

# CITY OF WACO STORM WATER MASTER PLAN

June 2, 2020



Why  
a  
Master Plan?

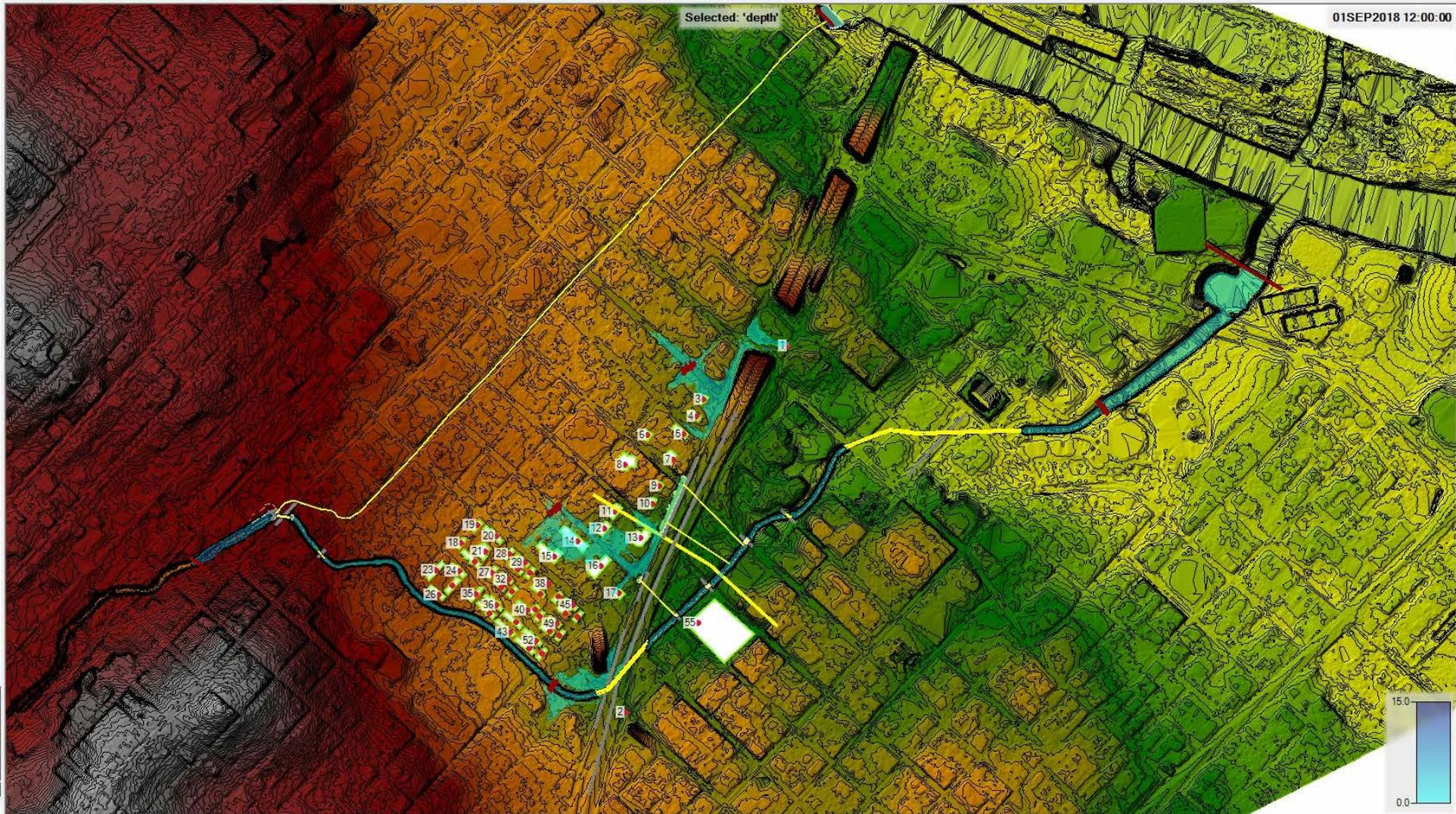


We must plan for the future, so it will not overwhelm us.”

