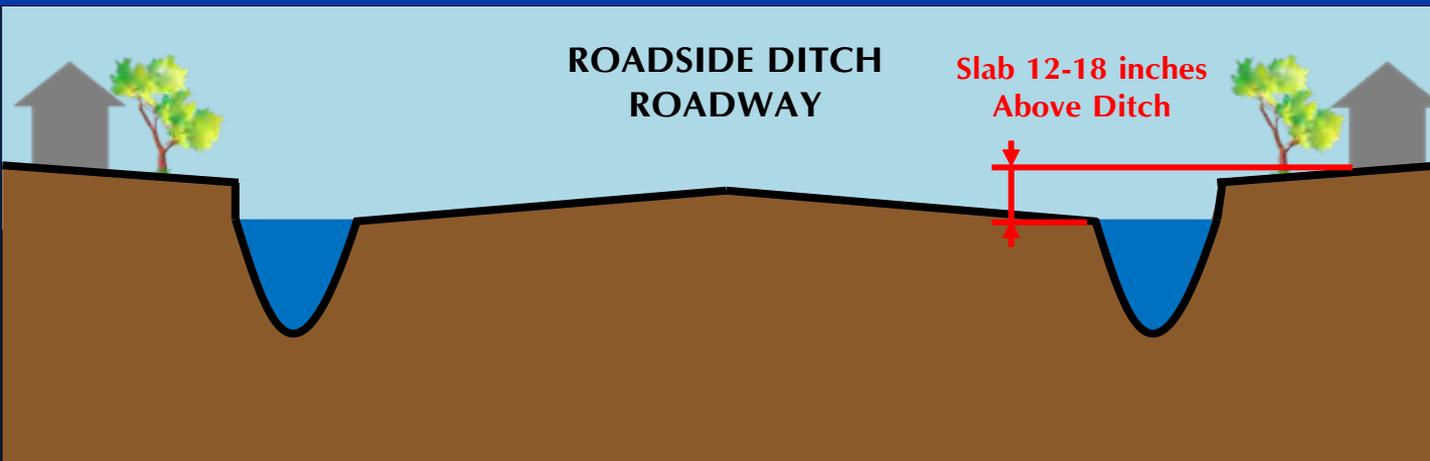
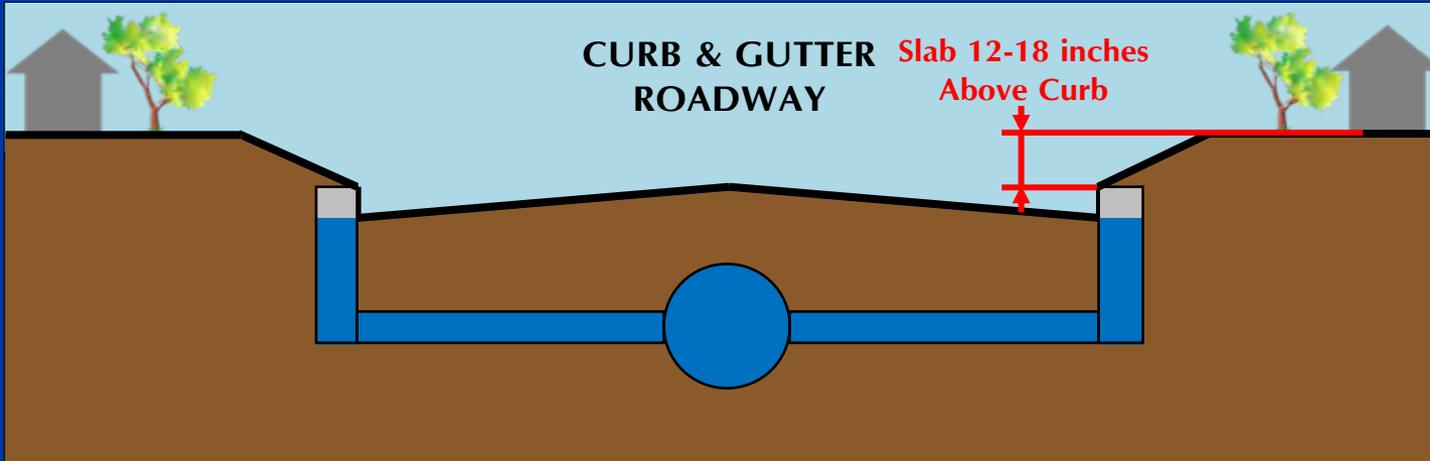


