

# Broadmoor Drainage Upgrades and Green Infrastructure Project

Resilience Project Design Review Committee Presentation

Louis Jackson, P.E.

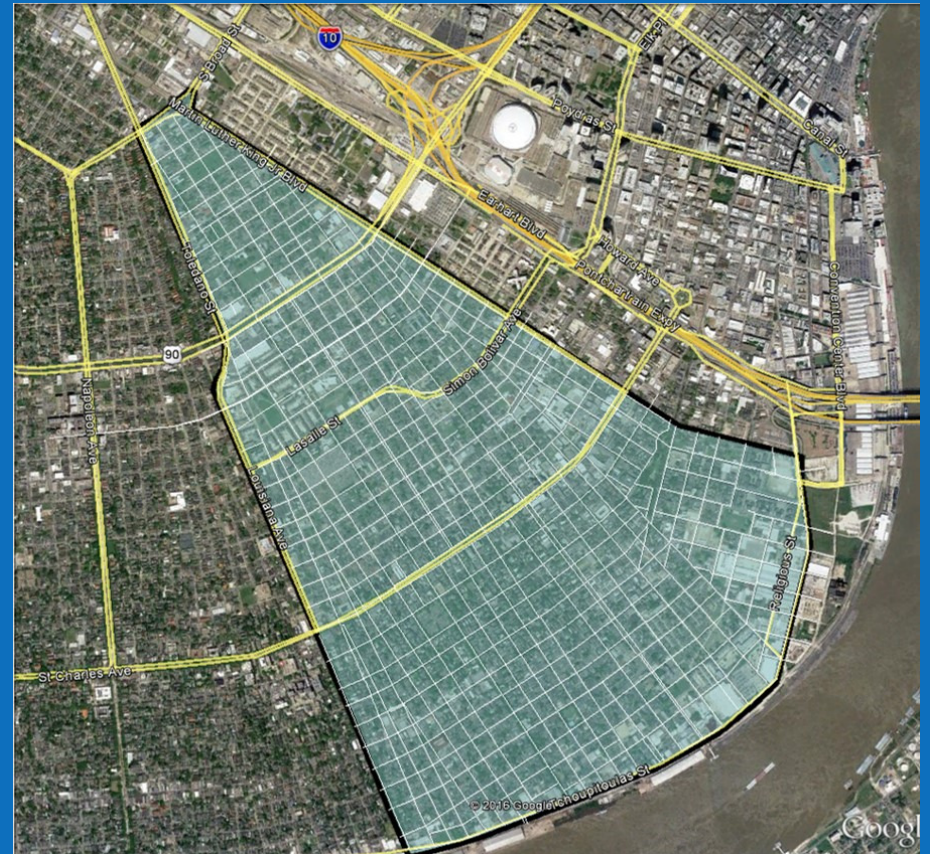
*September 22, 2016*



**CDM  
Smith®**

# Broadmoor Project Area

- Project Boundaries
  - Louisiana, Tchoupitoulas  
Melpomene/MLK, Broad
- Encompasses all or part of  
8 uptown neighborhoods
- Nearly 1800 Acres in size

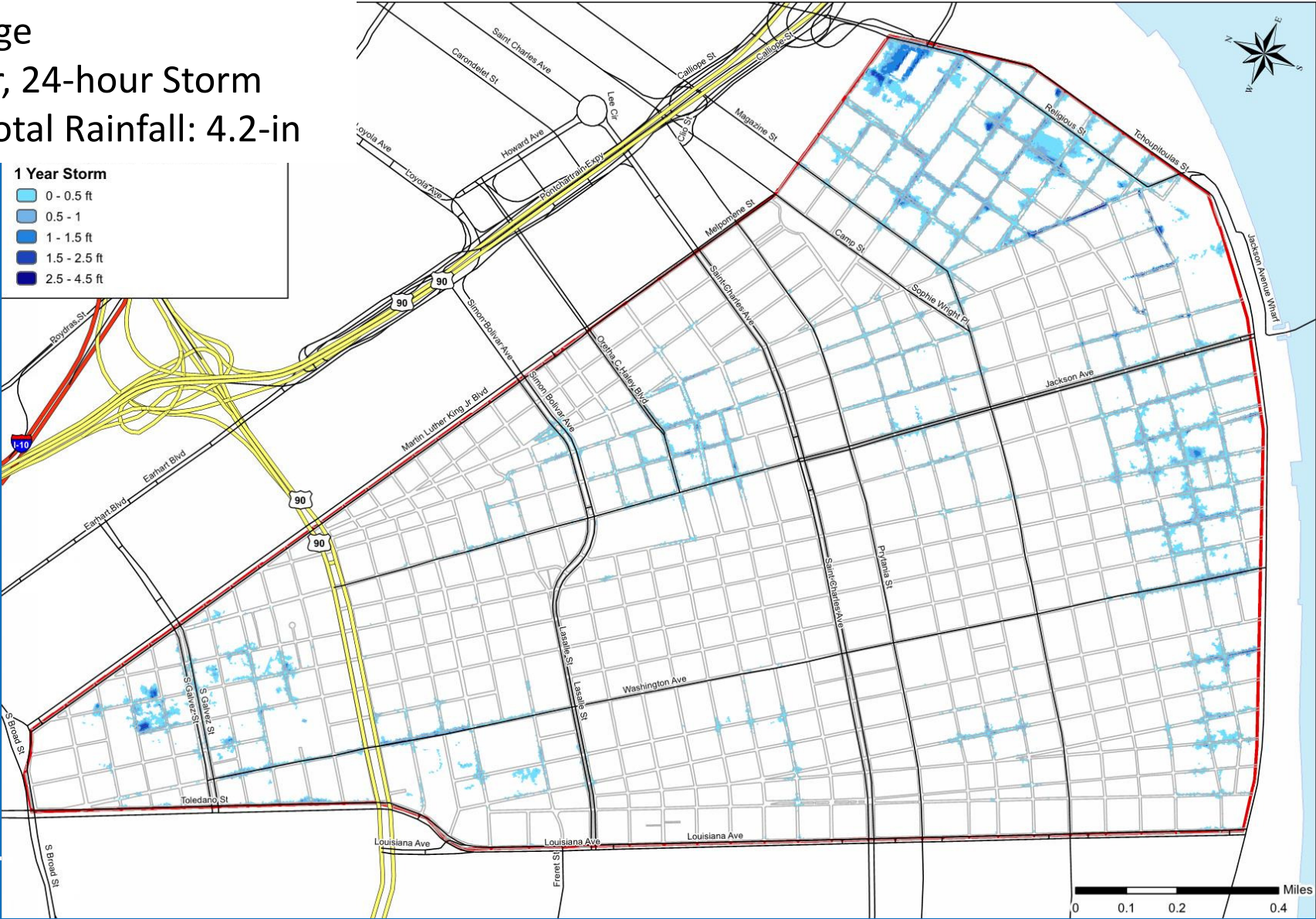


# Problem Definition – Existing System

- High level of imperviousness
- Undersized primary stormwater management system (PSMS)
- Localized flooding during modeling of 1-yr & 2-yr storms
- Wide spread flooding during modeling of 5-yr & 10-yr storms

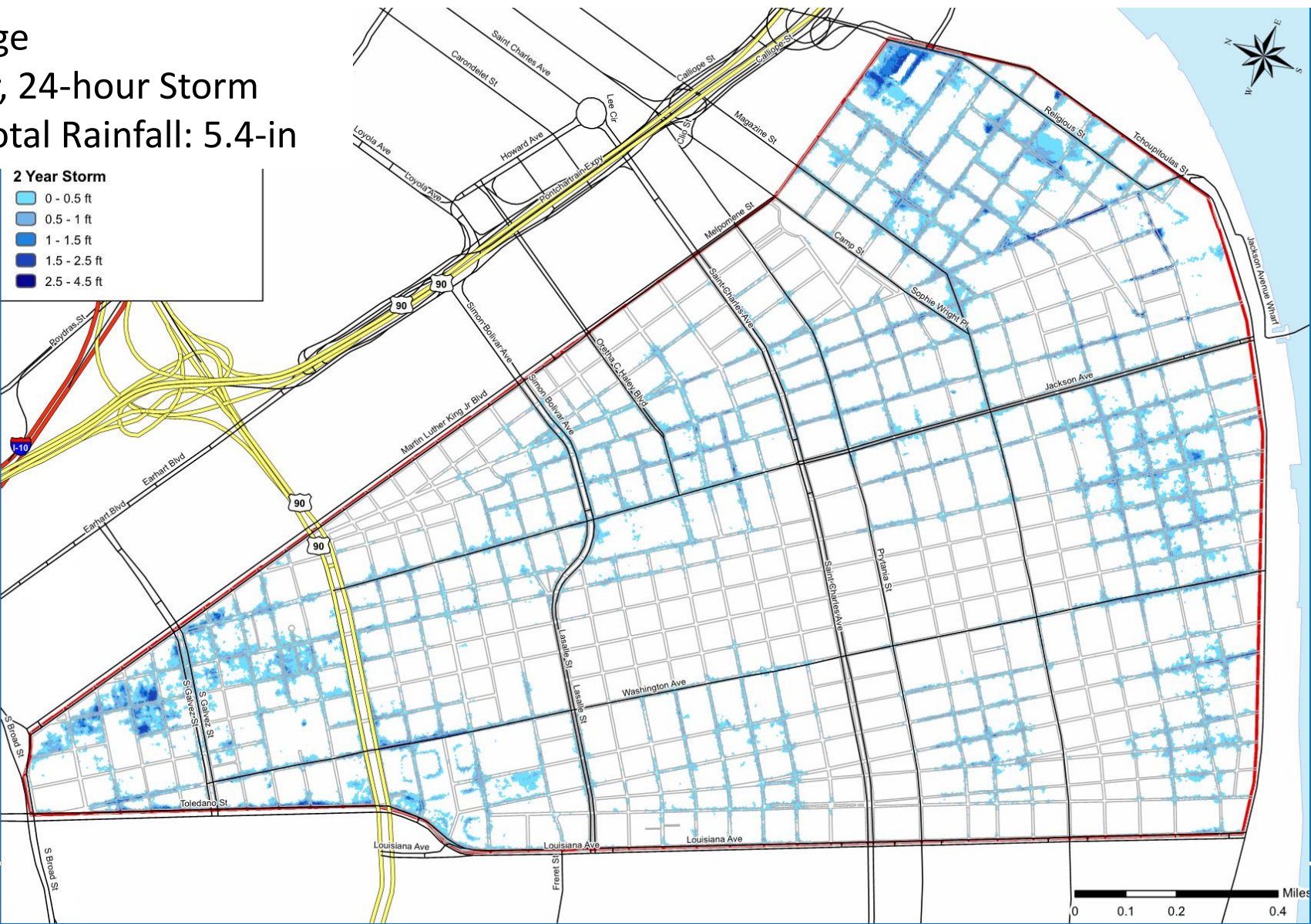


Peak Flooding Stage  
Broadmoor 1-year, 24-hour Storm  
Peak Hr: 1.05-in Total Rainfall: 4.2-in