--UNKNOWN



# Existing Flooding Conditions

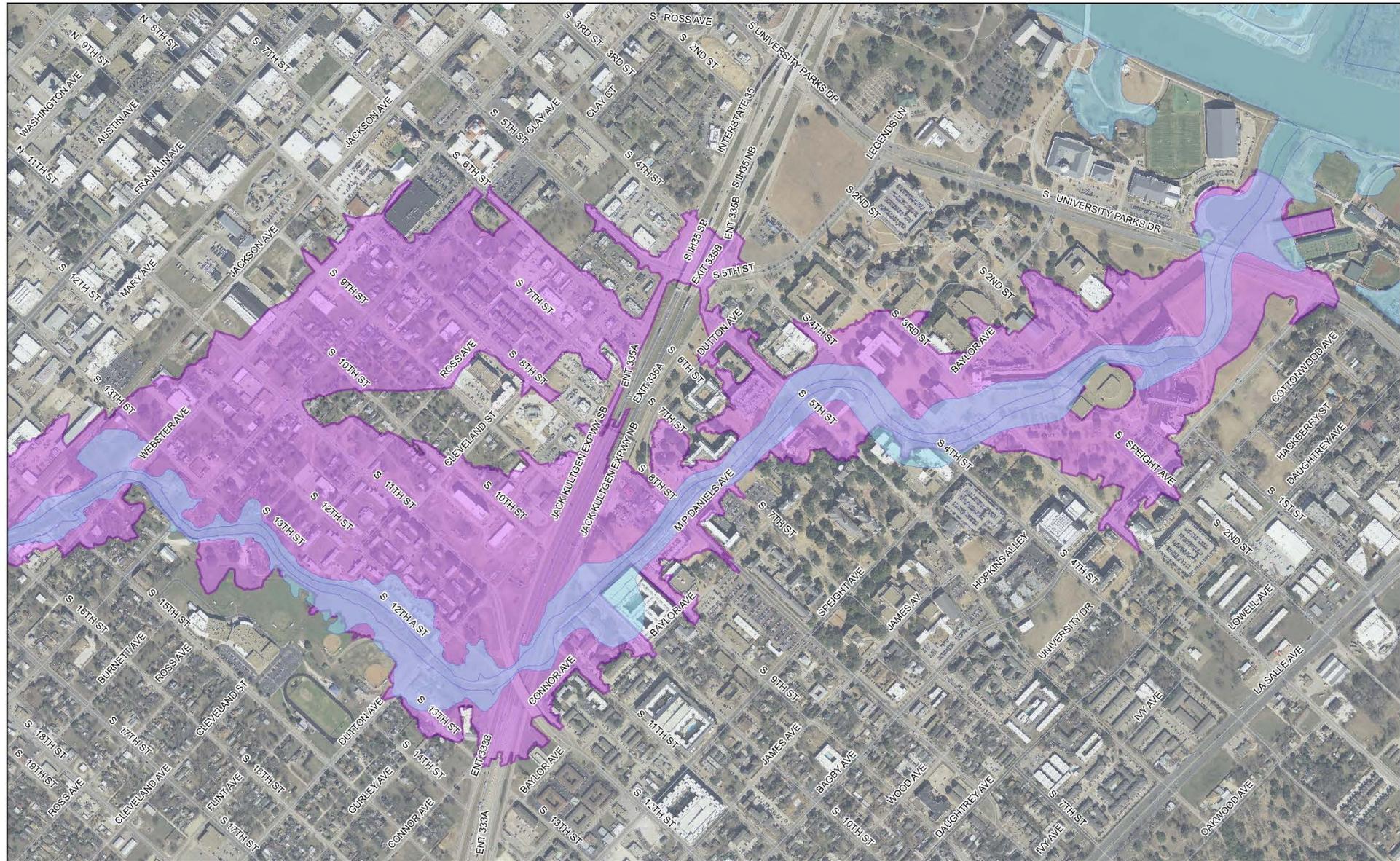


# Scenario Analysis

---



# Floodplain Comparison



# Goals

---

1. Mitigate the existing dangers of flooding
2. Protect the lives and property of citizens living and working in the City
3. Prevent future flood losses from occurring through sound, regional planning

How?