Low Slab Elevations



10/15/2009

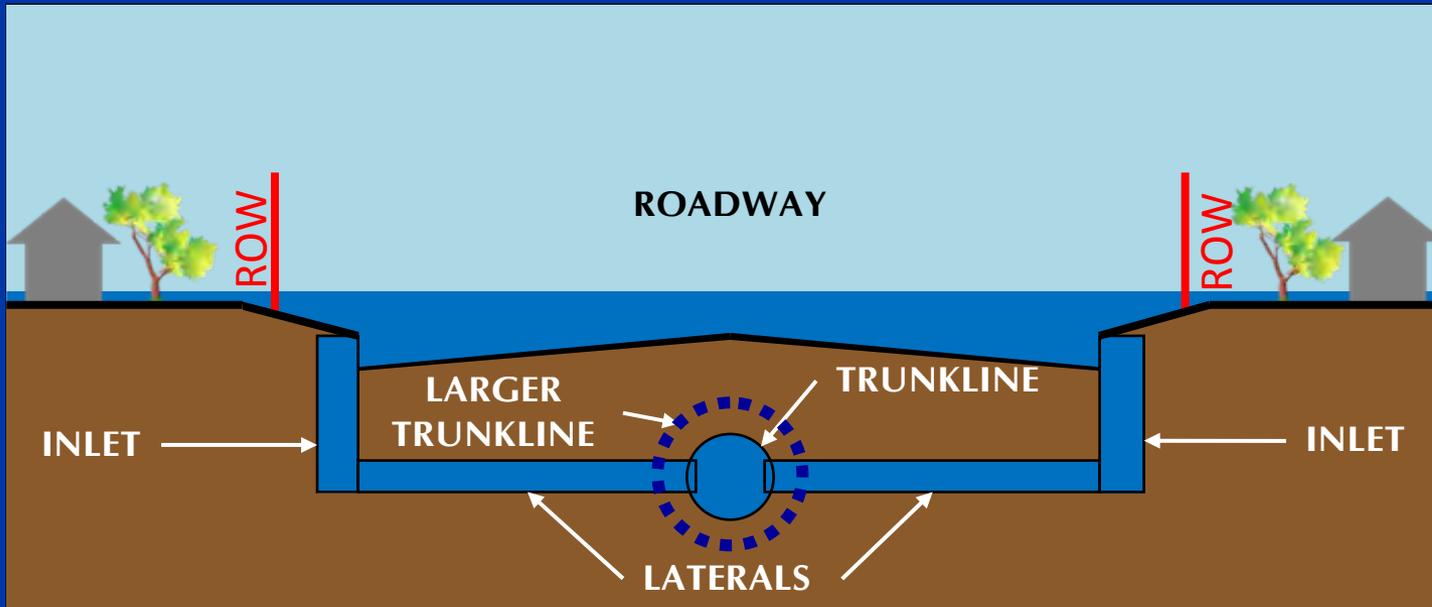
Low Slab Elevations



10/15/2009

Older/Smaller Storm Sewers

April 28th, Event
Summary



10/15/2009

Overland Flow Problems & Excessive Ponding

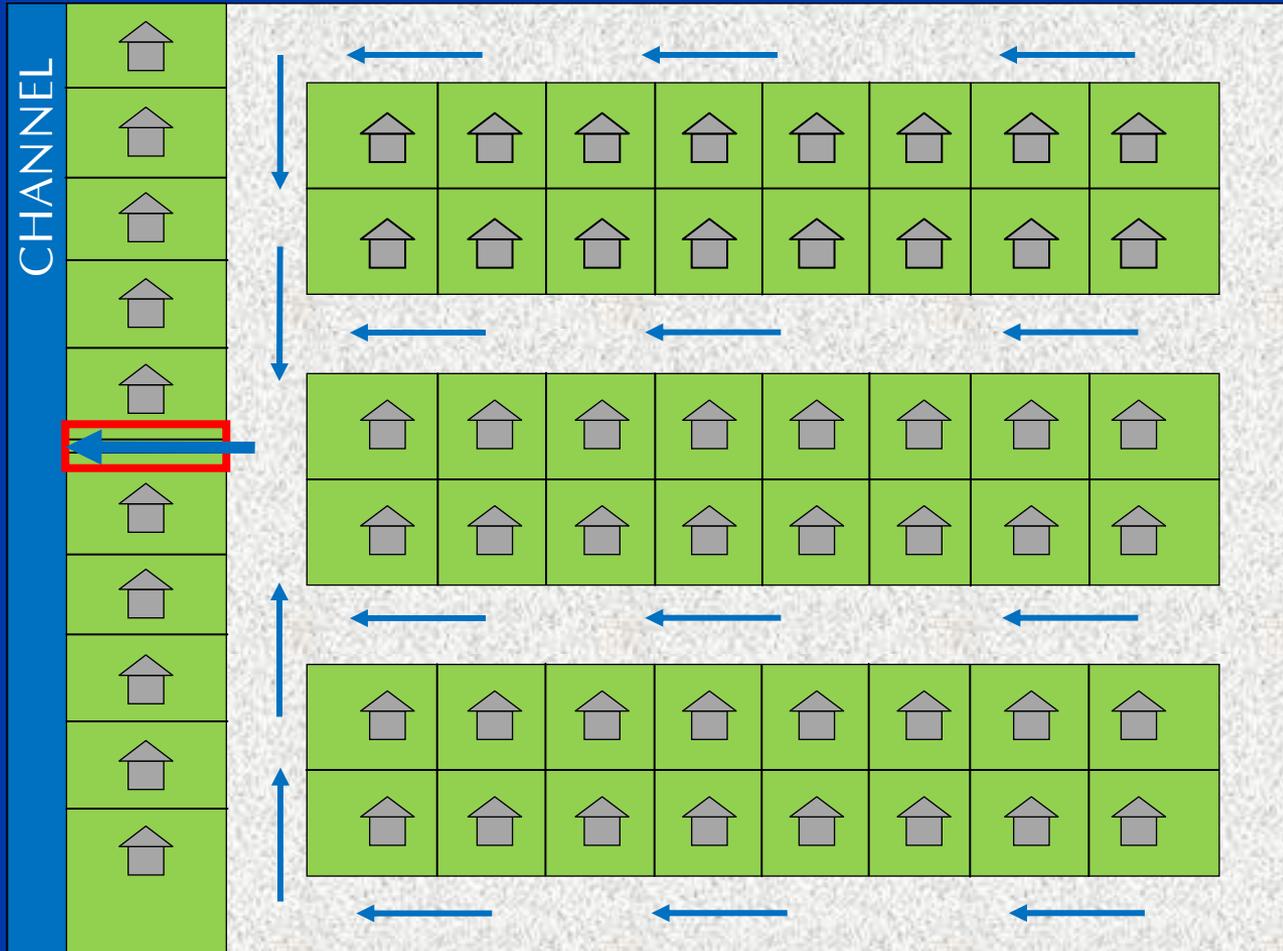
April 28th, Event Summary



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Overland Flow Solutions

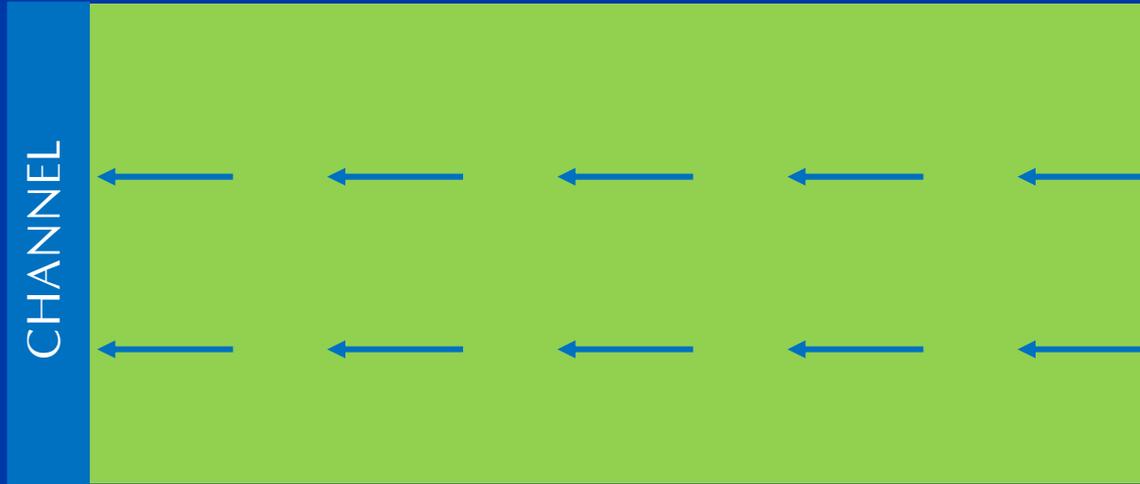
April 28th, Event
Summary



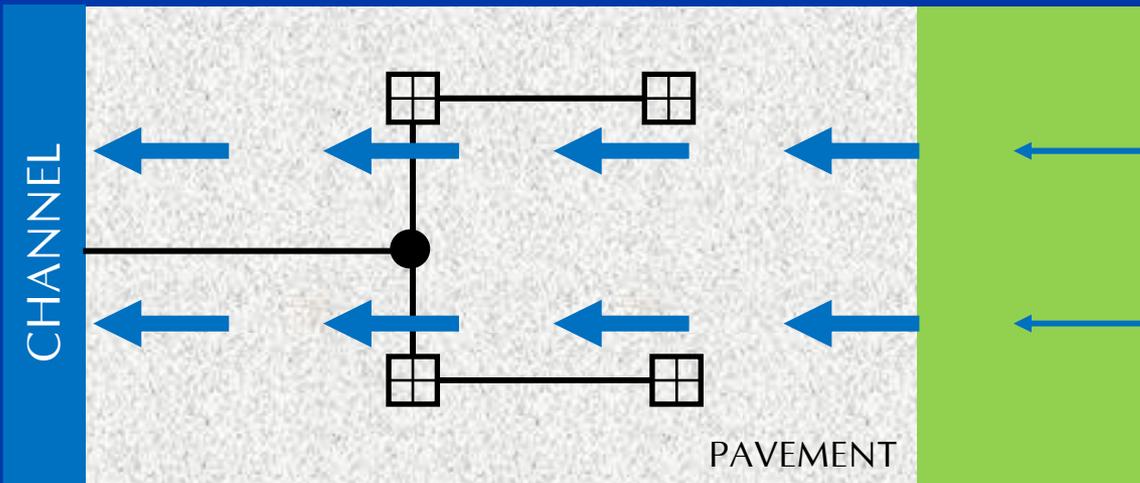
10/15/2009

Insufficient Detention

UNDEVELOPED GRASS



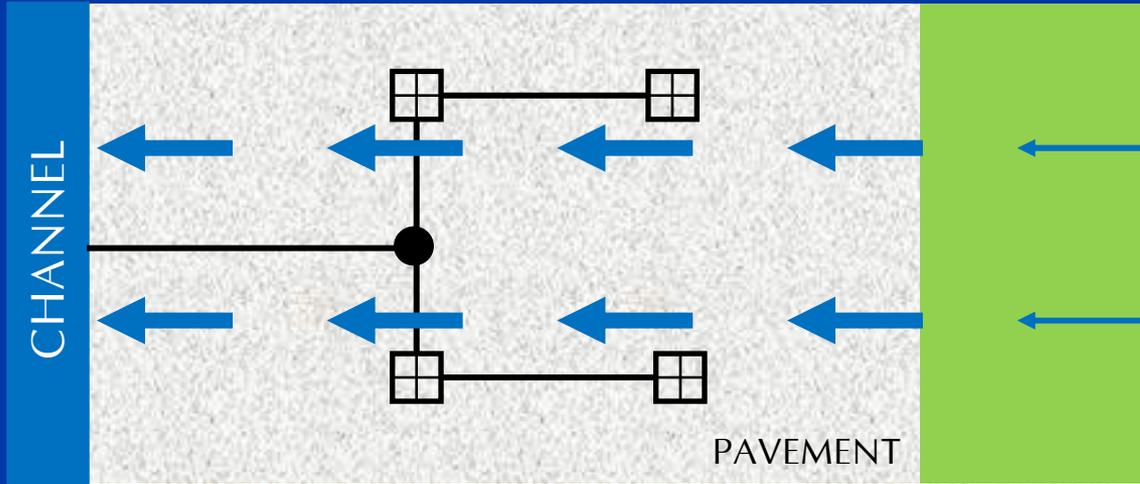
DEVELOPMENT WITHOUT DETENTION



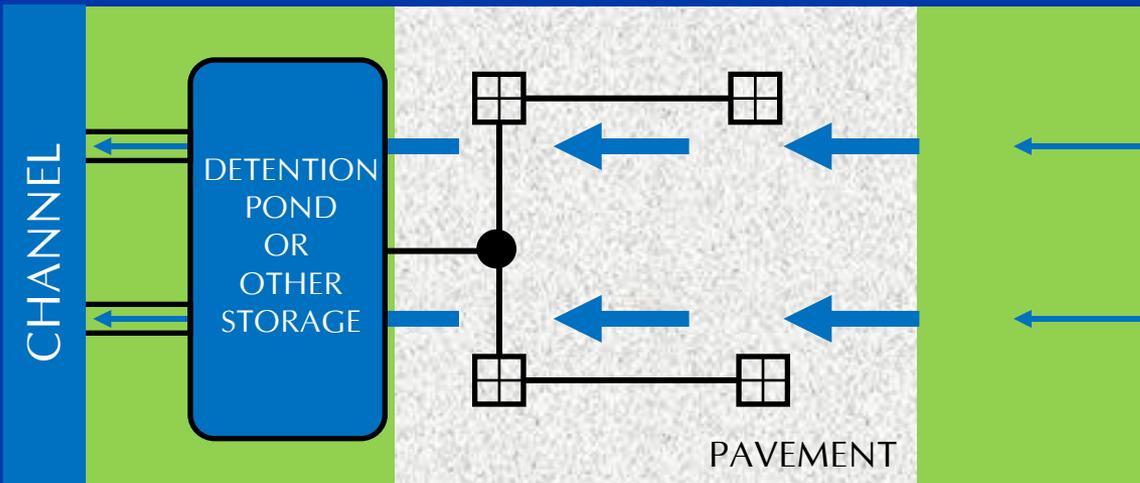
10/15/2009

Benefits of Detention

DEVELOPMENT WITHOUT DETENTION



DEVELOPMENT WITH DETENTION