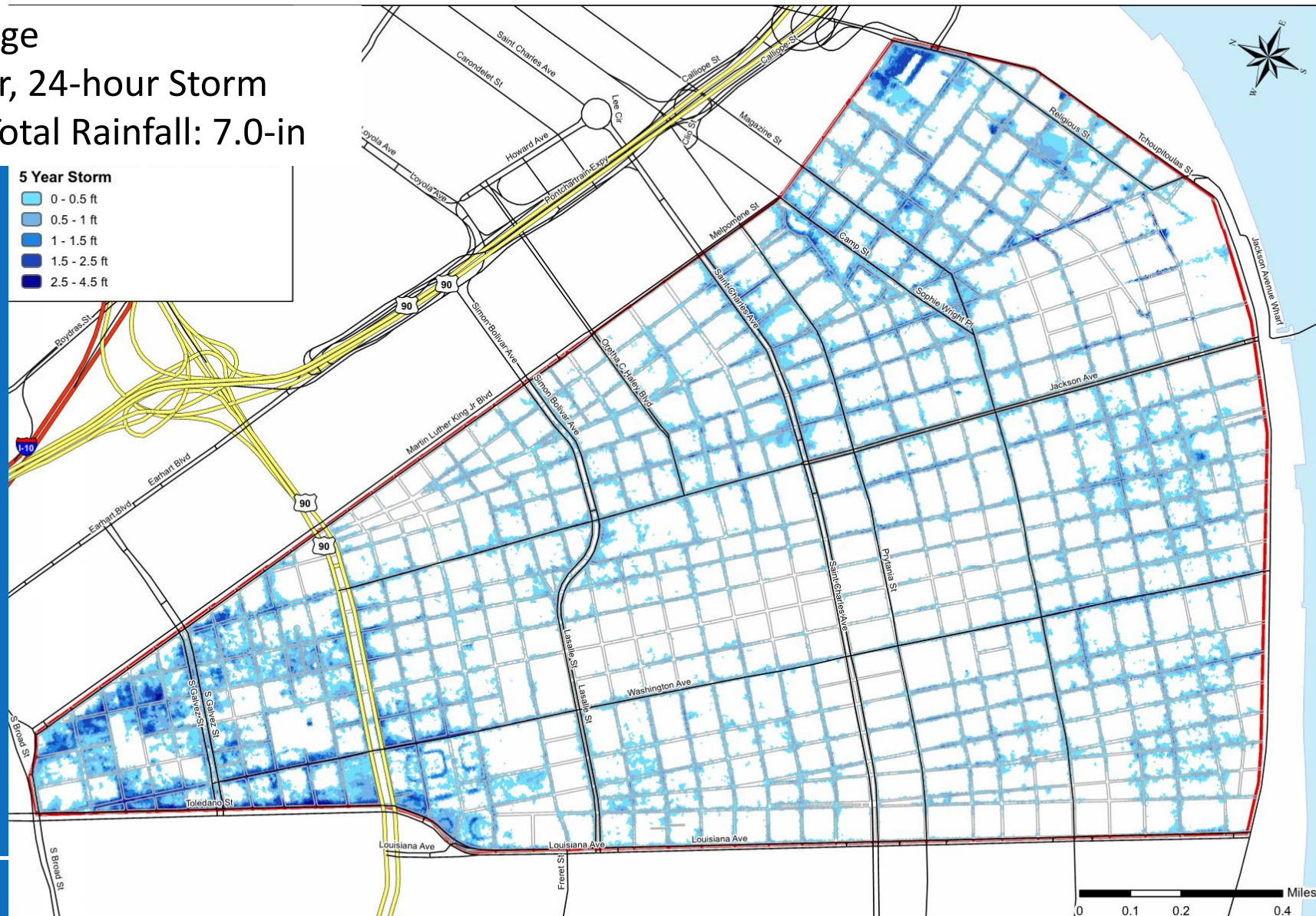




Peak Flooding Stage  
Broadmoor 2-year, 24-hour Storm  
Peak Hr: 1.35-in Total Rainfall: 5.4-in

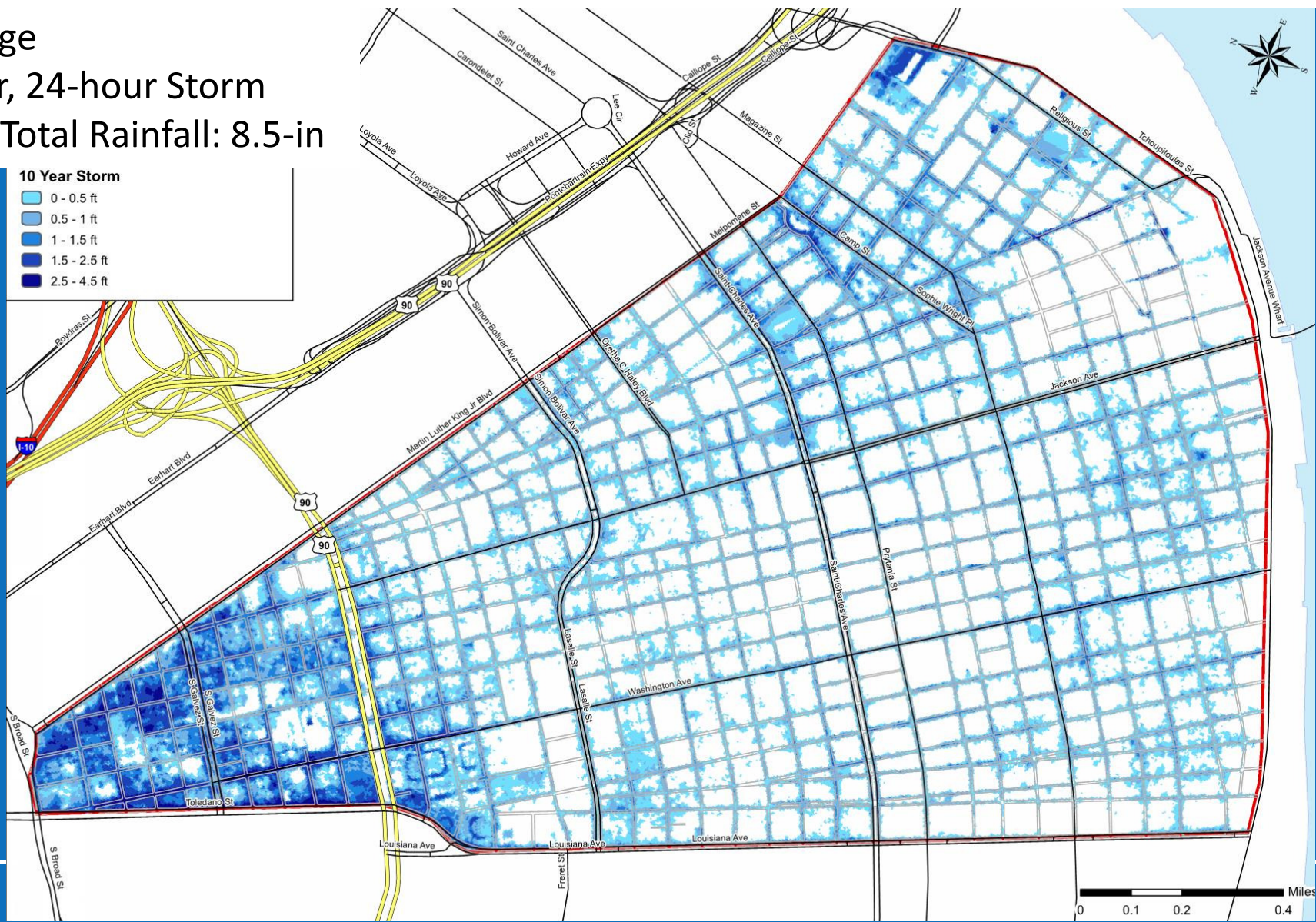




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Peak Flooding Stage  
Broadmoor 5-year, 24-hour Storm  
Peak Hr: 2.125-in Total Rainfall: 8.5-in



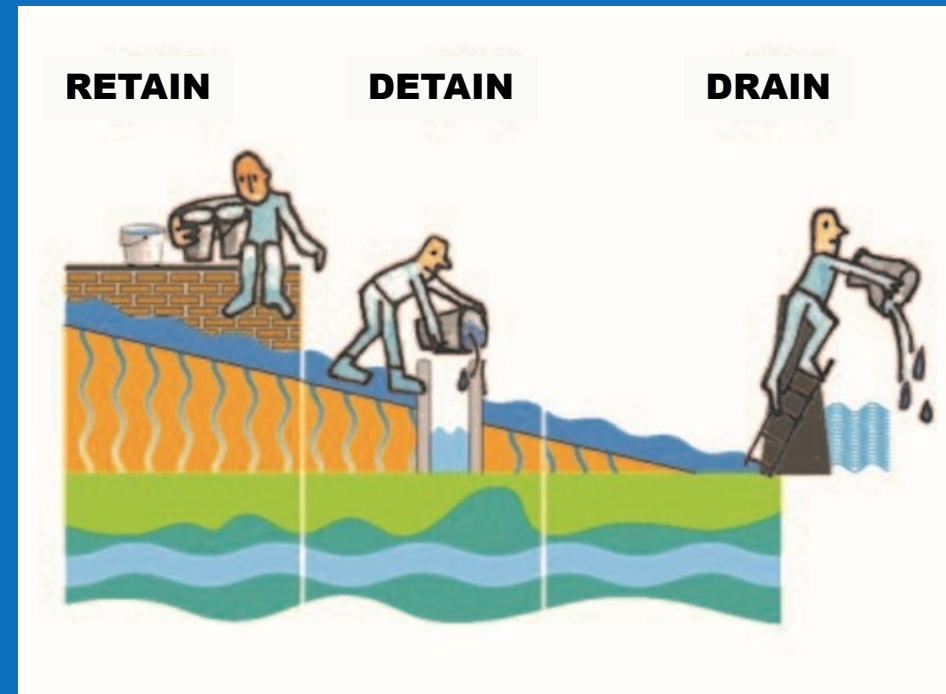


# Damages to Properties and Infrastructure

- Flooded Buildings
- Inaccessible Properties
- Impassable Roads
- Citizens at Risk

Design Storm	Buildings in Flooded Areas	Parcels in Flooded Areas	Miles of Flooded Roadways
1-Year Storm	597	1032	5.0
2-Year Storm	1517	2594	15.0
5-Year Storm	3148	4847	35.7
10-Year Storm	4375	6285	54.3
100-Year Storm	6825	7800	77.7

- General Philosophy
  - Store what can be stored in place
  - Slow down runoff where possible
  - Upgrade system where needed
  - Enhance community amenities
- Proposed Solutions
  - Install subsurface storage
  - Provide surface level detention
  - Create pathways for drainage
  - High performance fields



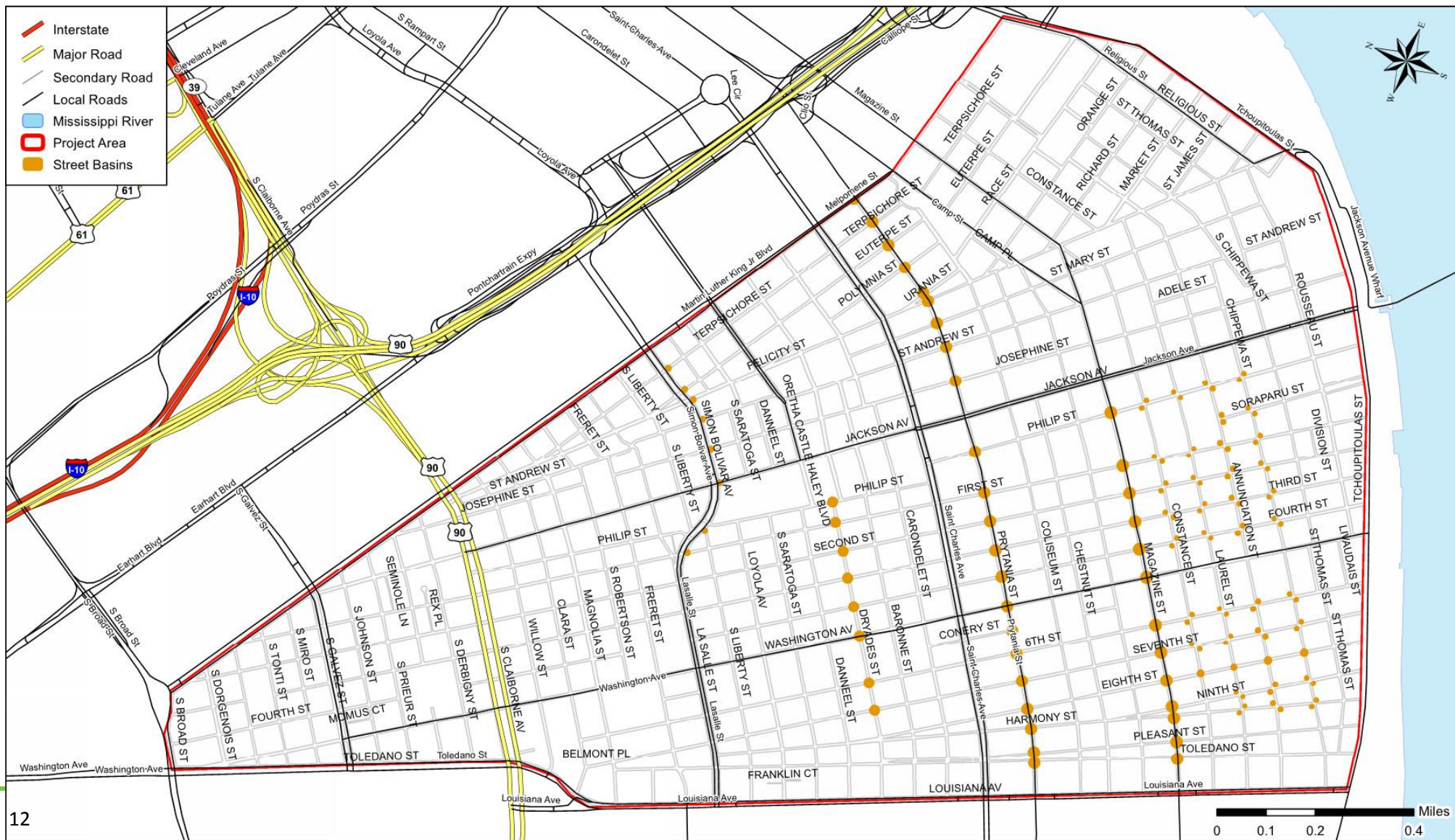
# Proposed Green Infrastructure Facilities