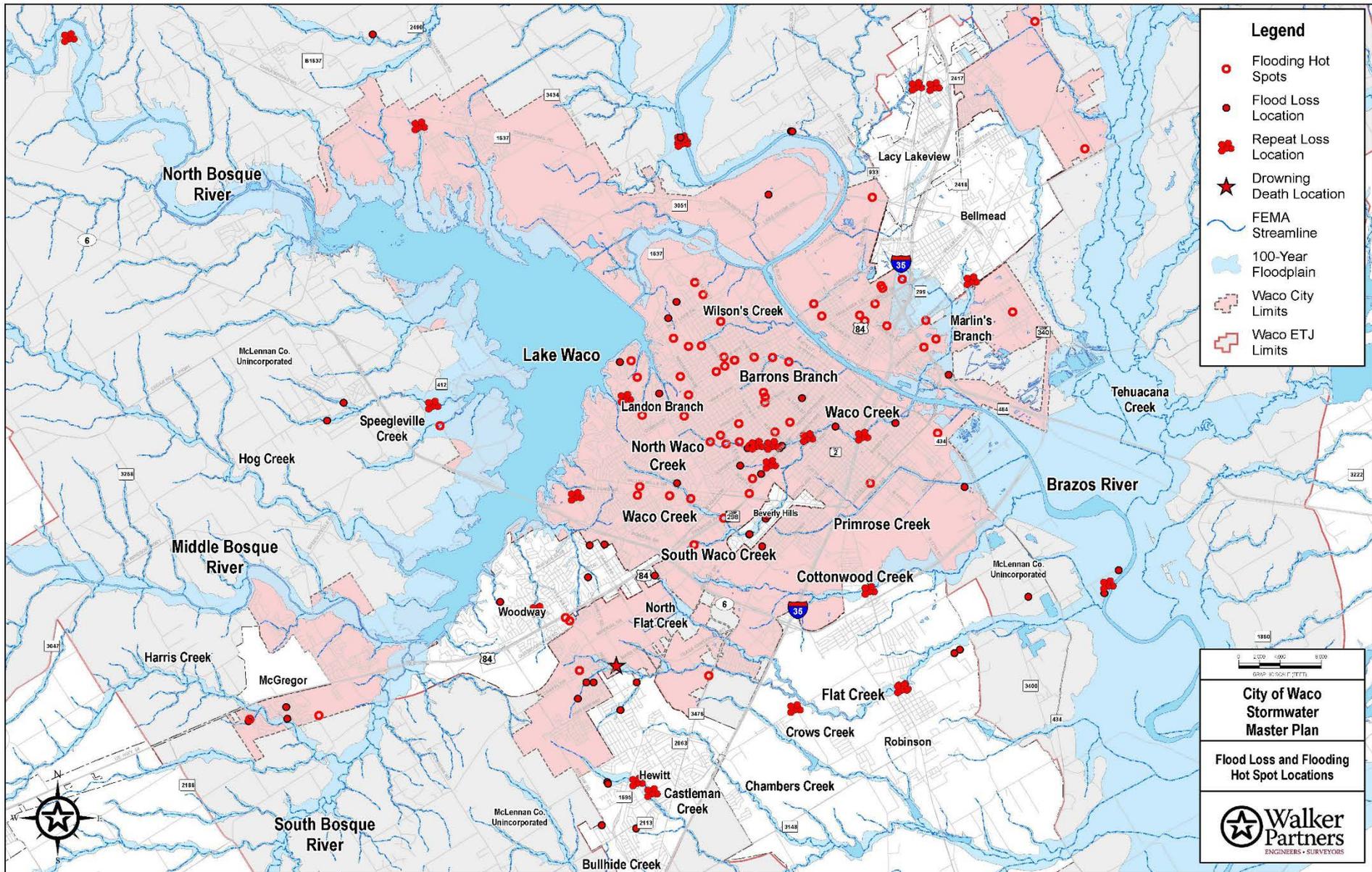
# Scope of Work

---

- Gather and record historical flooding information along major water courses within the City of Waco
- Analyze hydrology and hydraulics for the major water courses (including the Brazos River)
- Establish accurate mapping of the limits of the 100-year floodplains
- Secure approval from FEMA for the updated 100-year floodplain revisions
- Create regional floodplain regulations and drainage design criteria
- Recommend a Capital Improvement Program to plan and construct new improvement projects to protect the public
- Analyze funding options to implement the C.I.P.
- Develop a “DRAFT” Storm Water Utility Fee for consideration