10/15/2009

Flooding Causes

April 28th, Event
Summary

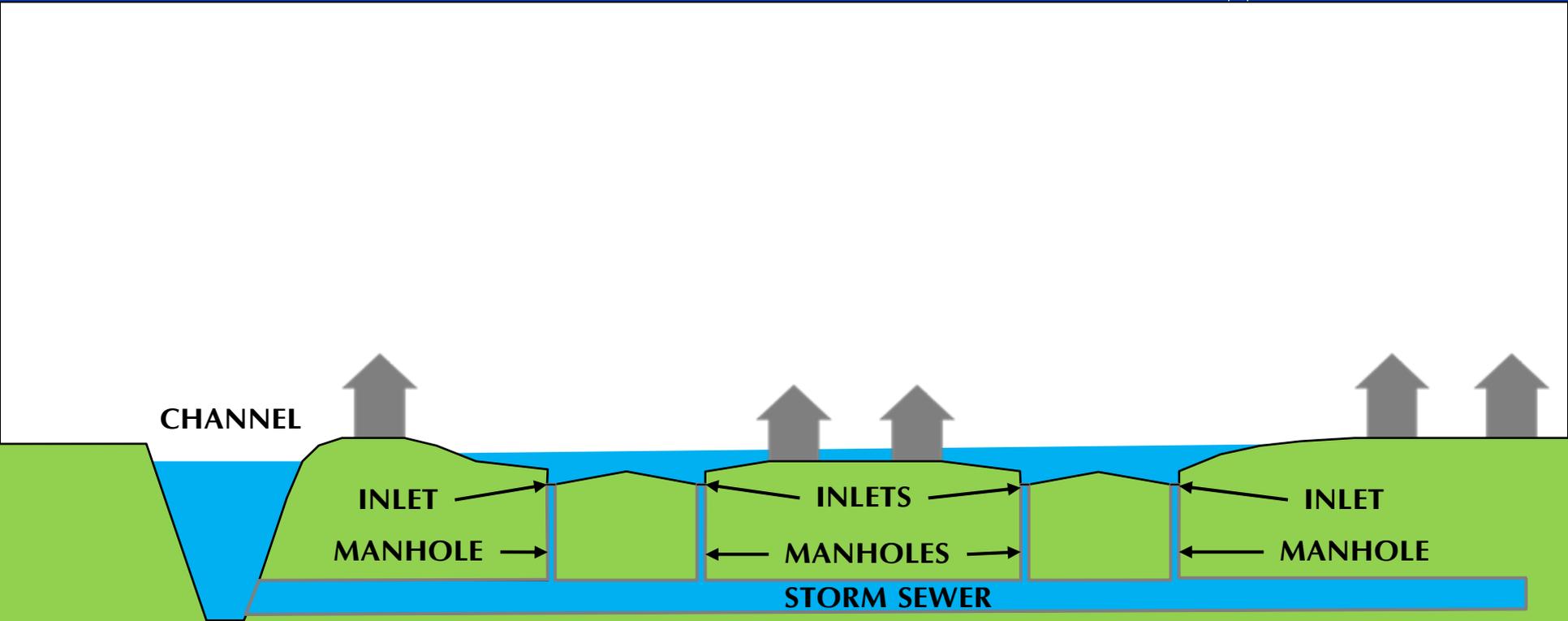
| | Development Criteria (1950's-1970's) | Resulting Issues | Current Criteria |
|---|--|---|---|
| Low Lying Community Relative to Chan. Banks | N/A | No Overland Flow Outfalls | N/A |
| Slab Elevation | No Standard | Frequent Home Flooding | 12-18 inches Above Curb |
| Storm Sewer or Roadside Ditch Size | Smaller | Frequent Street Flooding | Larger |
| Overland Flow | No Requirement | Excessive Ponding in Low Lying Developed Areas | Defined Path Maintained Within ROW |
| Detention | No Requirement for Residential or Commercial | Increased Runoff from Residential and Commercial | Required for Residential and Commercial |