- Corner Street Basins
- Pervious Crosswalks and Parking
- Urban Bioswales/Road Reconfiguration
- Stormwater Lots
- High Performance Fields
- Pipe Installation and Upgrades





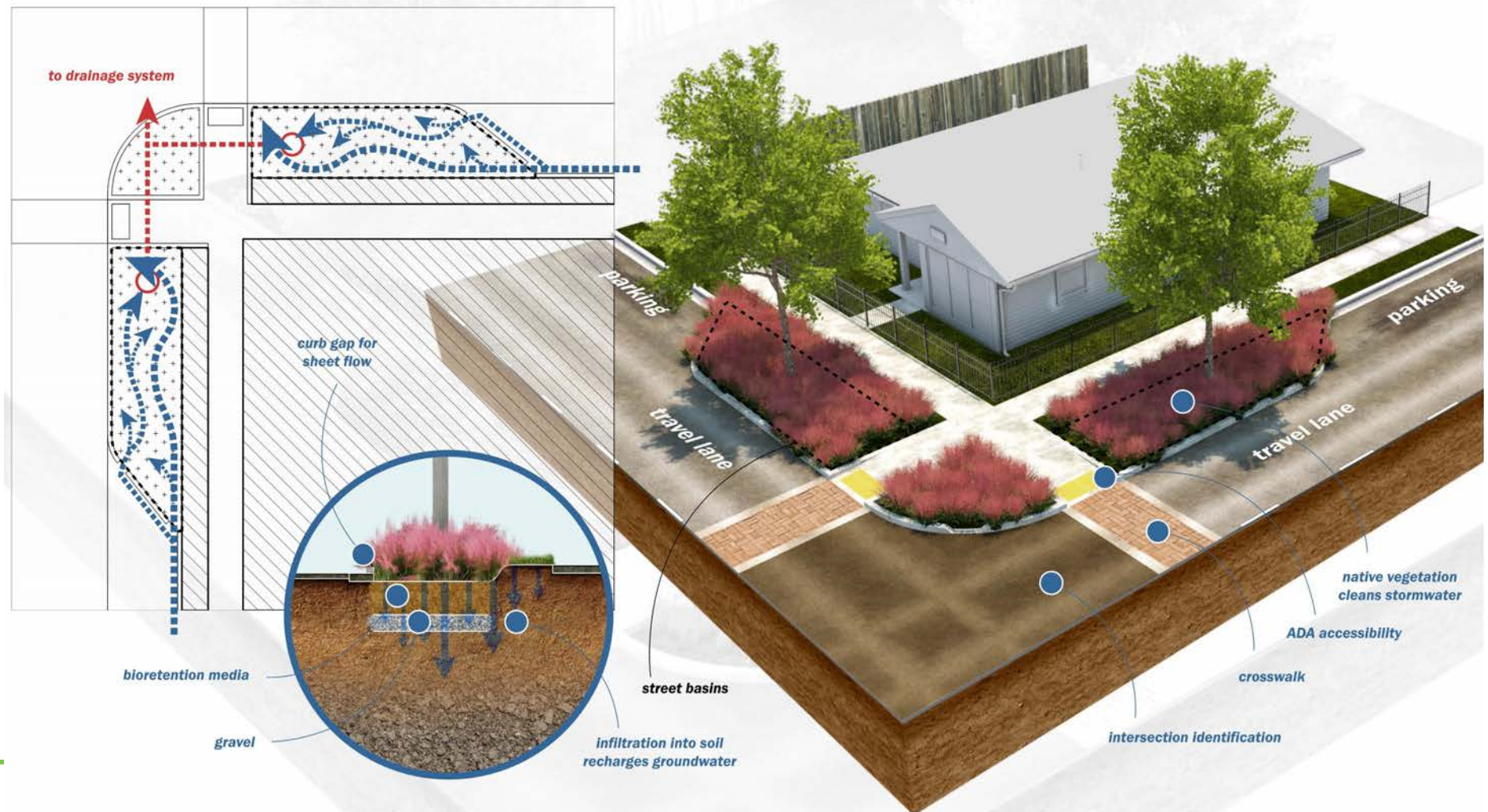
# Corner Street Basin





# GREEN INFRASTRUCTURE FACILITY

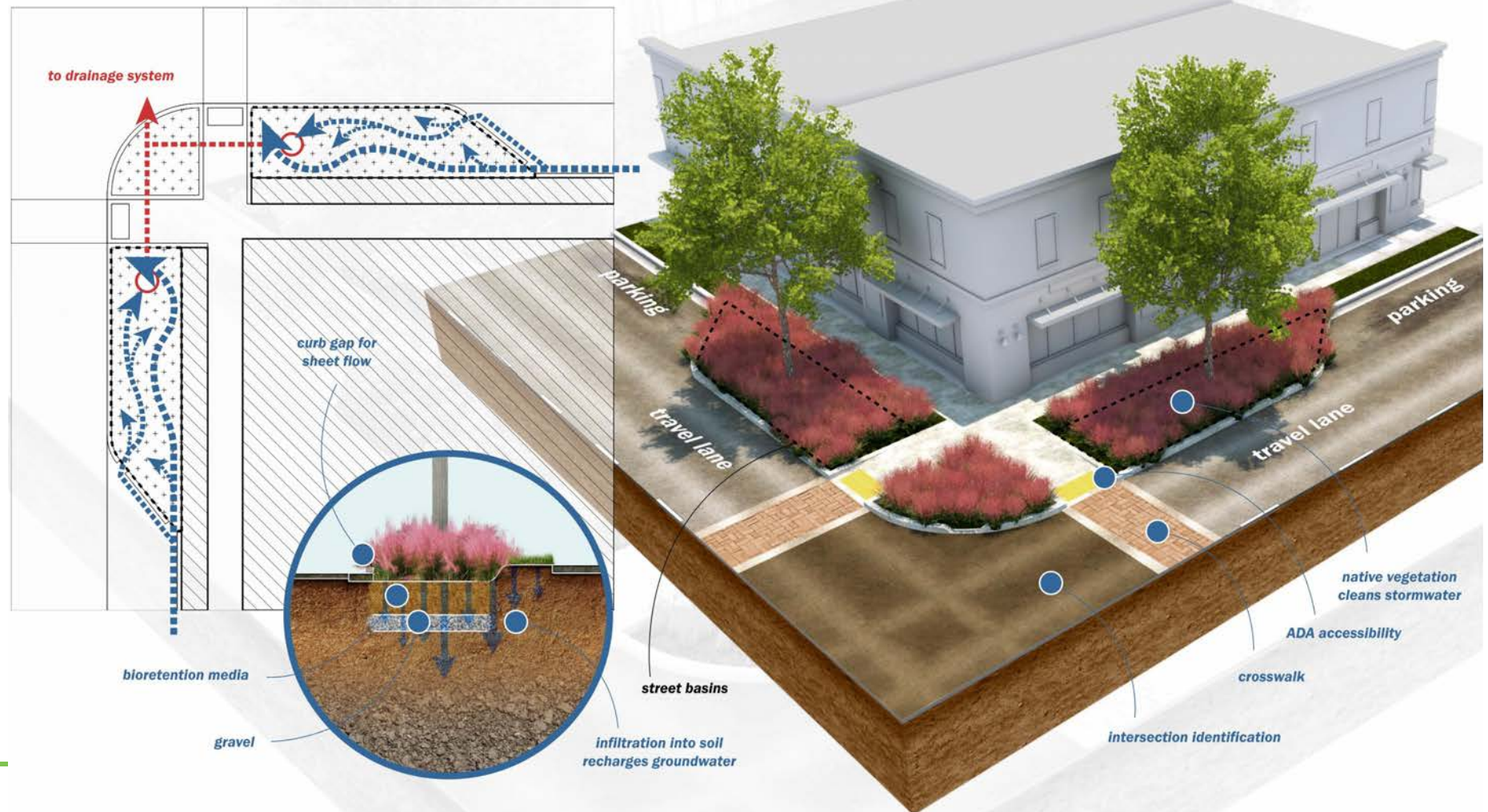
## CORNER STREET BASIN

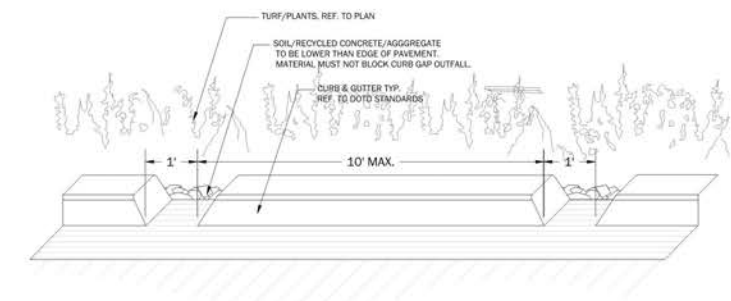
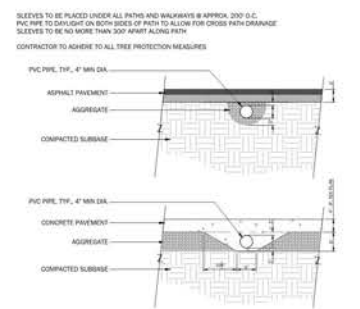
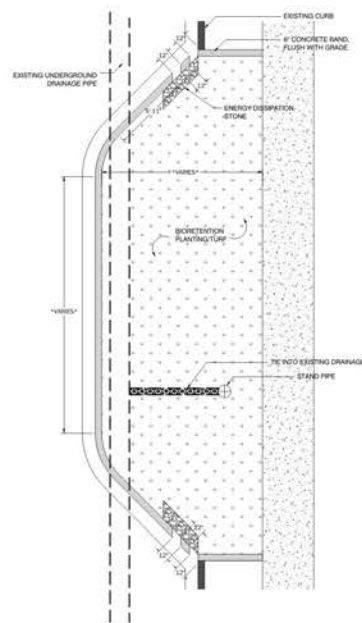
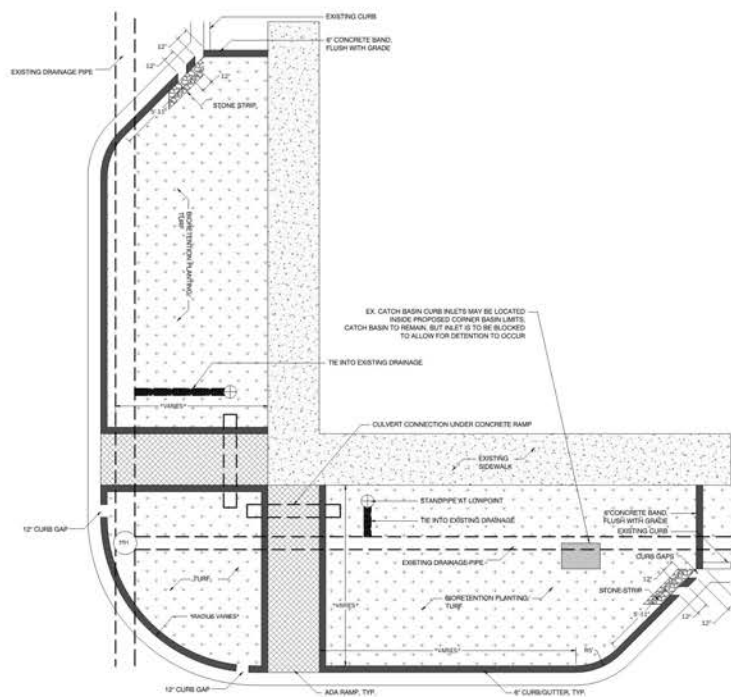