# Flooding Hot Spots



CITY OF WACO, TEXAS  
ENGINEERING DEPARTMENT

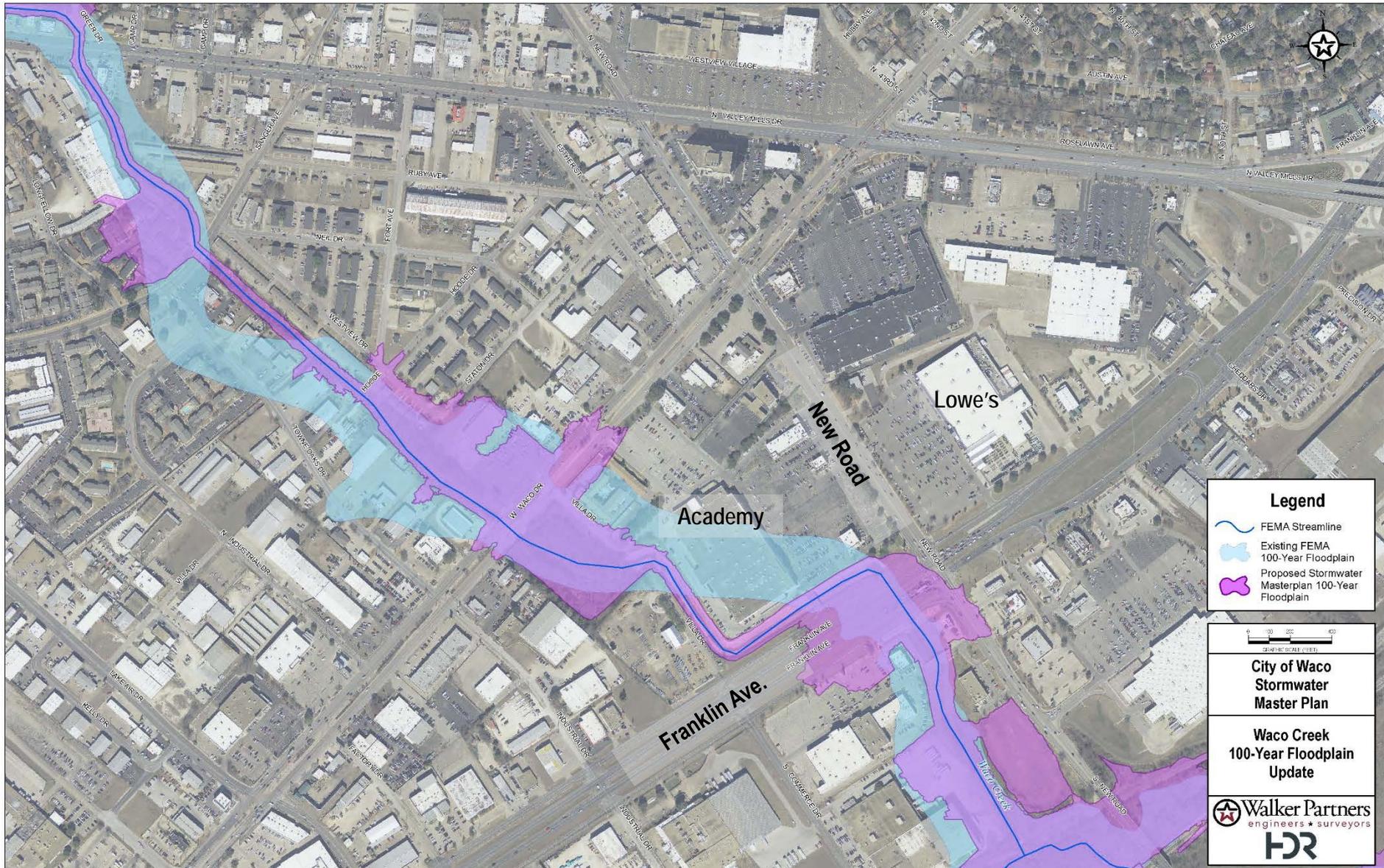
STORM DRAINAGE DESIGN MANUAL

FORREST AND COTTON, INC.  
CONSULTING ENGINEERS  
DALLAS, TEXAS

1959

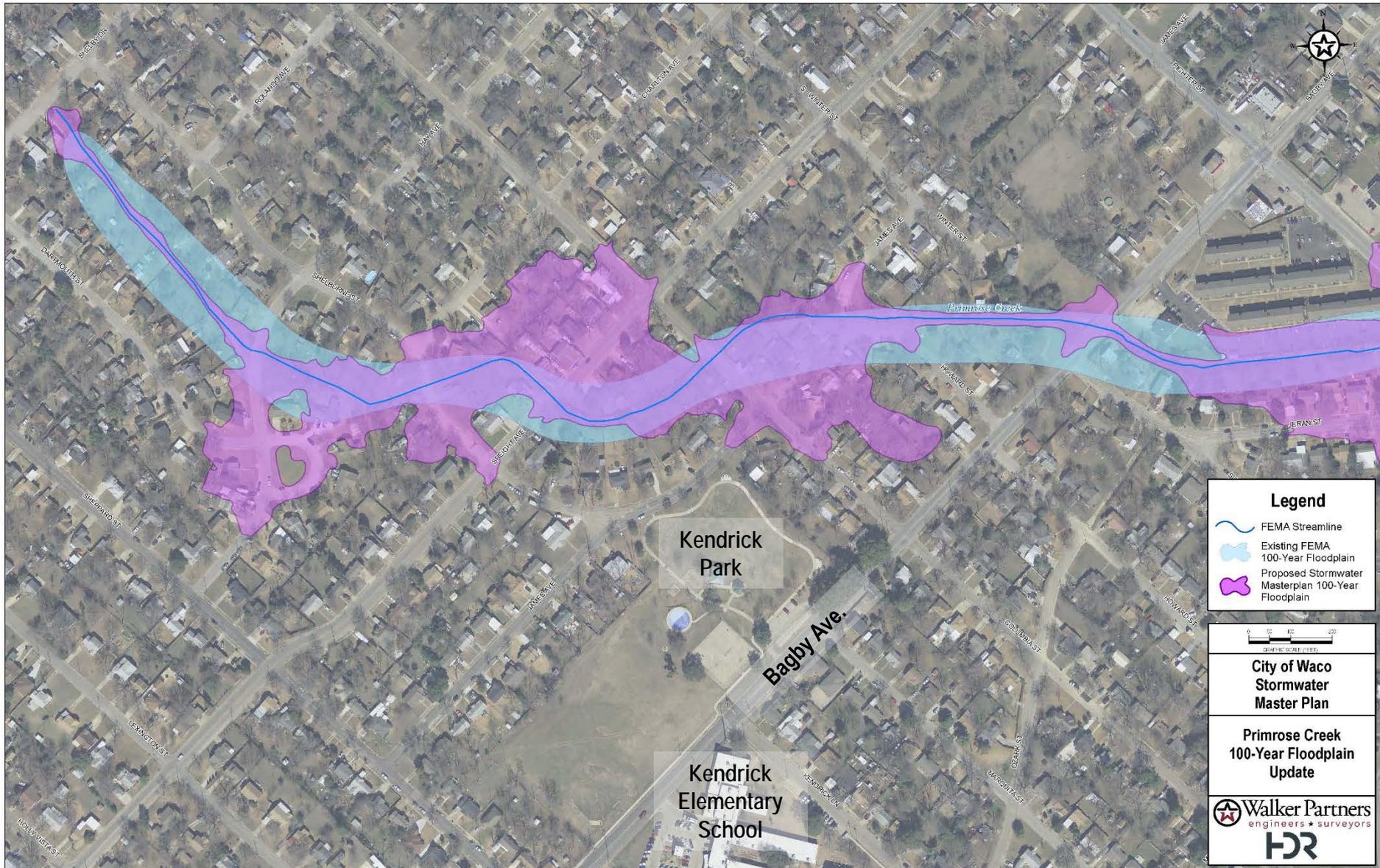
# Update FEMA Floodplain Maps

# Updated 100-Year Floodplain Boundaries





# Updated 100-Year Floodplain Boundaries



# Capital Improvement Program

# Flood Mitigation Strategies

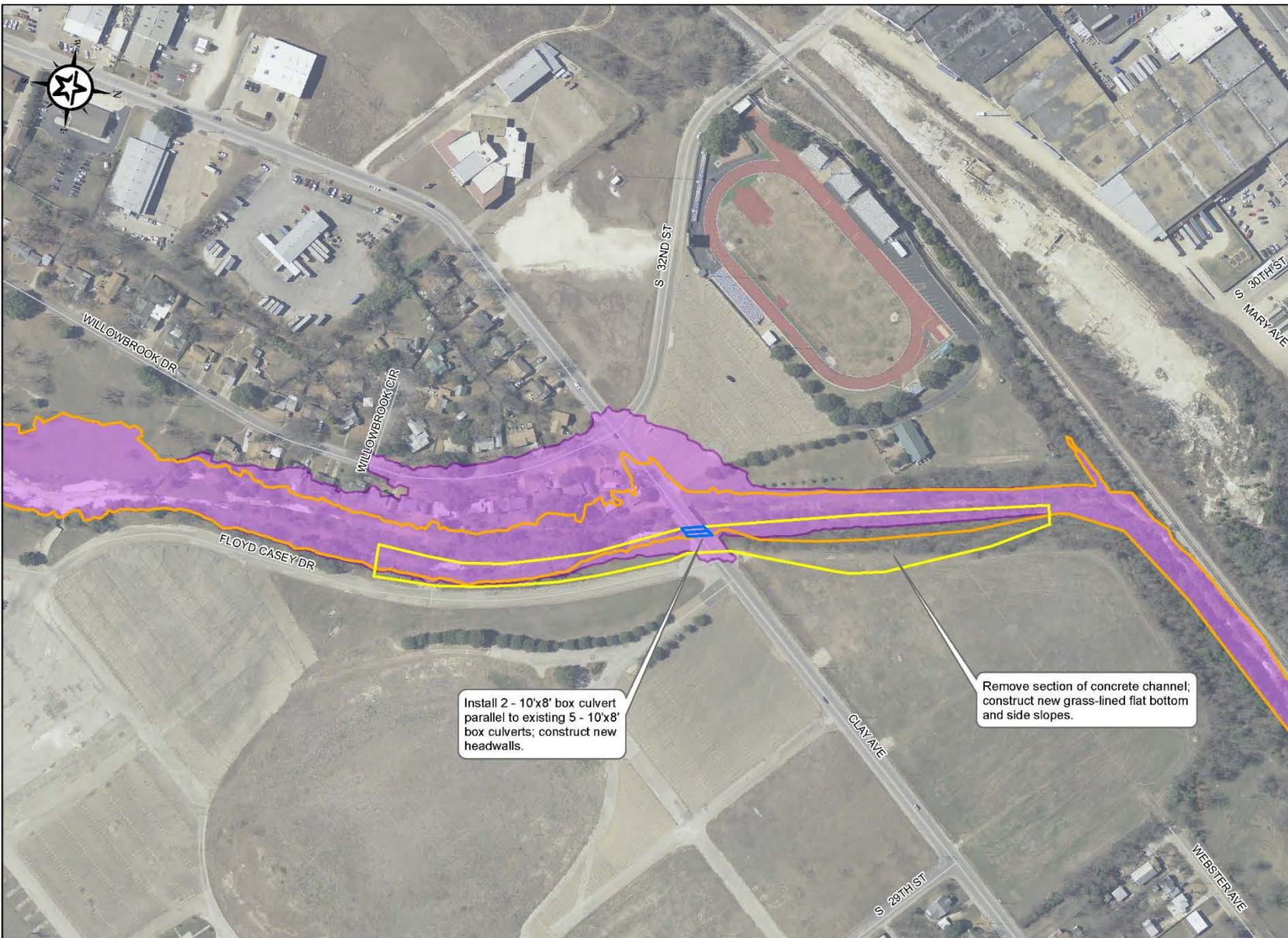
---

## Structural Mitigation Options

- Conveyance Improvements
  - Channel Improvements
    - Widen the channel to increase flow capacity
    - Acquire additional drainage easements