10/15/2009



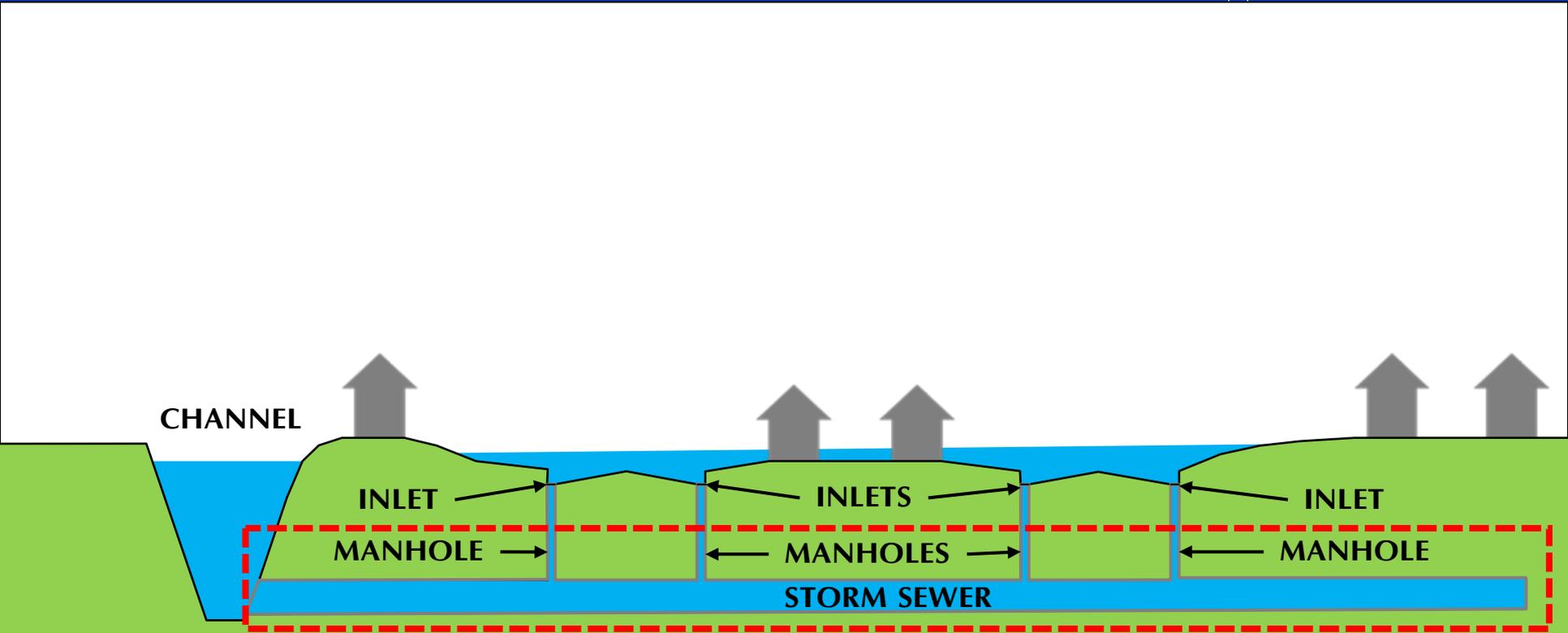
Common Flooding Situation

April 28th, Event
Summary



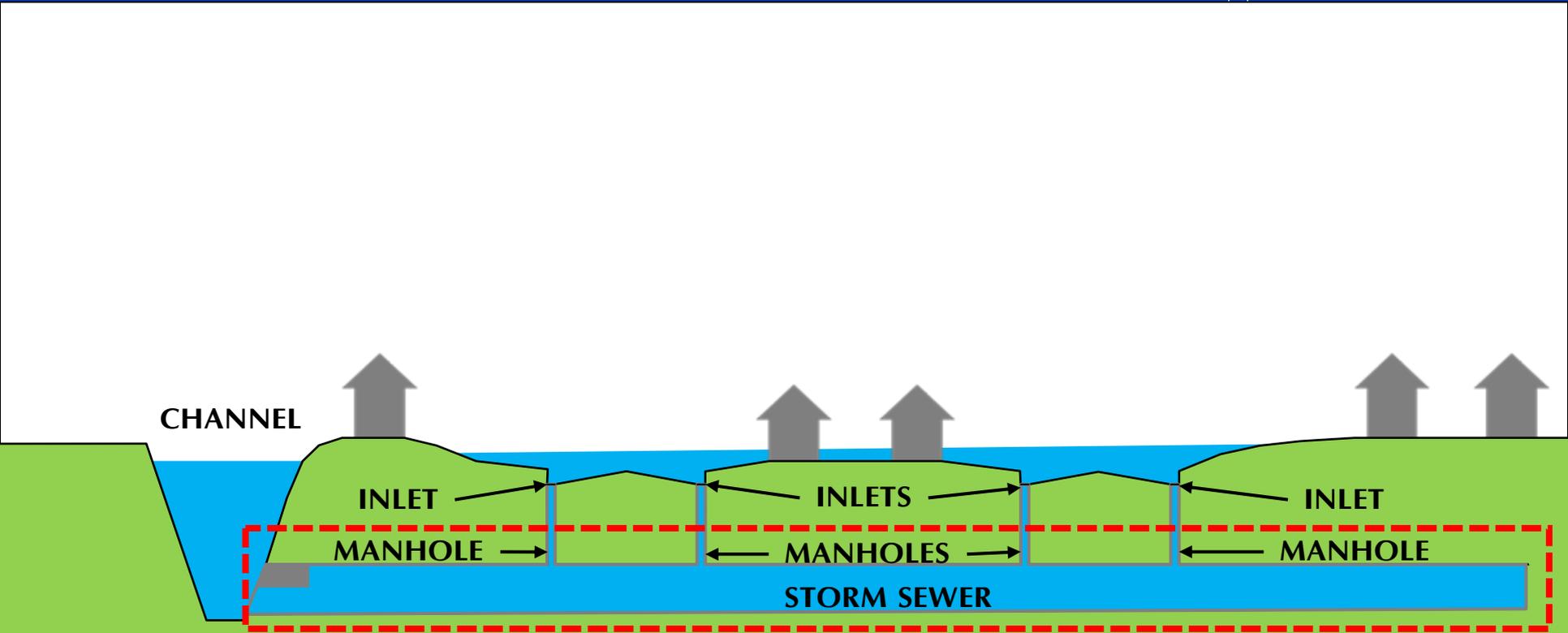
Storm Sewer Improvements

April 28th, Event
Summary



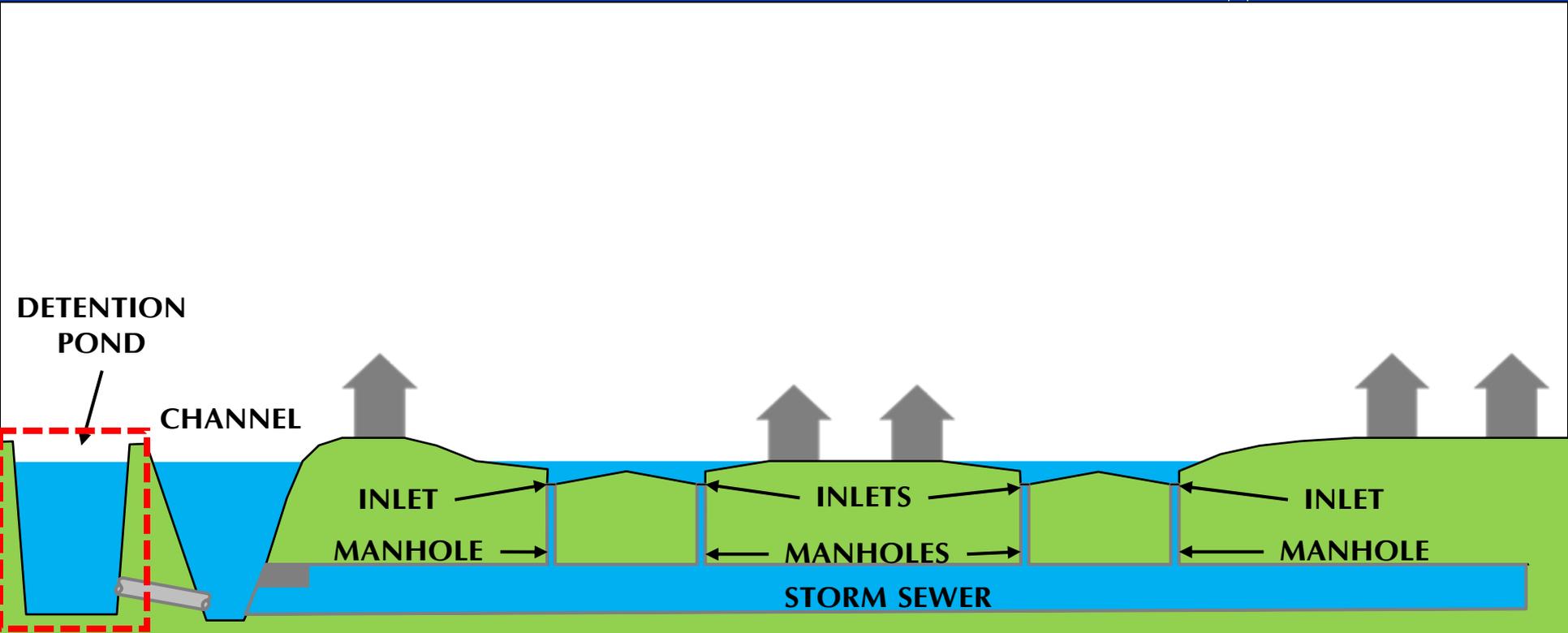
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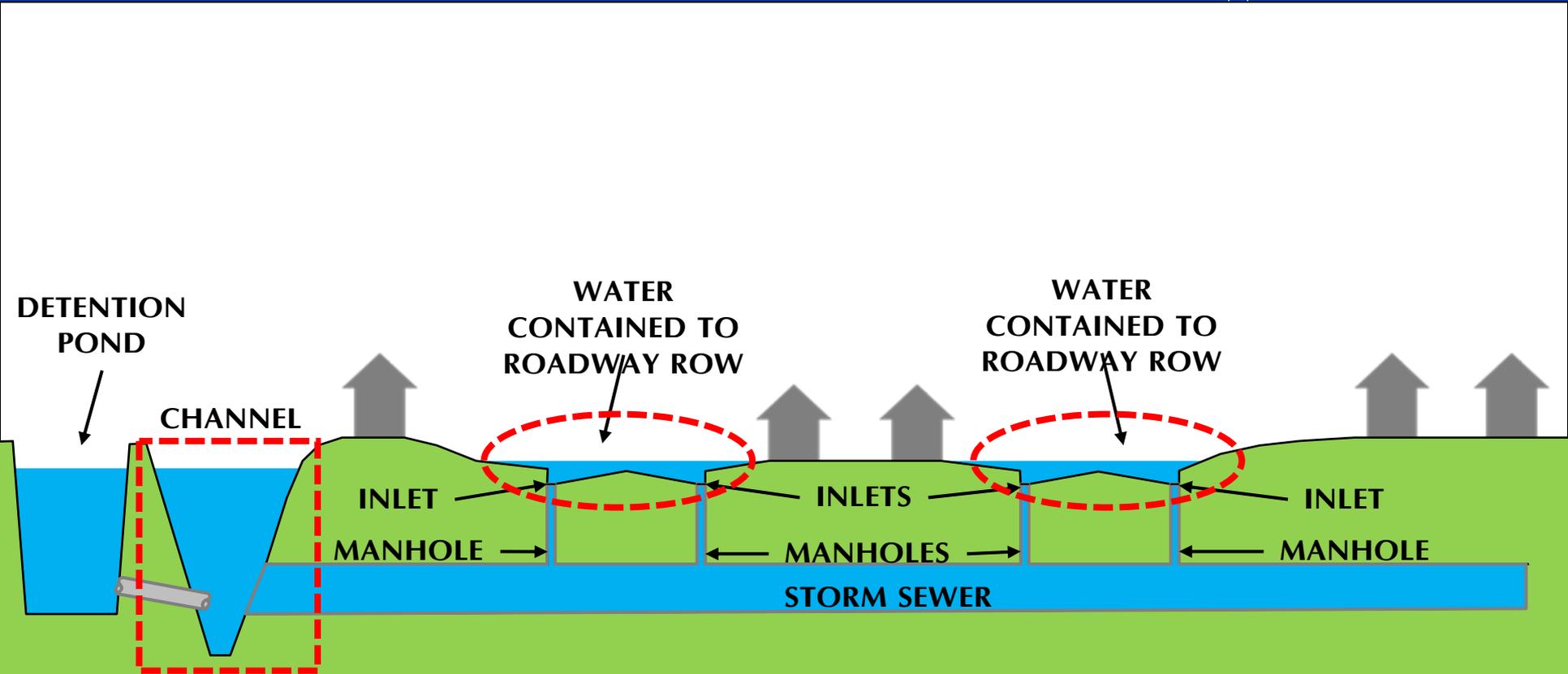
Addition of Detention Pond

April 28th, Event
Summary



Channel Improvements

April 28th, Event
Summary



- **Conveyance**
 - Move More Water from Community to Channel
- **Detention**
 - Cannot Cause Downstream Impacts
- **Channel Improvements**
 - Lowers Water Surface Elevation

10/15/2009

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10/15/2009



TIRZ 17 Drainage Initiatives: Past, Present, and Future

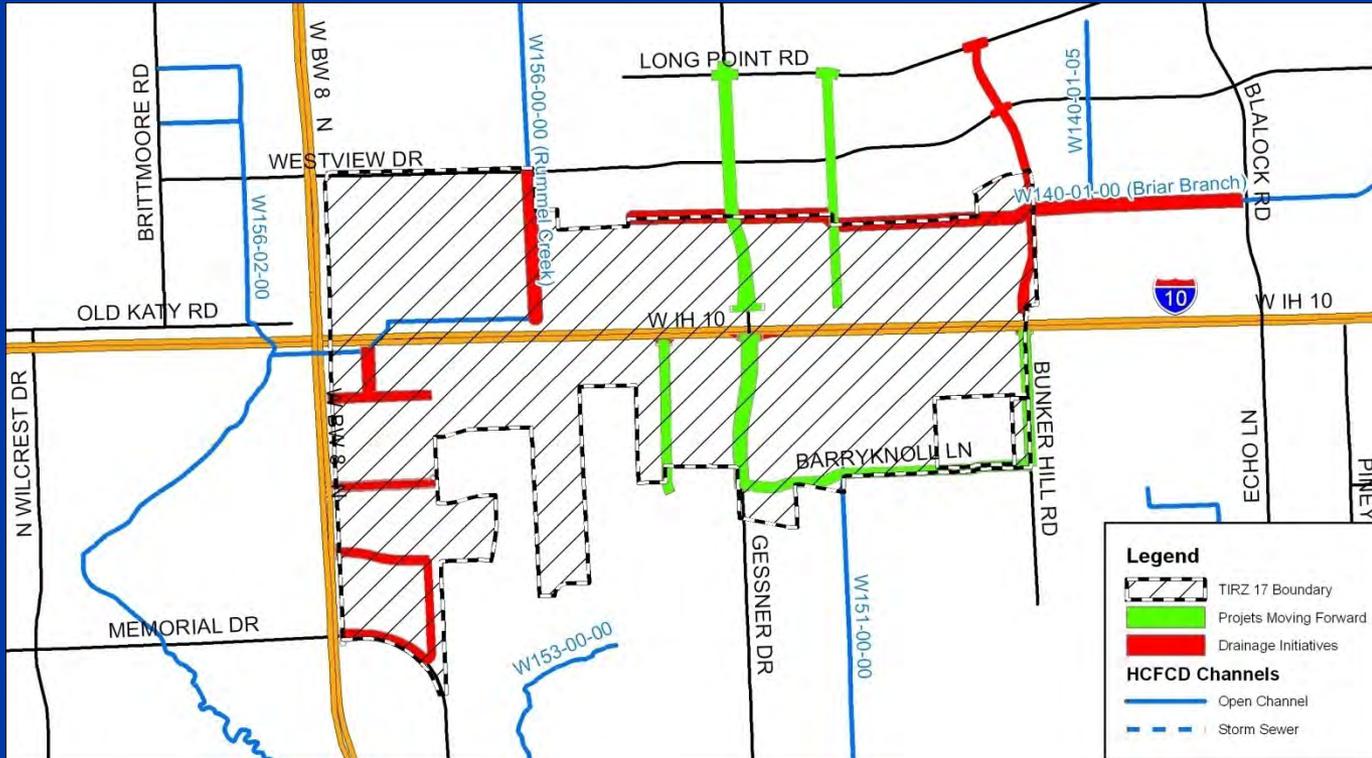
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TIRZ 17 – Drainage Initiatives