# GREEN INFRASTRUCTURE FACILITY

## CORNER STREET BASIN

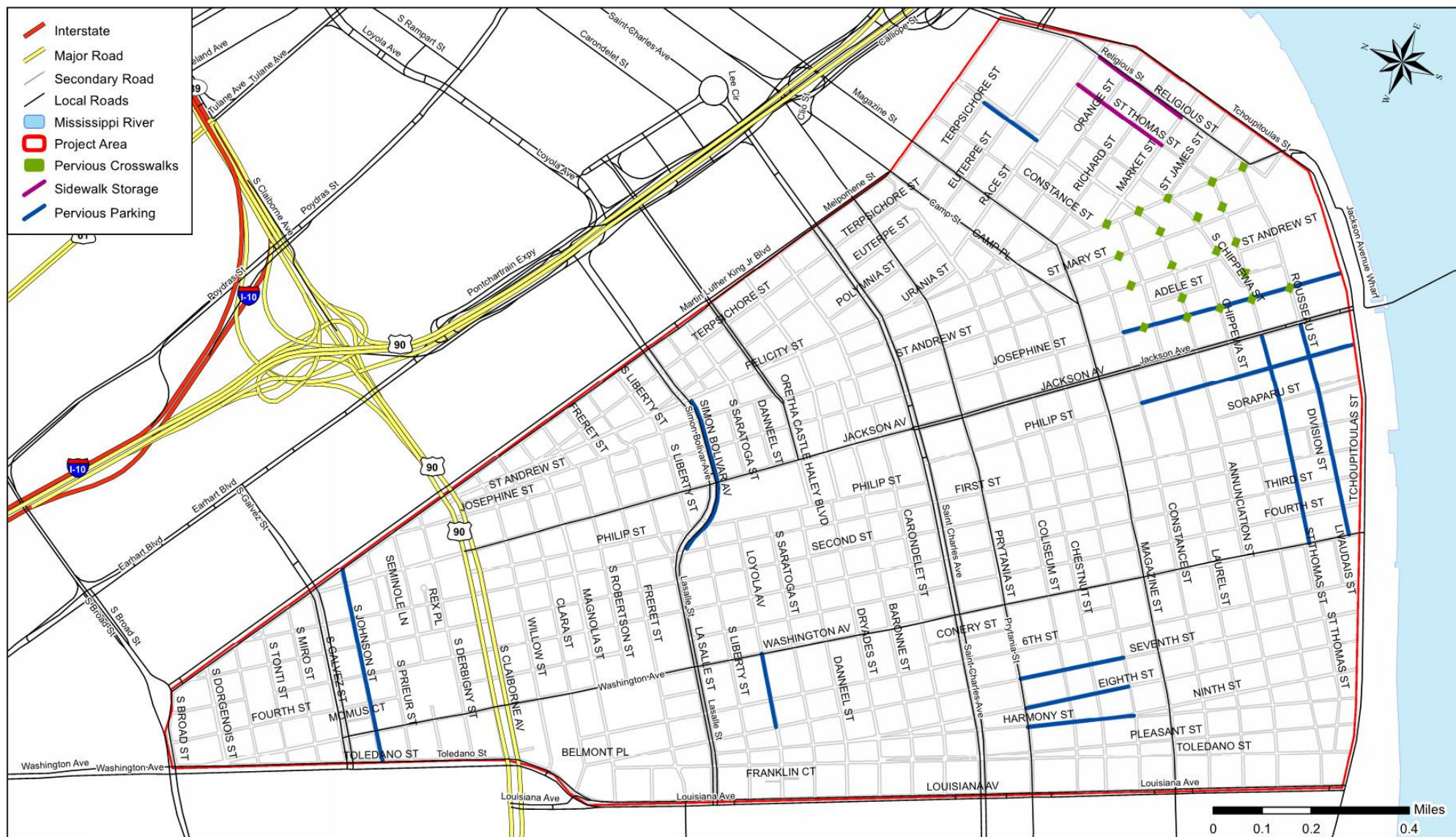






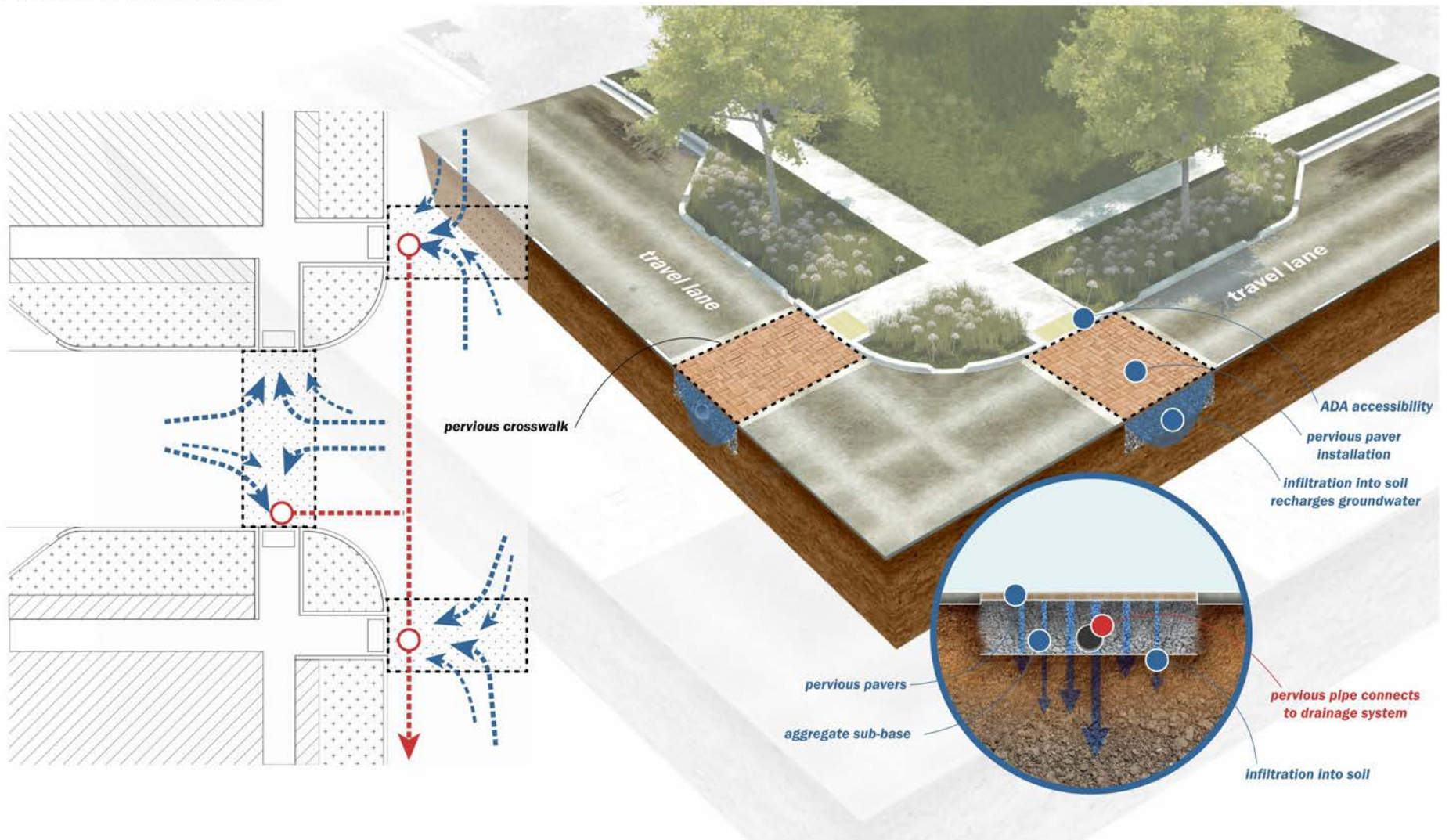
# Pervious Crosswalk and Parking





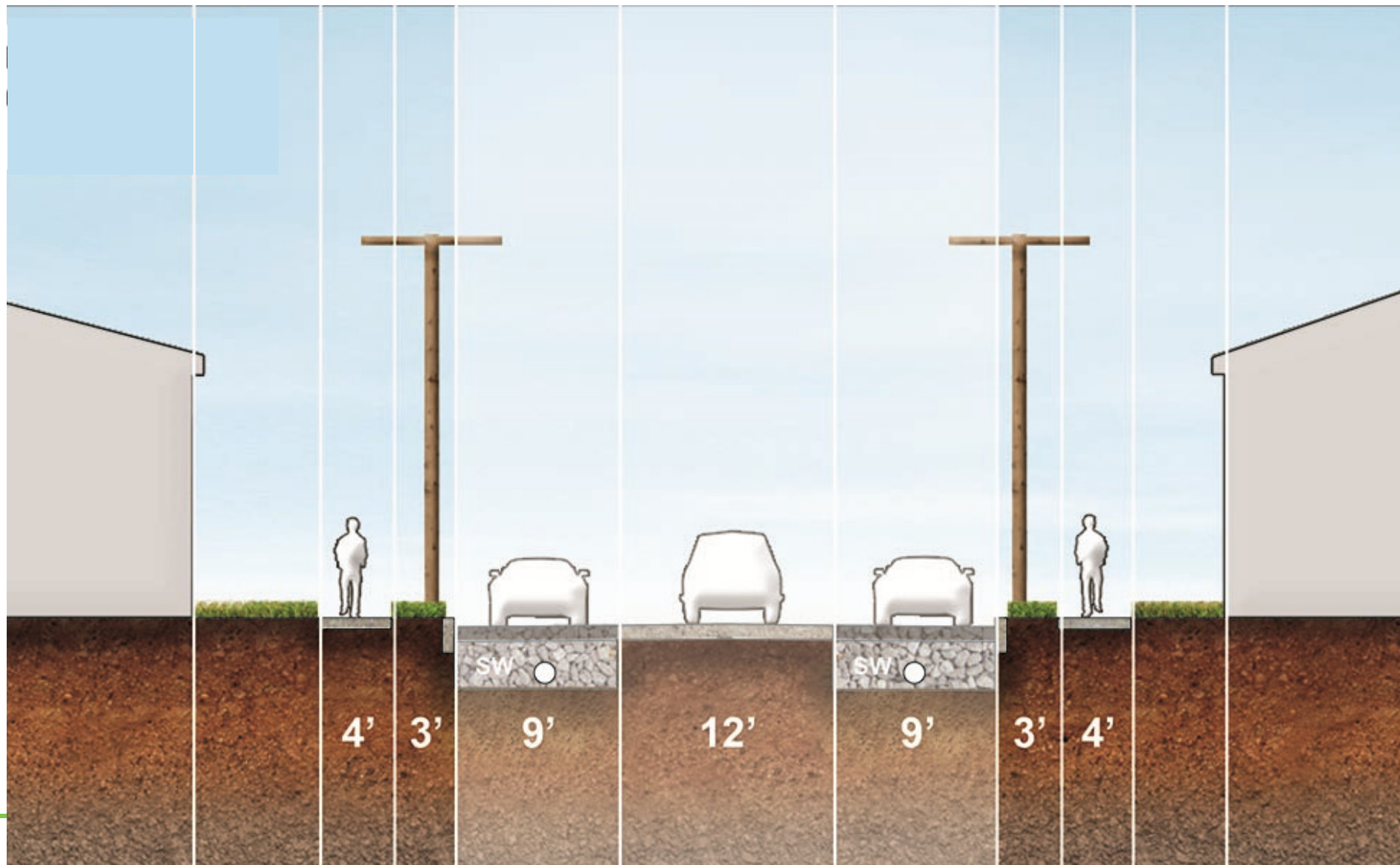
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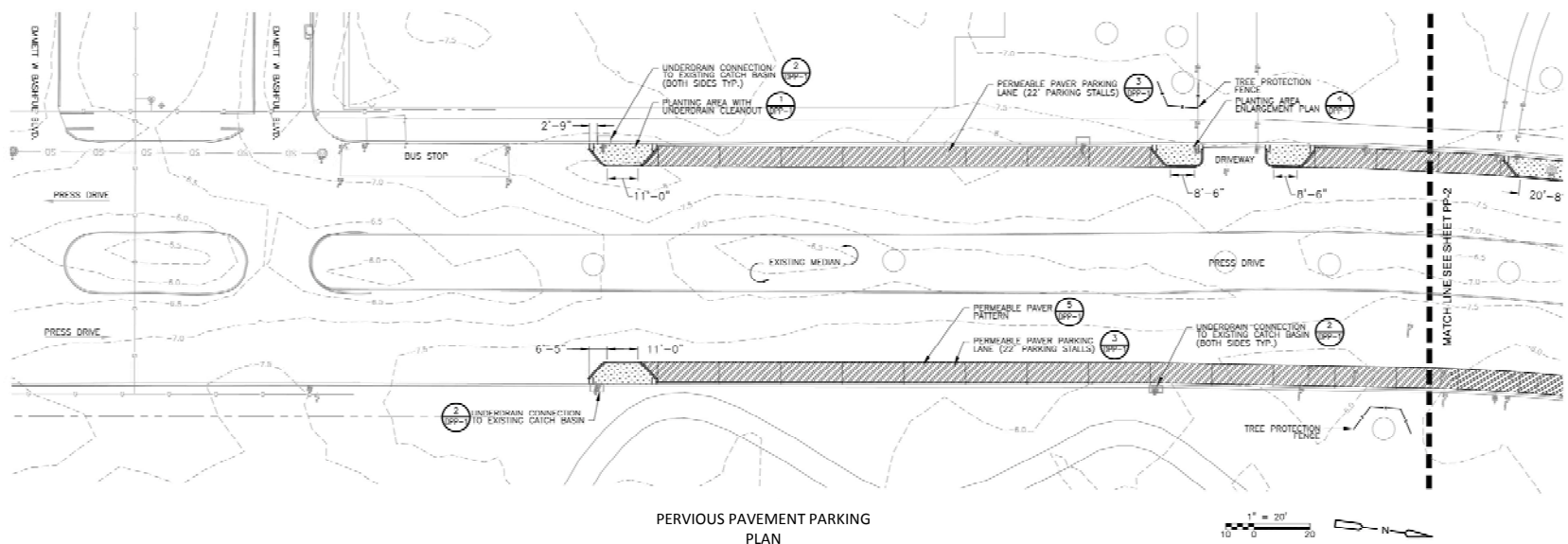
## PERVIOUS CROSSWALK