  - Culvert / Bridge Improvements
    - Required where undersized structures create upstream flooding
- Regional Detention Facilities
  - Reduces the peak flow rates in downstream water courses
  - Requires available open land upstream of problem area

## Non-structural Mitigation Options

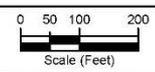
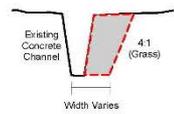
- Drainage Criteria Implementation
  - “No adverse drainage impacts”
- Property Acquisition / Buyouts
  - May be favorable when flood mitigation costs > property values



**Legend**

- Proposed Channel Extents
- 2011 - 1% Floodplain With Project WCR002
- 2011 - 1% Floodplain

**Typical Channel Section**



**WAC002: Floyd Casey Stream Restoration & Culvert Improvements**



CITY OF WACO





# C.I.P. Ranking Criteria

	Prioritization Criteria	Highest Possible Score
Flood Damage Reduction	Reduction of Flooding to Habitable Structures	25
	Public Safety/Mobility	20
	Channel Stability	10
Project Implementation	Engineering Economy	15
	Funding Sources	10
	Right-of-Way / Easement Acquisition	5
	Ease of Permitting	5
Environmental Considerations	Enhancement of Water Quality, Habitat, and Environment	6
	Floodplain Reclamation	5
	Neighborhood Impacts	3
	Potential for Recreation/Open Space/Connectivity for Linear Parks	3
<b>Total Score</b>		<b>107</b>