TIRZ 17 Drainage Initiatives



10/15/2009

Gessner Road Widening

TIRZ 17 Drainage Initiatives



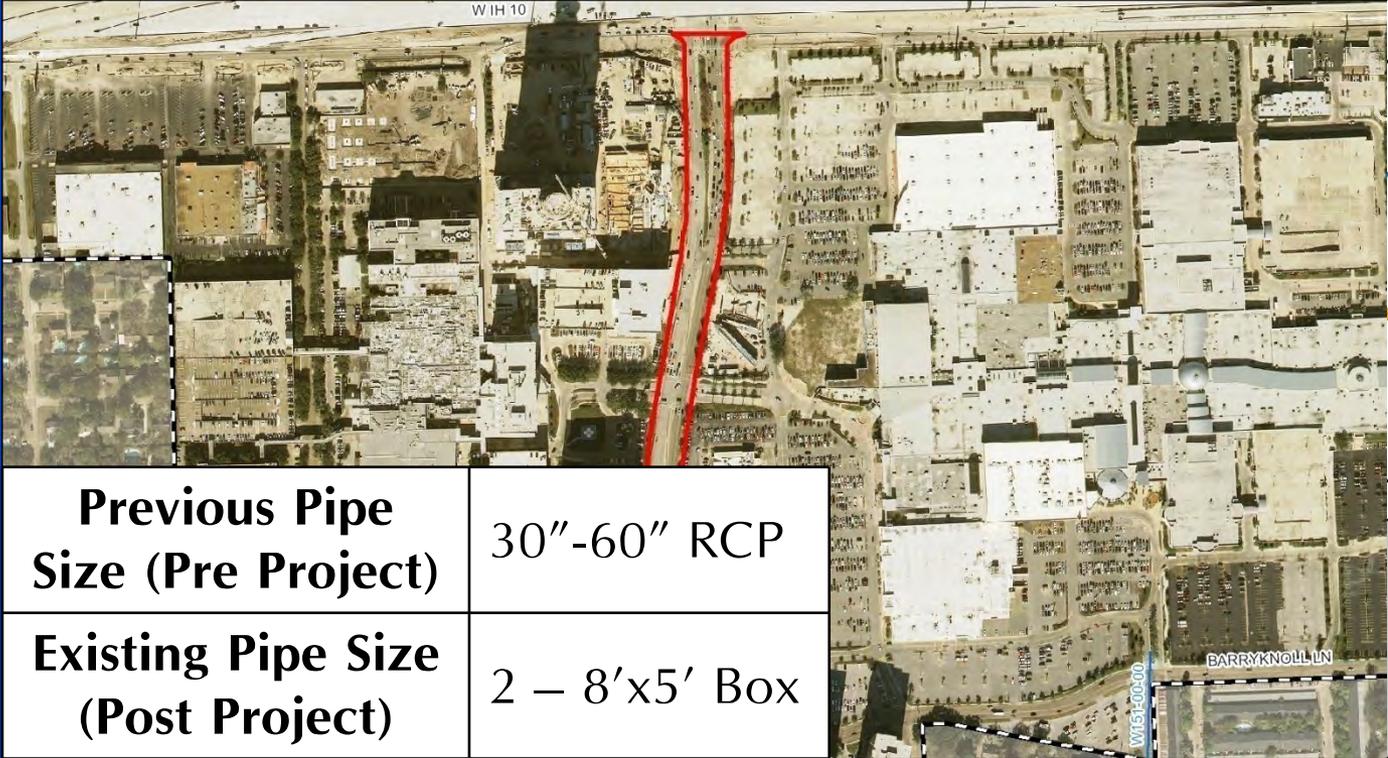
10/15/2009



Gessner Road Widening

Construction Cost
\$11,205,306

Schedule
Eng.: Complete, Const.: 11-09



| | |
|--|---------------|
| Previous Pipe Size (Pre Project) | 30"-60" RCP |
| Existing Pipe Size (Post Project) | 2 – 8'x5' Box |

10/15/2009

Gessner Road Widening Result

■ Purpose

- Increased Level of Service
- Decrease Frequency & Volume of Overflows to Adjacent Neighborhoods

■ Current Benefit

- Increased Level of Service from <2-year to 5-year
- Reduced Overflows from Gessner Road
- Provided Storage
- During April 28th Event All 3 Benefits Realized