PERVIOUS PAVEMENT PARKING  
PLAN

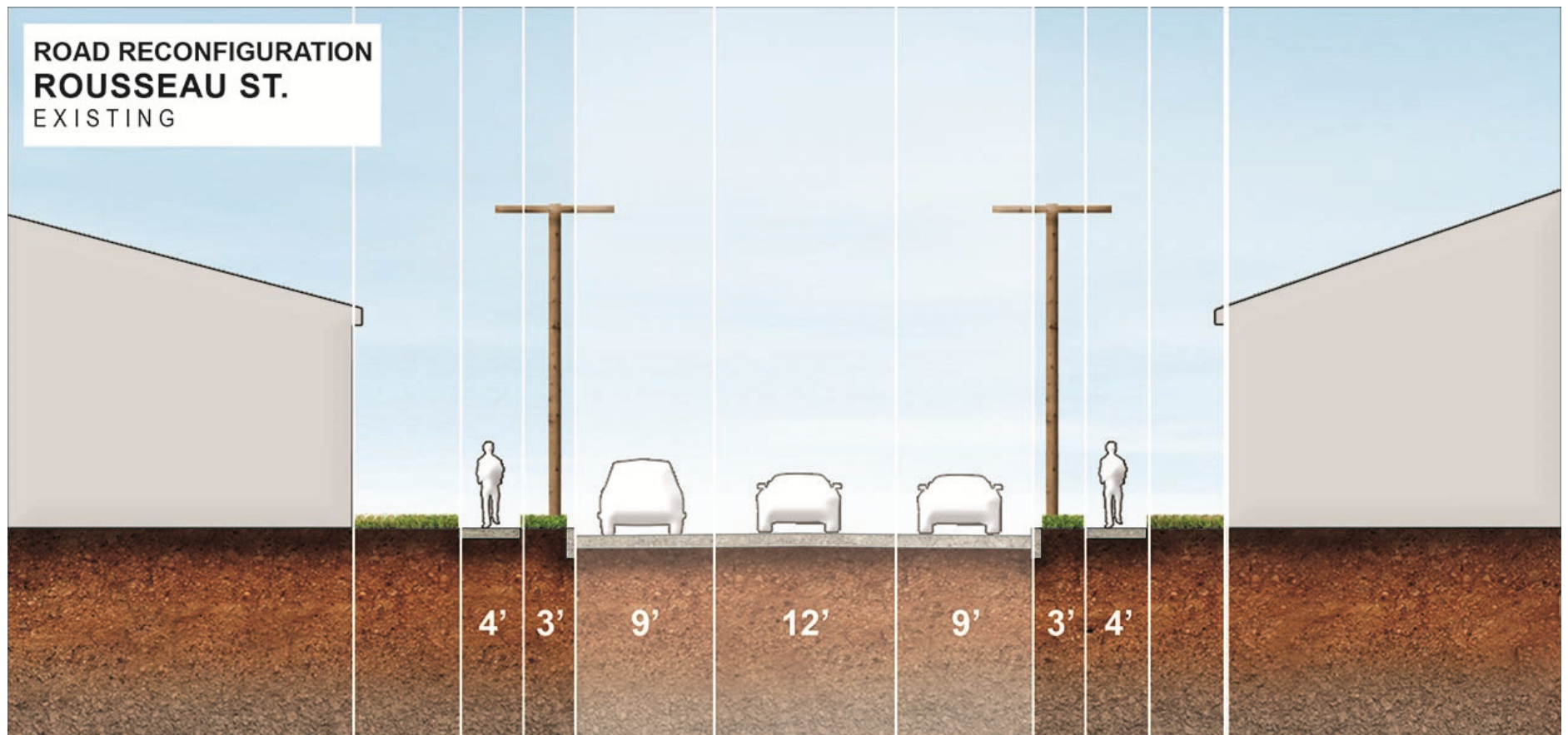




# Road Reconfiguration w/ Bioswale

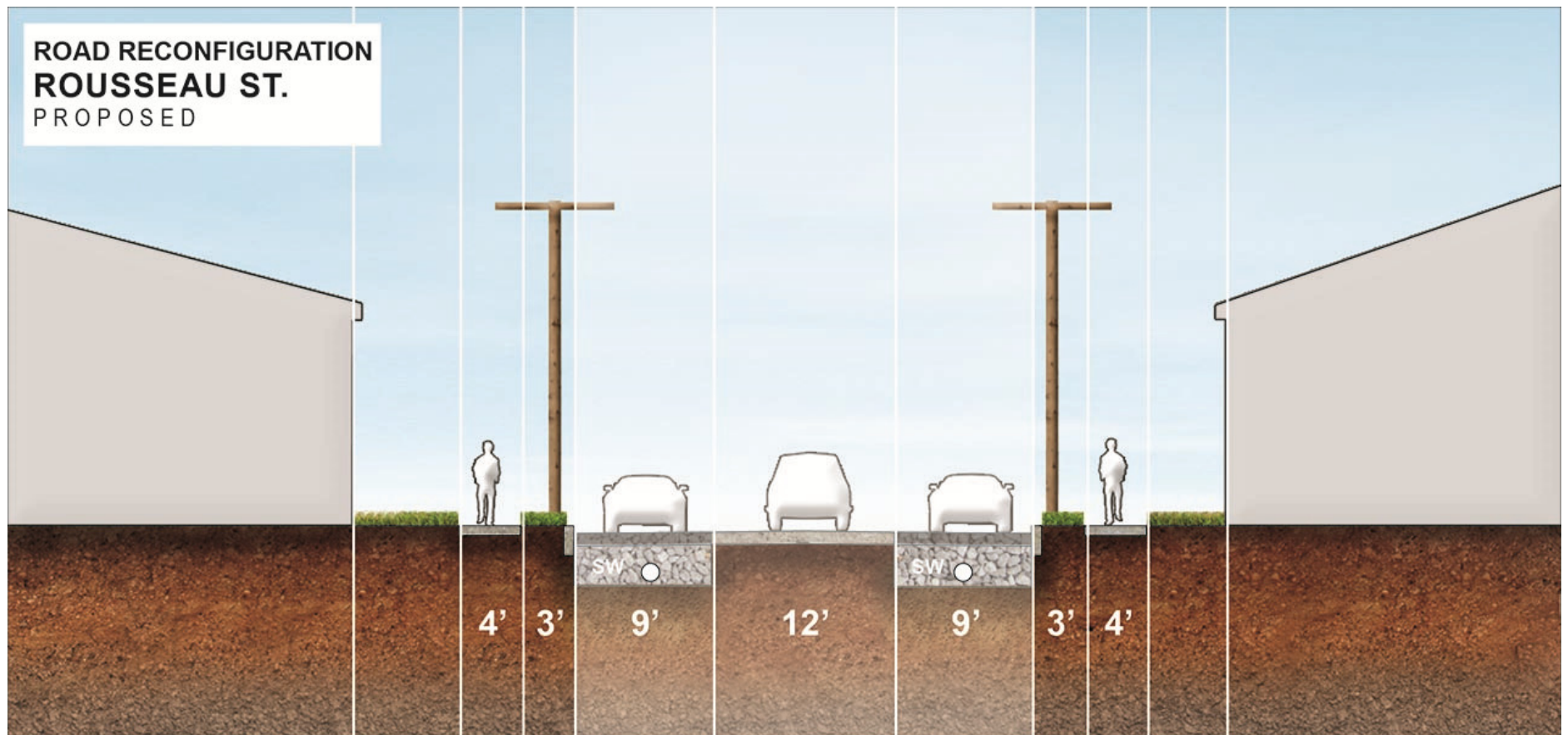


**ROAD RECONFIGURATION  
ROUSSEAU ST.**  
EXISTING



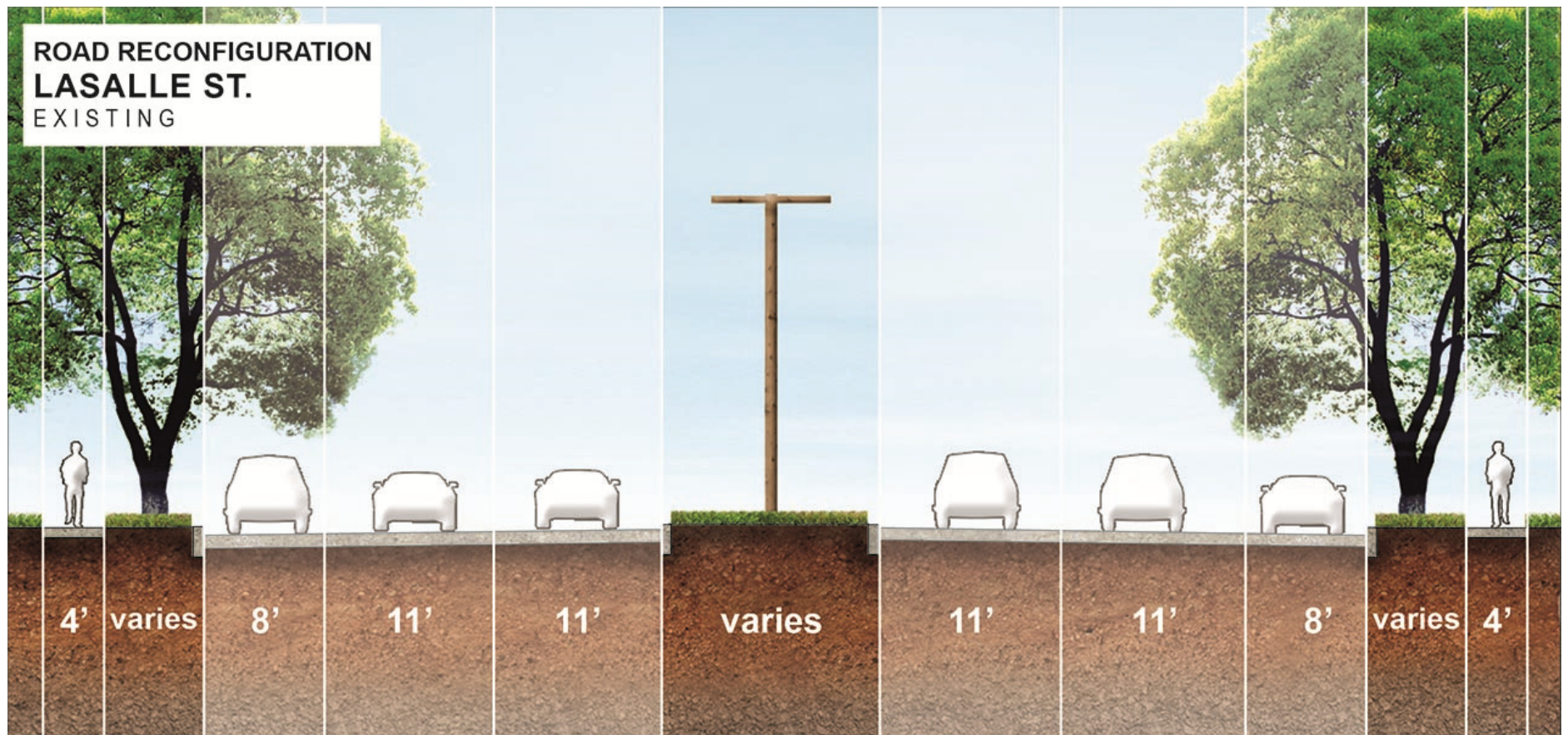


**ROAD RECONFIGURATION  
ROUSSEAU ST.  
PROPOSED**

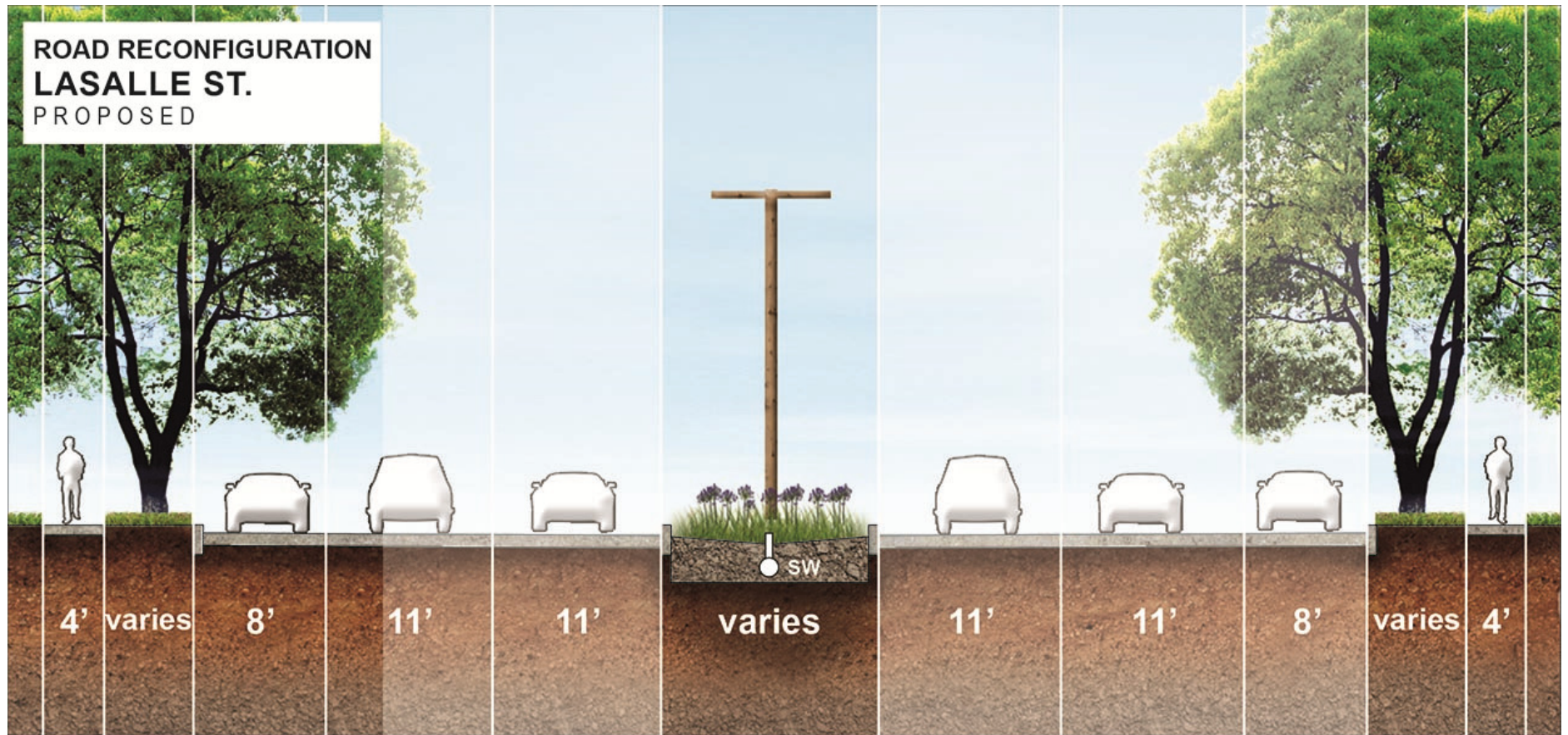




**ROAD RECONFIGURATION  
LASALLE ST.  
EXISTING**

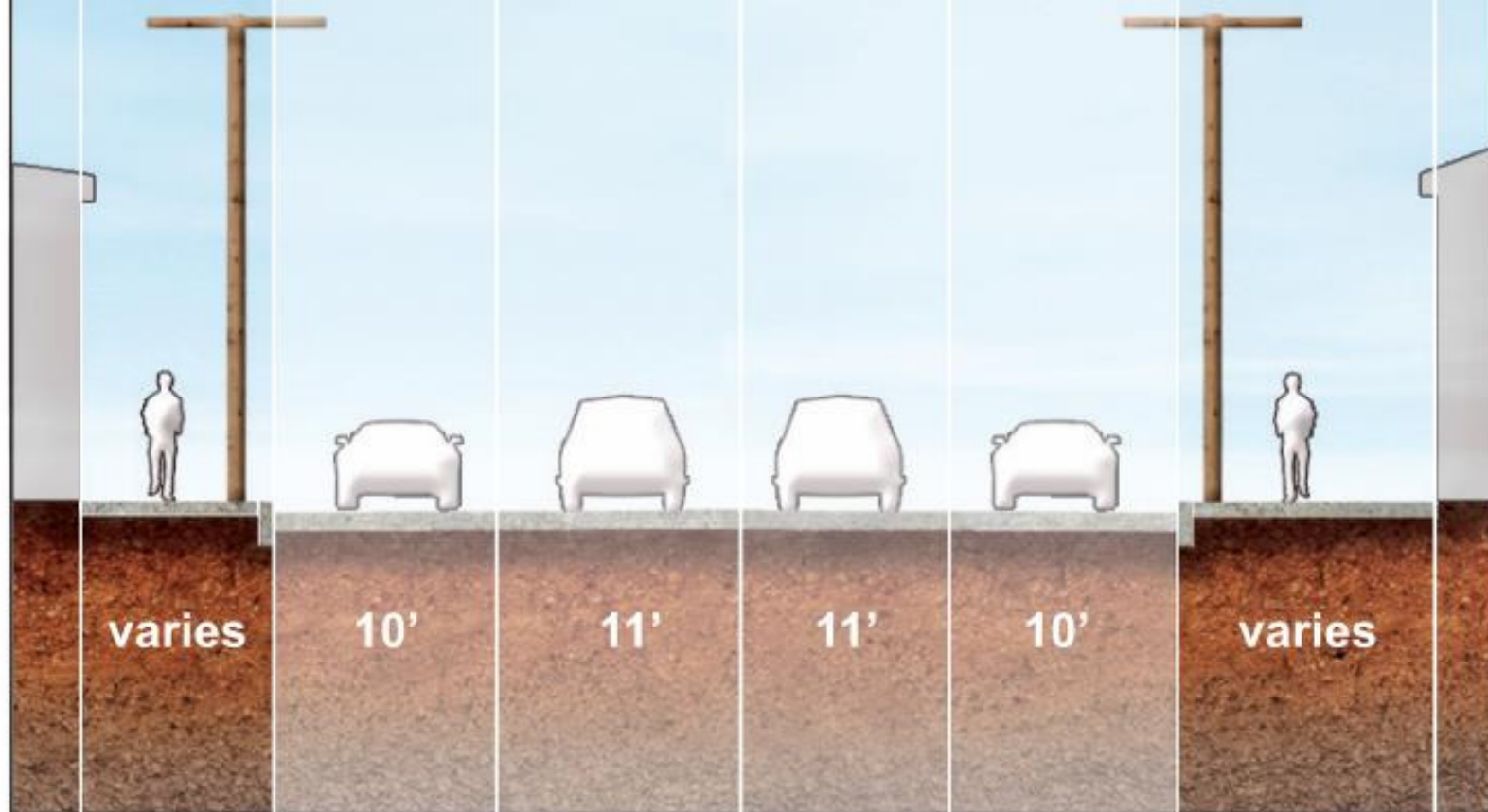


**ROAD RECONFIGURATION  
LASALLE ST.  
PROPOSED**



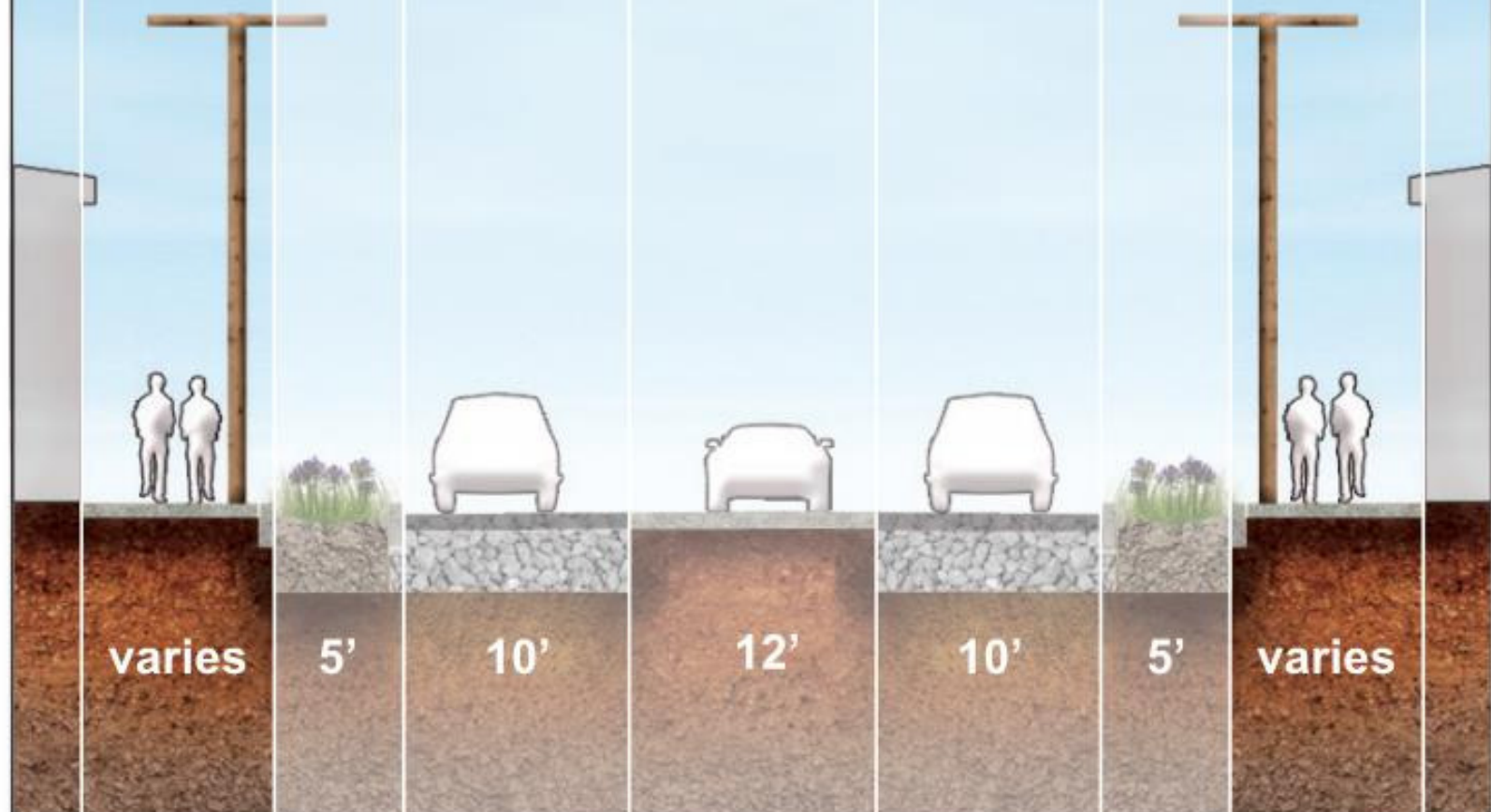


**ROAD RECONFIGURATION  
BARONNE STREET**  
EXISTING