# Prioritization of the SWMP C.I.P.s

Rank	Project ID	Project Name	Score	Estimated Cost
1	FCR005	Chapel Road Detention	85	\$ 6,901,250
2	WAC001	Mary Avenue Diversion	83	\$ 60,000,000
3	PMR004	Hay Avenue to Columbia Street Channel & Culvert Improvements	78	\$ 2,521,830
4	NWC003	New Road to Homan Avenue Channel & Culvert Improvements	77	\$ 4,562,800
5	MAR001	S. M.L.K. Jr Boulevard Channel Improvements	76	\$ 2,164,485
6	PMR001	Oakwood Channel & Bridge Improvements	69	\$ 30,752,083
7	PMR003	Richter Street Channel & Culvert Improvements	64	\$ 854,380
8	DEL001	Sharondale Drainage Improvements	63	\$ 3,261,910
9	PMR002	IH-35 Betterments	62	\$ 3,605,535
10	WAC002	Floyd Casey Stream Restoration & Culvert Improvements	62	\$ 1,256,260
11	NWC001	N. 31st Street Buyouts	59	\$ 3,169,971
12	BRN002	N. 15th Street Buyouts	58	\$ 1,346,703
13	WAC003	Grice Drive Buyouts	58	\$ 3,403,080
14	COT003	Beverly Drive Culvert Improvements	51	\$ 623,415
15	NWC002	N. 33rd Street Buyouts	49	\$ 644,994
16	BRN001	N. 10th Street Buyouts	48	\$ 771,621
17	COT001	Loop 340 Berm & Frontage Road Improvements	47	\$ 6,209,860