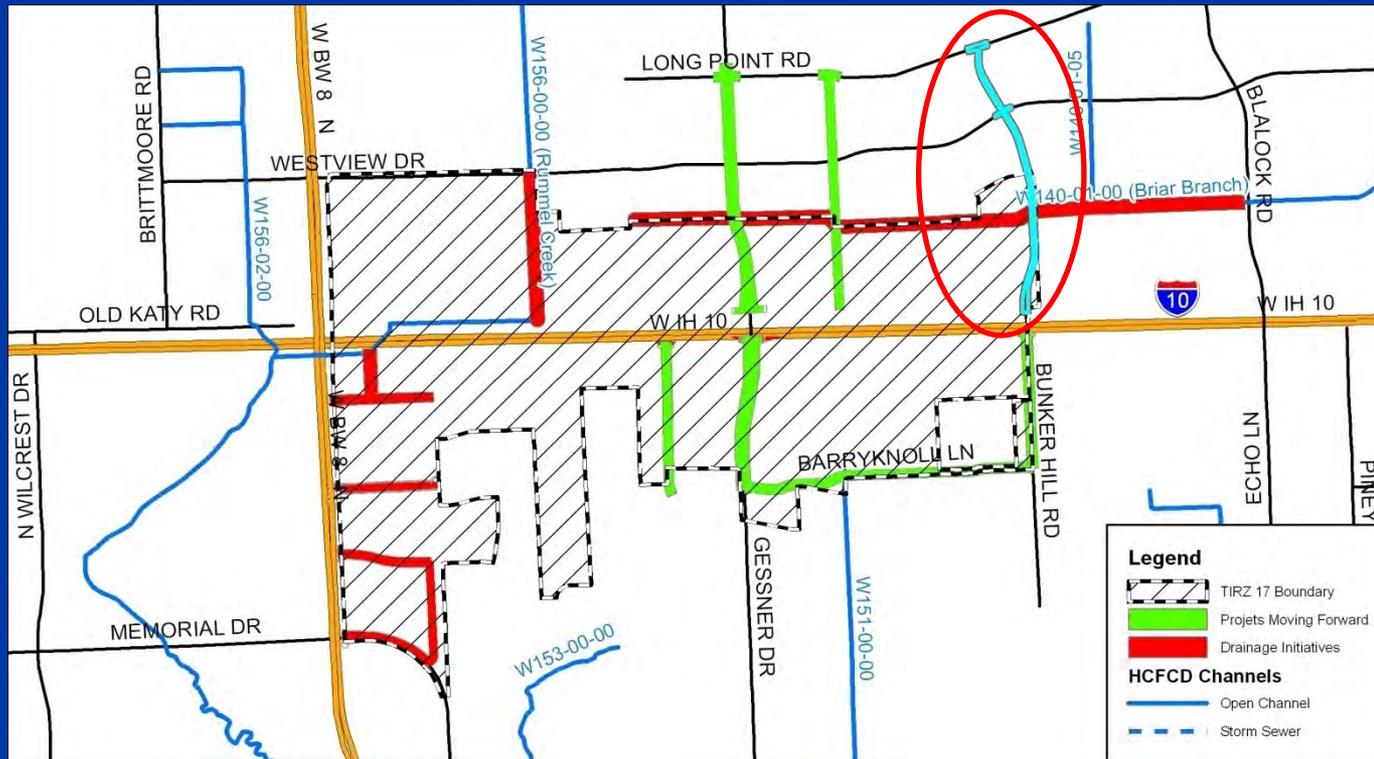
■ Post W151 Improvement Benefit

- Aligns with HCFCD W151 Study
- Reduced Cost of Future Improvements

10/15/2009

Bunker Hill Widening

TIRZ 17 Drainage Initiatives



10/15/2009



Bunker Hill Widening

Construction Cost
\$7,266,987

Schedule
Eng.: Complete, Const.: 10-09



10/15/2009

Bunker Hill Widening Result

- **Purpose**

- Increase Mobility
- Improve Drainage

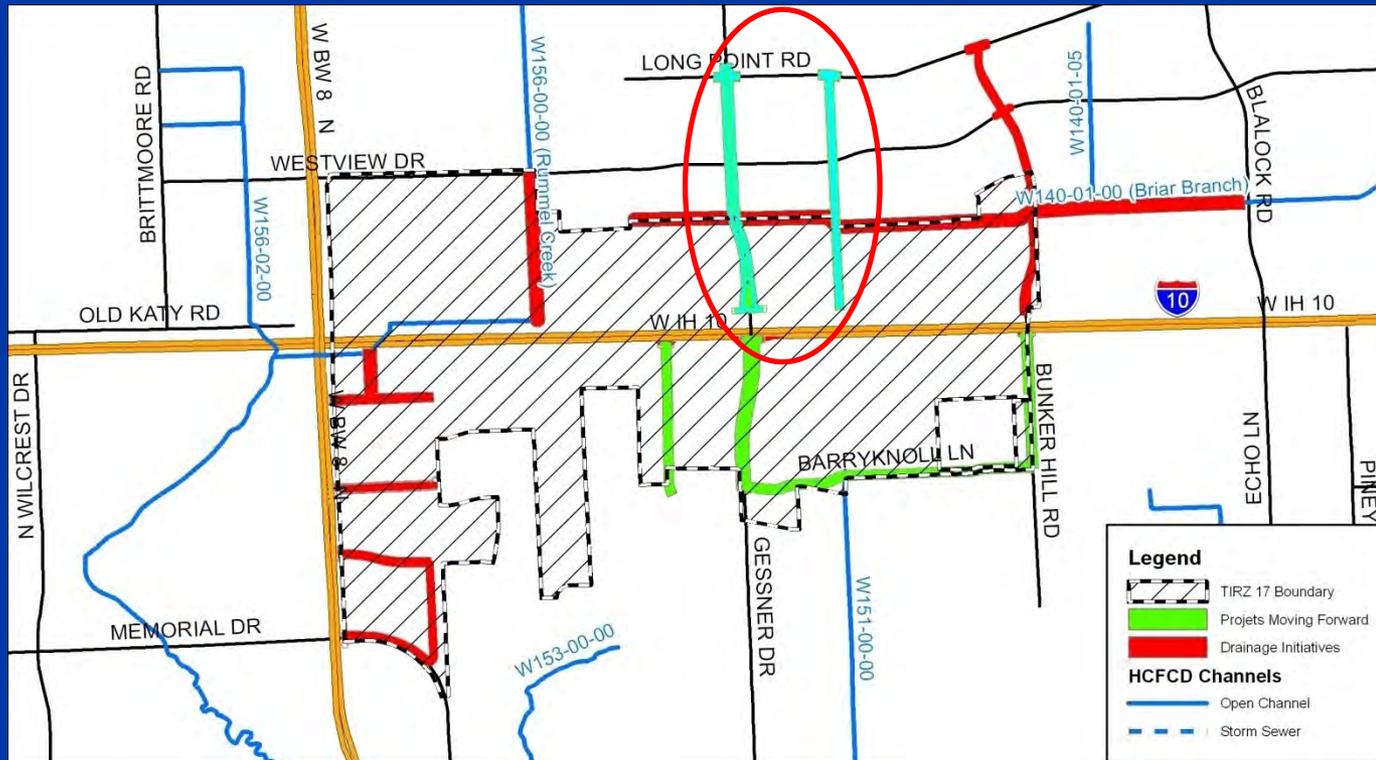
- **Current Benefit**

- Increased Level of Service
- Increased Roadway Storage
- Decreased Street Ponding / Flooding
 - Decreased Ponding on Pine Lake
- During April 28th Event – Improvements Had Marginal Impact – The System Was Overwhelmed

10/15/2009

North Gessner Mobility and Drainage Improvements

TIRZ 17
Drainage
Initiatives



10/15/2009



North Gessner Mobility and Drainage Improvements

TIRZ 17
Drainage
Initiatives

Estimated Construction Cost
\$7,307,000

Schedule
Eng.: Ongoing, Const.: Mid 2011



10/15/2009

North Gessner Road Mobility and Drainage Improvements Result

- **Purpose**

- Increased Storm Sewer Level of Service
- Improve Mobility

- **Anticipated Benefit**

- Decreased Ponding / Localized Flooding
- Enhanced Mobility
- Improved Safety

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Barryknoll Drainage Improvements

TIRZ 17 Drainage Initiatives



10/15/2009

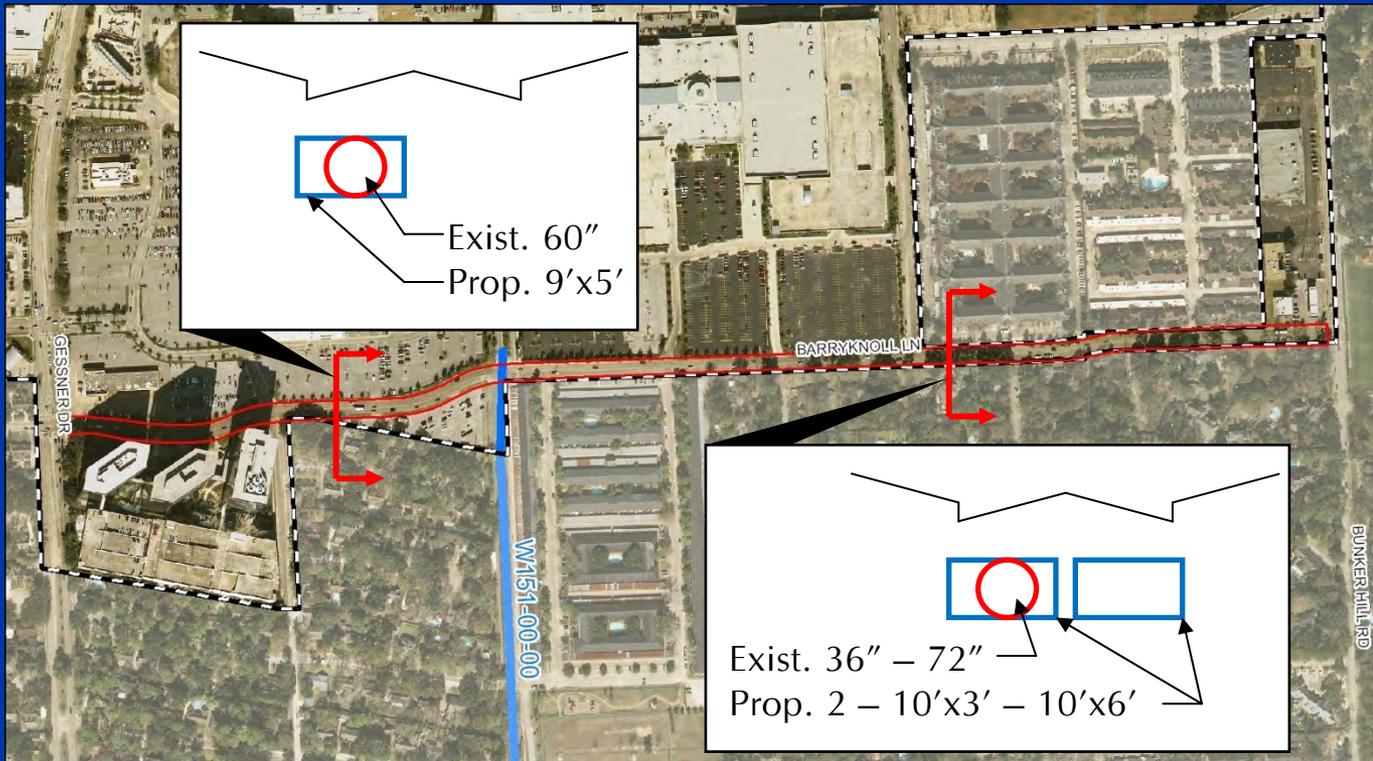
Barryknoll Drainage Improvements

Estimated Construction Cost

\$5,387,886

Schedule

Eng.: Ongoing, Const.: Spring 2011



Proposed Pipes
Are 2.3 – 8.5
Times Bigger
Than Existing

10/15/2009

Barryknoll Drainage Improvements Future Results

- **Purpose**

- Upgrade Existing Drainage Infrastructure
- Install Components of W151 Improvements

- **Pre W151 Improvement Benefits**

- Provide Over 10 ac-ft of Detention
- Increase Storm Sewer Level of Service
- Reduce Overland Flow to Adjacent Area

- **Post W151 Improvement Benefits**

- Provide Conveyance to Improved Channel

10/15/2009

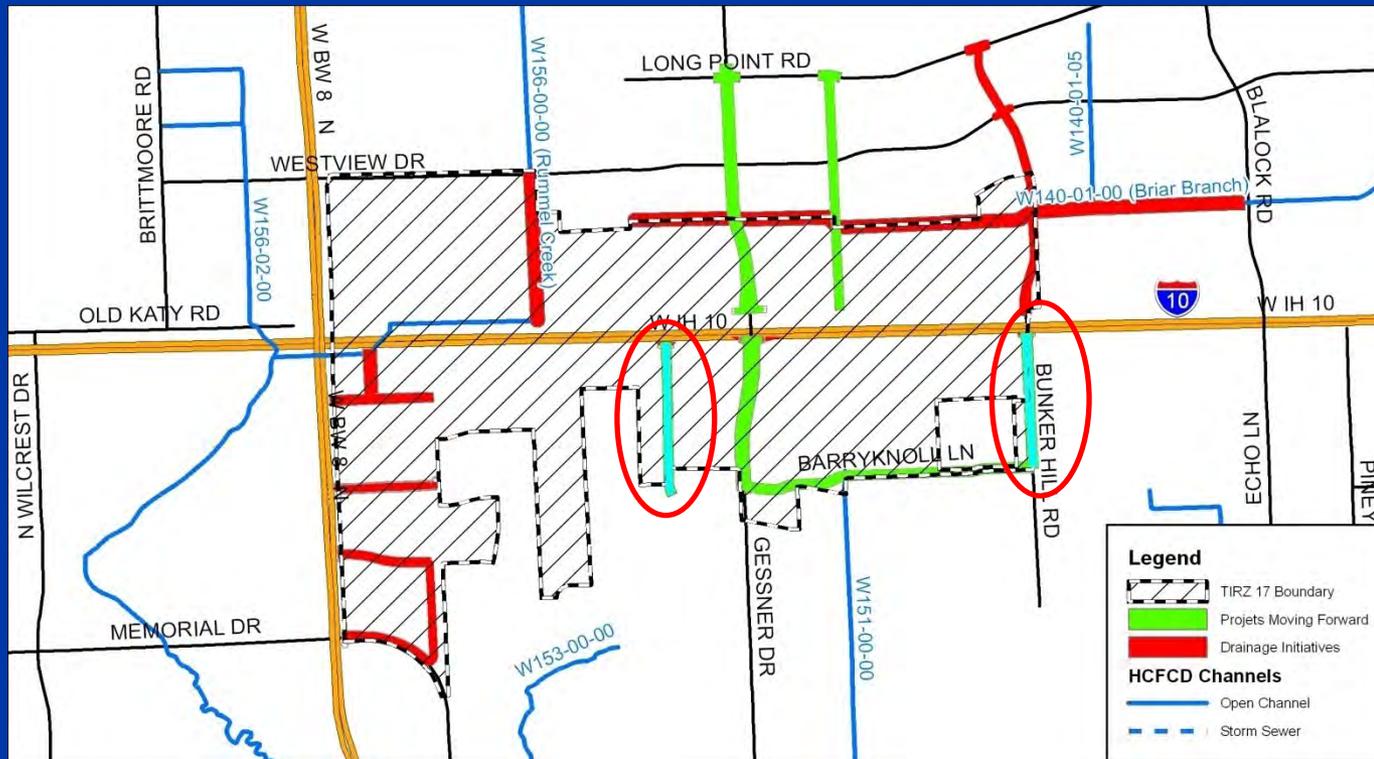
Future Drainage Initiatives

TIRZ 17
Drainage
Initiatives

Bunker Hill South - Est. Const. Cost: \$2,234,000

Frostwood Drive - Est. Const. Cost: \$2,534,000

Schedule: Engineering: FY 2011, Construction: FY 2012



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Future Drainage Initiatives Results