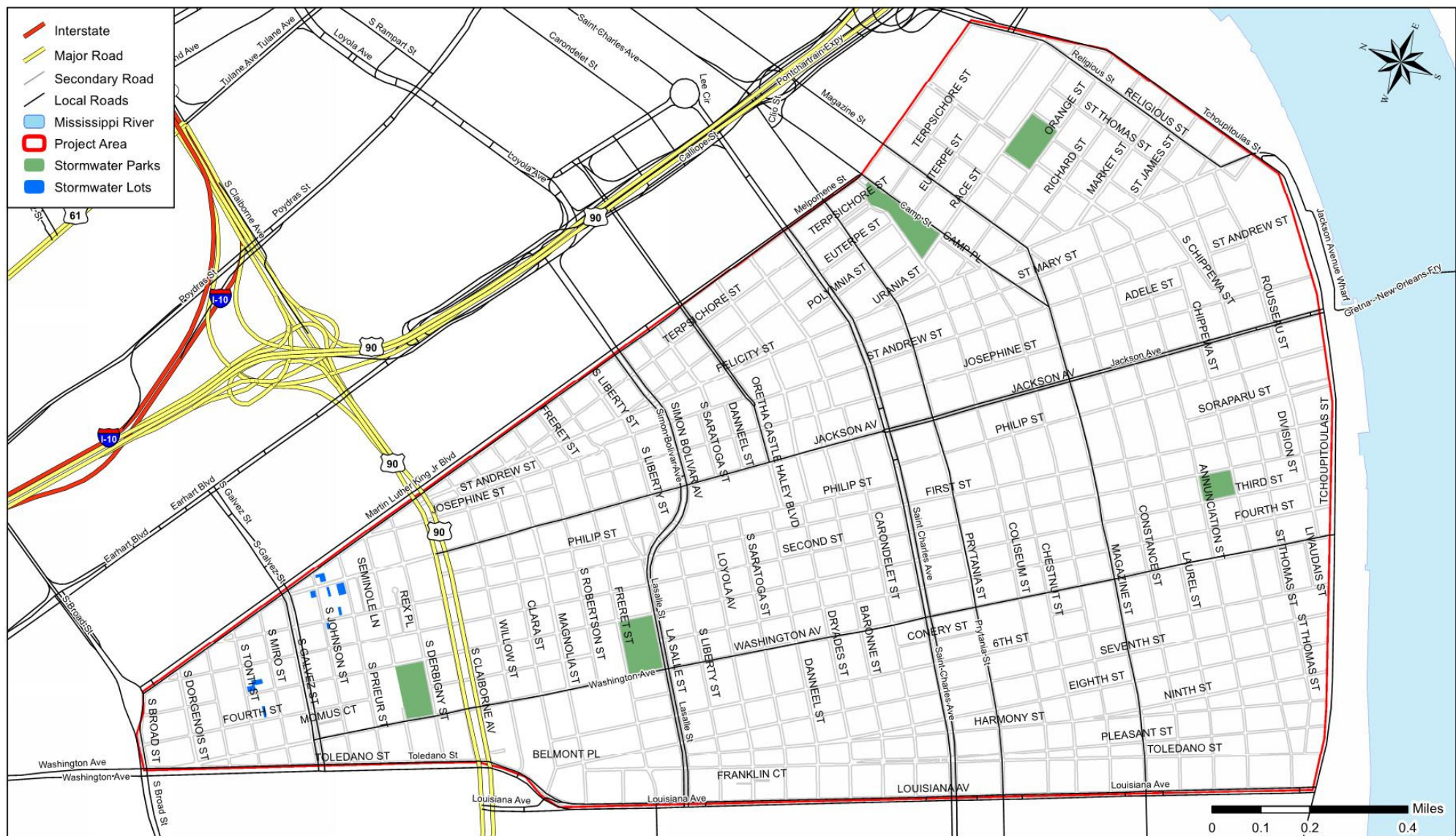


**ROAD RECONFIGURATION  
BARONNE STREET  
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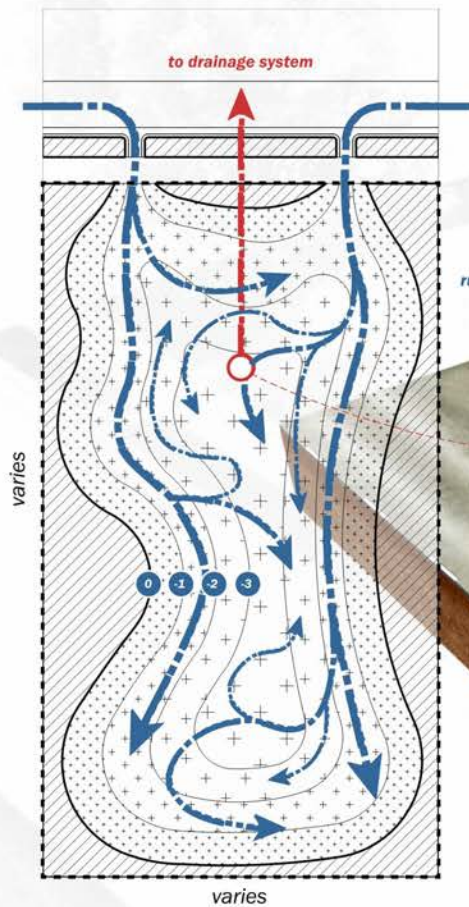


# Stormwater Lots and High Performance Fields



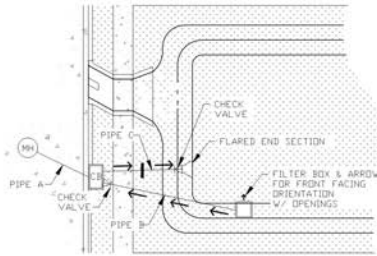


# GREEN INFRASTRUCTURE FACILITY STORMWATER LOT



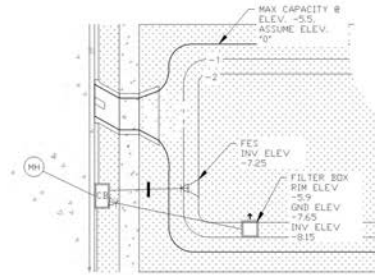
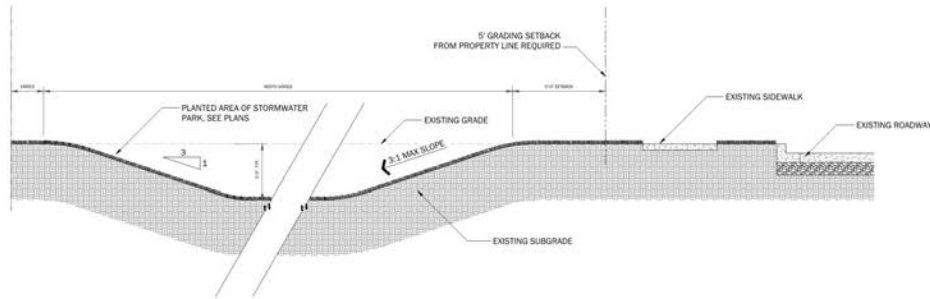
7. PIPE "A" - CONNECTS EXISTING OR PROPOSED MANHOLE (MH) TO NEW CATCH BASIN (CB). THE CITY OF NEW ORLEANS & SEWERAGE & WATER BOARD STANDARDS SHALL APPLY.

1. PIPE "A" - CONNECTS EXISTING OR PROPOSED MANHOLE (MH) TO NEW CATCH BASIN (CB). THE CITY OF NEW ORLEANS & SEWERAGE & WATER BOARD STANDARDS SHALL APPLY.
2. PIPE "B" - CONNECTS EXISTING/NEW CATCH BASIN TO NEW FILTER BOX. PIPE B WILL ALLOW WATER TO GRAVITY DRAIN OUT OF THE LOT INTO THE DRAINAGE SYSTEM.
3. PIPE "C" - CONNECTS EXISTING/NEW CATCH BASIN TO A NEW FLARED END SECTION (FES) WHEN THE LOT. PIPE C WILL USE HYDRO STATIC PRESSURE FROM THE DRAINAGE SYSTEM TO FORCE WATER INTO THE LOT AGAINST GRAVITY.
4. CHECK VALVES - THESE ARE LOCATED ON BOTH PIPES "B" AND "C". THESE ALLOW WATER TO FLOW ONLY ONE DIRECTION THROUGH THE PIPE. THE DIRECTION IS CRITICAL.