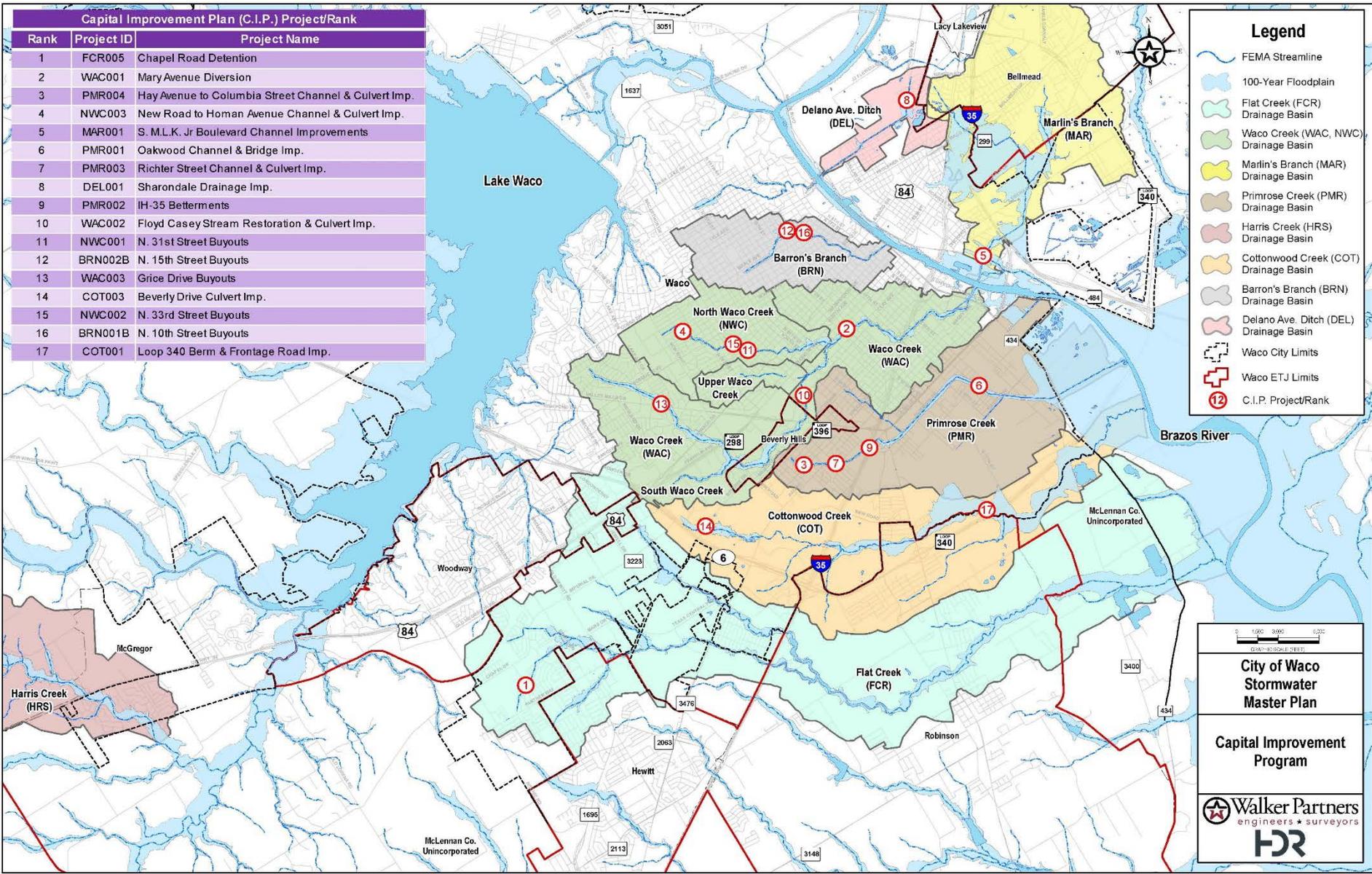
**Storm Water**

**C.I.P.**

**\$132,050,177**

# Capital Improvement Program

Capital Improvement Plan (C.I.P.) Project/Rank		
Rank	Project ID	Project Name
1	FCR005	Chapel Road Detention
2	WAC001	Mary Avenue Diversion
3	PMR004	Hay Avenue to Columbia Street Channel & Culvert Imp.
4	NWC003	New Road to Homan Avenue Channel & Culvert Imp.
5	MAR001	S. M.L.K. Jr Boulevard Channel Improvements
6	PMR001	Oakwood Channel & Bridge Imp.
7	PMR003	Richler Street Channel & Culvert Imp.
8	DEL001	Sharondale Drainage Imp.
9	PMR002	IH-35 Betterments
10	WAC002	Floyd Casey Stream Restoration & Culvert Imp.
11	NWC001	N. 31st Street Buyouts
12	BRN002B	N. 15th Street Buyouts
13	WAC003	Grice Drive Buyouts
14	COT003	Beverly Drive Culvert Imp.
15	NWC002	N. 33rd Street Buyouts
16	BRN001B	N. 10th Street Buyouts
17	COT001	Loop 340 Berm & Frontage Road Imp.



**Legend**

- FEMA Streamline
- 100-Year Floodplain
- Flat Creek (FCR) Drainage Basin
- Waco Creek (WAC, NWC) Drainage Basin
- Marlin's Branch (MAR) Drainage Basin
- Primrose Creek (PMR) Drainage Basin
- Harris Creek (HRS) Drainage Basin
- Cottonwood Creek (COT) Drainage Basin
- Barron's Branch (BRN) Drainage Basin
- Delano Ave. Ditch (DEL) Drainage Basin
- Waco City Limits
- Waco ETJ Limits
- C.I.P. Project/Rank

0 1500 3000 4500  
GRAPHIC SCALE (FEET)

**City of Waco  
 Stormwater  
 Master Plan**

**Capital Improvement  
 Program**

**Walker Partners**  
 engineers \* surveyors

**HDR**

# Analyze Funding Options

---

- Stormwater projects not a significant part of most recent of bond issuances
- Economic Impact of COVID-19
  - Resources stretched
  - Difficult time for new fees

## Possible Funding Sources

- TWDB Flood Infrastructure Fund
- Storm Water Utility Fee
- Developer Participation / TIF Funding

# Next Steps

---

Task	Target Date
Submit <b>abridged grant applications</b> for selected projects to TWDB for Flood Infrastructure Funding	15 June 2020
Secure LOMRs for all streams within planning area	15 July 2020
Complete <u>Drainage Criteria</u> and “ <b>Drainage Policy</b> ,” and update <b>Floodplain Ordinance</b>	15 July 2020
Complete “DRAFT” Storm Water Utility Fee for City’s consideration	15 July 2020
Submit <b>full grant applications</b> to TWDB for short-listed projects that also include TIF funding and/or developer participation	Fall 2020
Complete Brazos River floodplain analysis, submit and secure LOMR	Feb 2021
Conduct Public Meetings or video conferences to adhere to social distancing	TBD