- **Purpose**
 - Increase Storm Sewer Level of Service
- **Benefits**
 - Decreased Ponding / Localized Flooding

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■ Major Objectives

- Identify Viable and Effective Means to Lower Water Surface Elevations Within Study Area
- Develop Implementation Plan

■ Study Limitations

- General Analysis of Areas North of IH-10
- No Overland Flow Analysis

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What is Still Needed?

- **Detailed Analysis North of IH-10**
- **Overland Flow Analysis**
- **Comprehensive Regional Analysis**
- **Determine System Level-of-Service**
- **Further Document Problem Areas**
- **Identify Regional Solutions**
 - Each Project Effects Other Projects
- **Project Prioritization**

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Why Perform the Study Now?

- **Builds on W151 Implementation Study Effort**
- **Leverage Benefits of HCFCDD Study**
- **Maximize Benefit of Proposed TIRZ 17 CIP**

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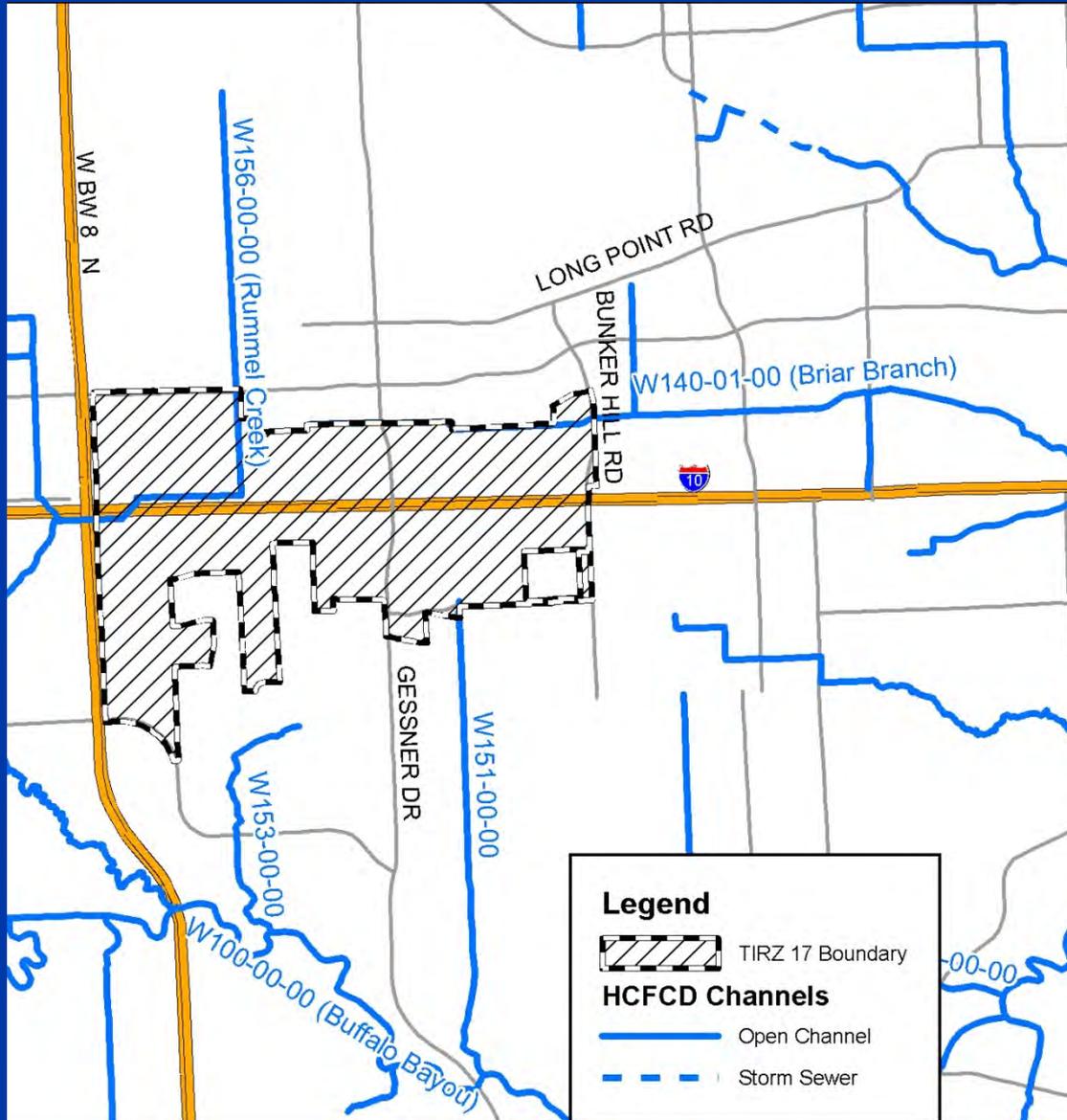
Summary of Study Differences

| Study Item | HCFCW W151 Study | TIRZ 17 Regional Drainage Study |
|---|------------------|---------------------------------|
| Develop Base Line Model | ■ | |
| Identify Primary Flooding Causes | ■ | |
| Define Improvement Alternatives | ■ | + |
| Study Area South of IH-10 | ■ | + |
| Study Area North of IH-10 | | ■ |
| Detailed Overland Flow Analysis | | ■ |
| Identify Secondary Flooding Causes | | ■ |
| Identify Detailed System Level of Service | | ■ |
| Evaluate Benefit of CIP Projects | | ■ |
| Prioritize Improvements - Schedule, Benefit, Cost | | ■ |

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TIRZ 17 Regional Drainage Study

TIRZ 17 Drainage Initiatives



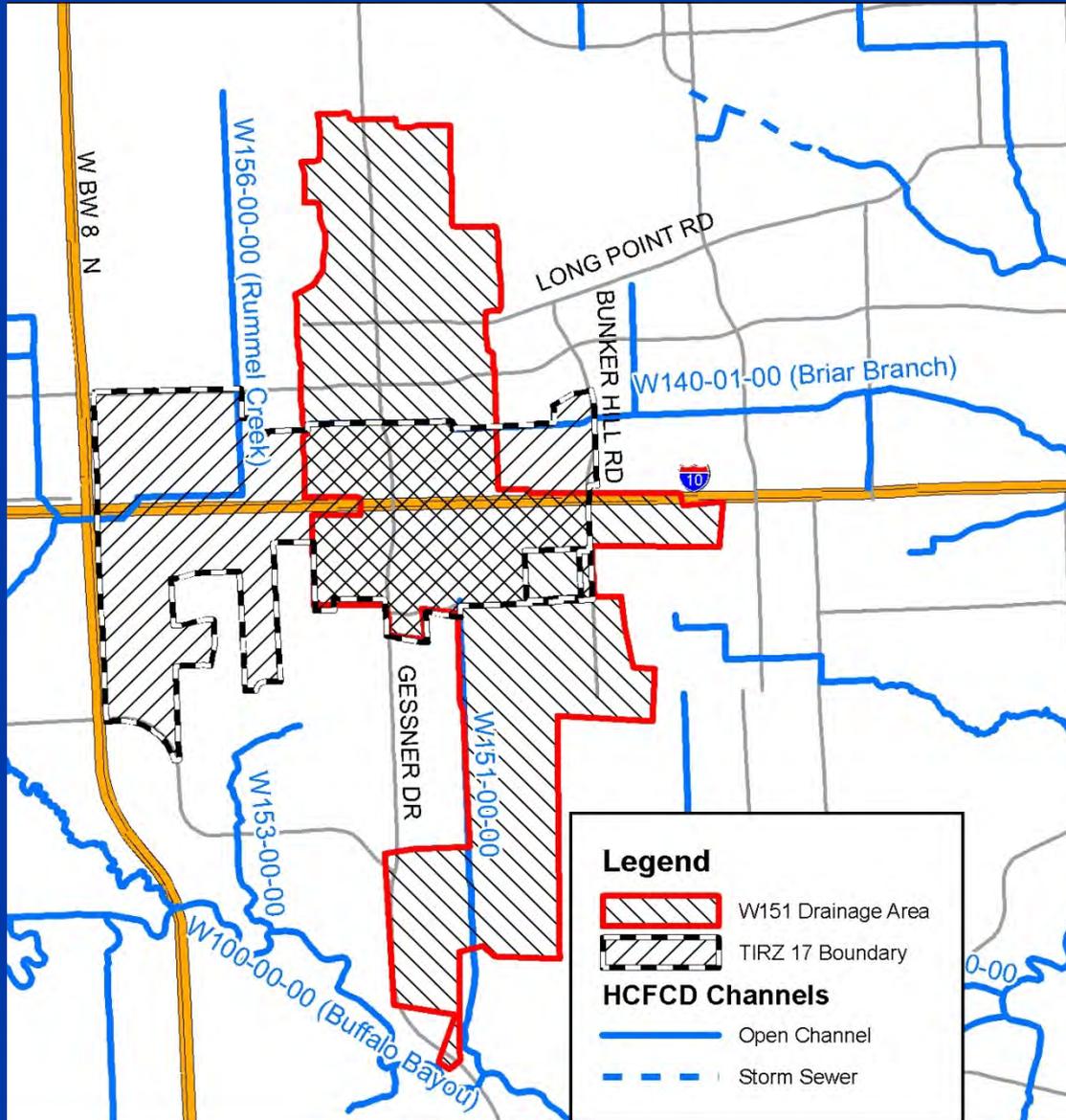
| | Approximate | | |
|---------|-------------|---------------|------------|
| | Area (Ac.) | Overlap (Ac.) | % of Whole |
| TIRZ 17 | 988 | | |
| W151 | | | |

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TIRZ 17 Regional Drainage Study

TIRZ 17 Drainage Initiatives



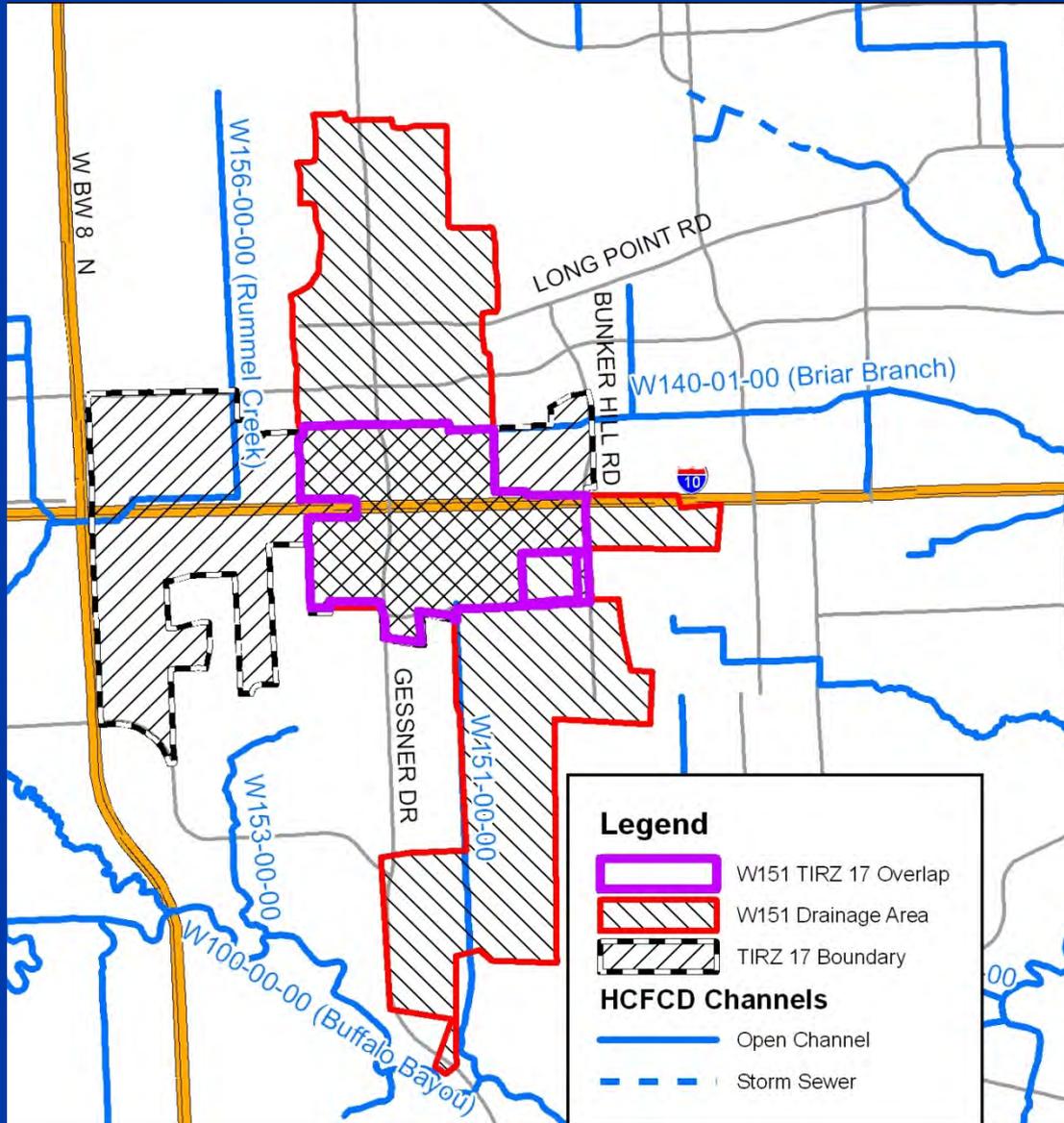
| | Approximate | | |
|---------|-------------|---------------|------------|
| | Area (Ac.) | Overlap (Ac.) | % of Whole |
| TIRZ 17 | 988 | | |
| W151 | 1454 | | |

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TIRZ 17 Regional Drainage Study

TIRZ 17 Drainage Initiatives

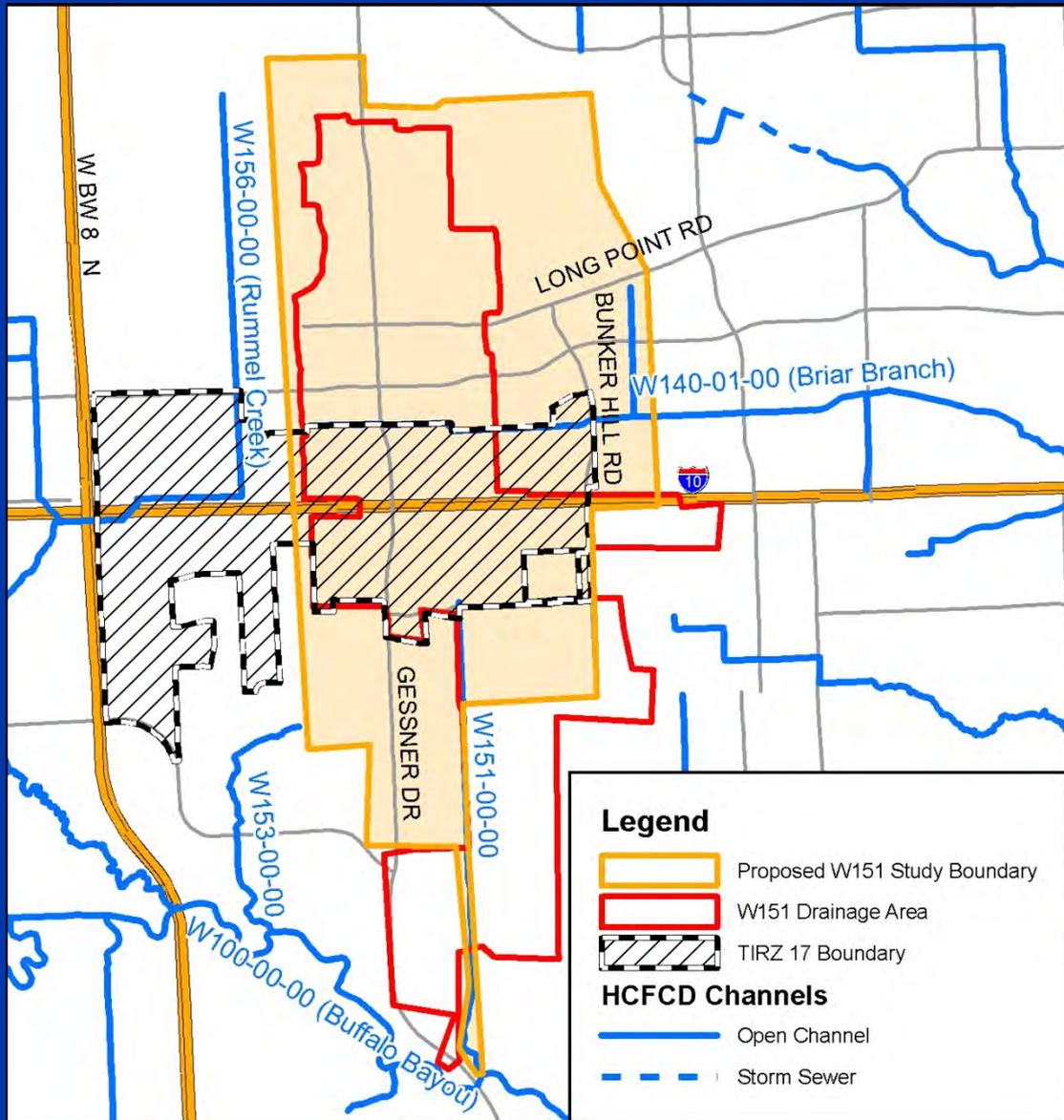


| | Approximate | | |
|---------|-------------|---------------|------------|
| | Area (Ac.) | Overlap (Ac.) | % of Whole |
| TIRZ 17 | 988 | 383 | 39 |
| W151 | 1454 | 383 | 26 |

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TIRZ 17 Regional Drainage Study



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- **TIRZ 17 is Working to Improve Drainage in the Area**
- **Capital Improvement Plan Adjusted Based on April 28th Event**
 - Advanced Drainage Improvement Projects
- **Undertaking Comprehensive Regional Drainage Study**
- **Maximize CIP Funds for Drainage Projects**
- **Project Prioritization to Best Use Funds**

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**Information Open House in the
Commons Following This Presentation**