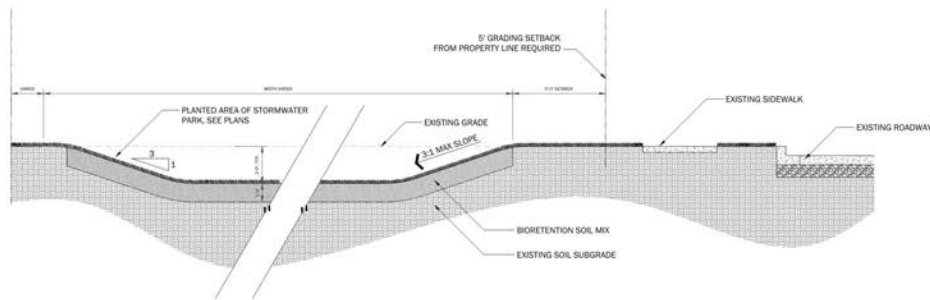


1. FLARED END SECTION (FES) - THE INVERT ELEVATION IS ALWAYS +0.2' RELATIVE TO THE FILTER BOX GROUND ELEVATION.

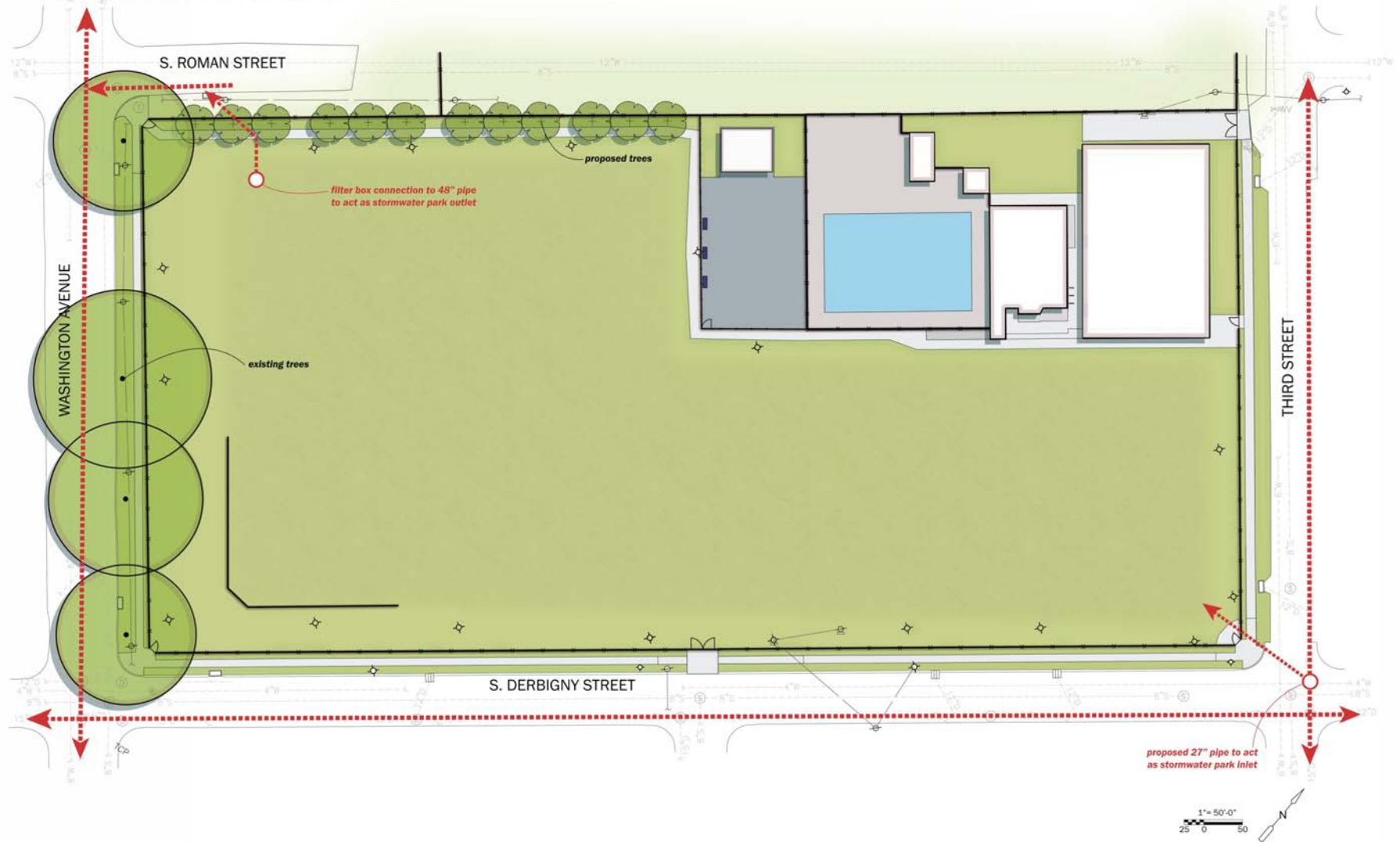
1. **FLARED END SECTION (FEES)** - the INVERT ELEVATION is ALWAYS +0.0' RELATIVE TO THE FILTER BOX GROUND ELEVATION.
2. **GROUND ELEVATION (GND)** - this is the LOWEST POINT in the SHOWER LOT. ALL WATER MUST DRAIN TO THIS POINT. the GND ELEVATION is a MIN. of +0.05' ABOVE THE FILTER BOX INV. ELEVATION.  
**FILTER BOX INV. ELEV.** - this ELEVATION is ALWAYS -0.05' THAN the CB ELEV. TO ENSURE POSITIVE DRAINAGE.
3. **BIM ELEVATION** - this FILTER BOX ELEVATION is ALWAYS -0.4' RELATIVE TO the RUNNEL ELEVATION.
5. **RUNNEL ELEVATION** - this ELEVATION REPRESENTS the MAXIMUM WATER LEVEL & OTHER CONTROLS OF THIS SYSTEM. this ELEVATION is ASSUMED "0" WHEN EXCAVATING the LOT. the EXAMPLE ASSUMES this TO BE -5.5'

 $\Gamma = 10$ 

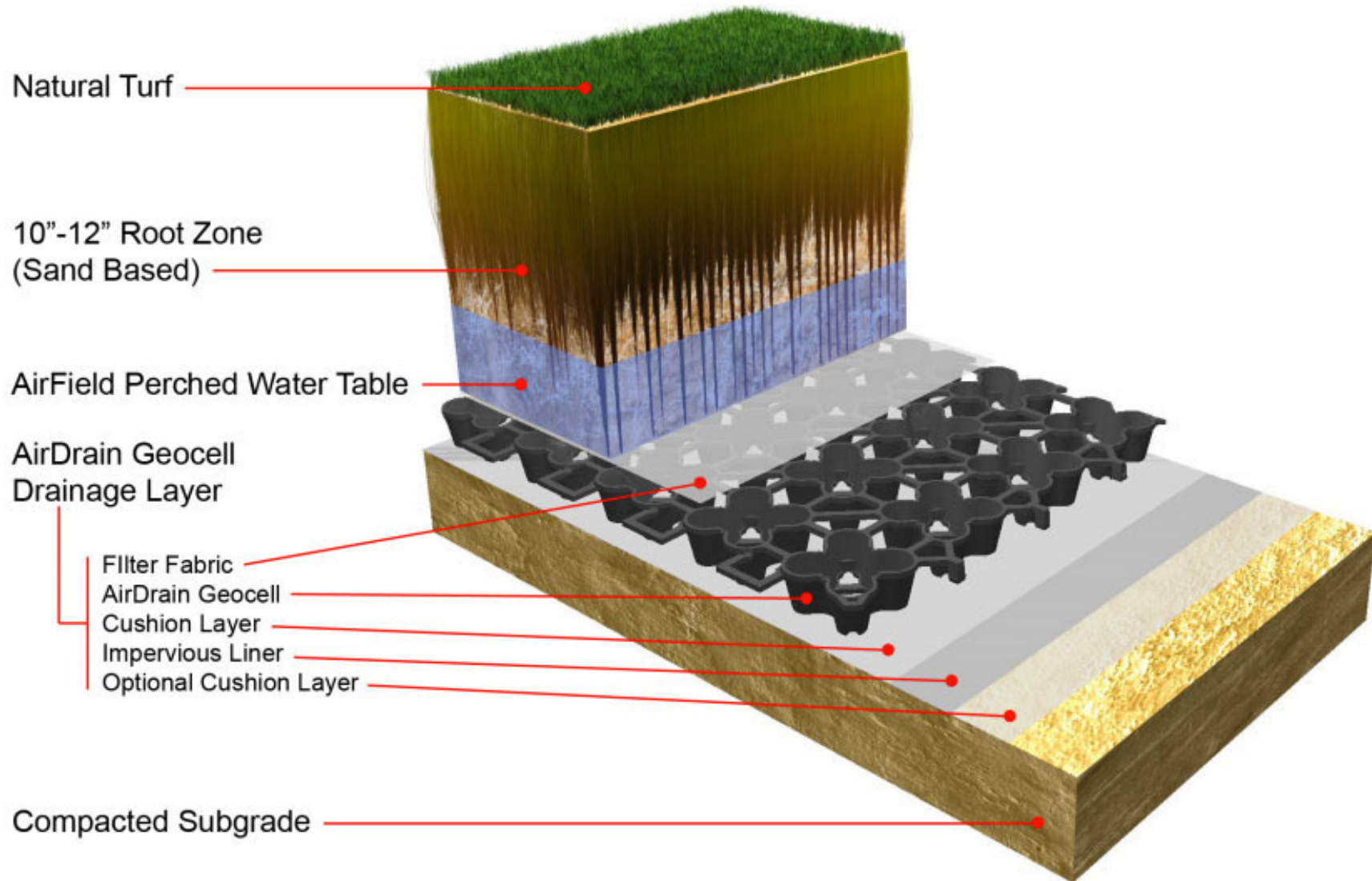
②

 $1.5 \times 10^6$

# **GREEN INFRASTRUCTURE FACILITY** TAYLOR PLAYGROUND: STORMWATER PARK

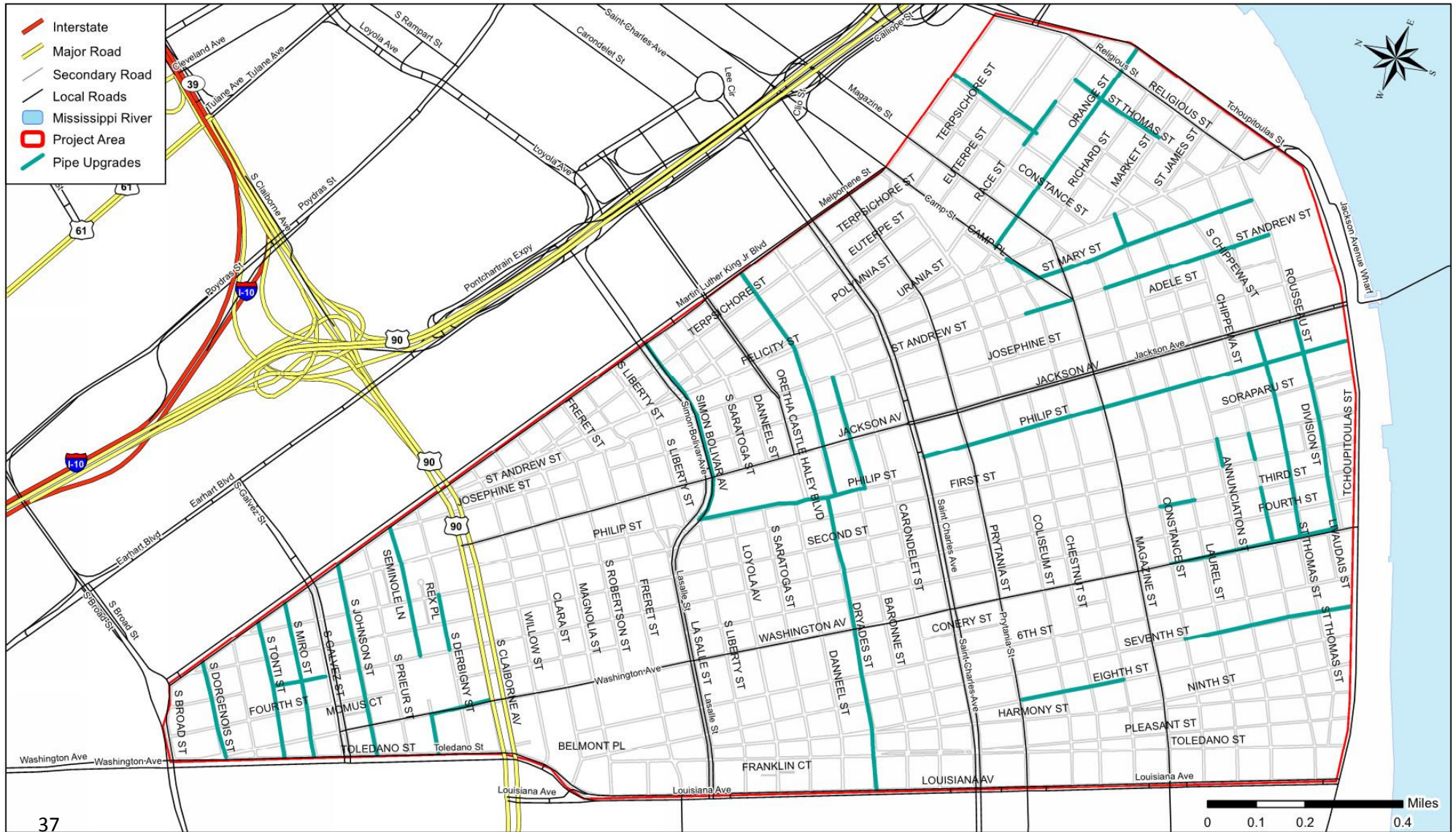




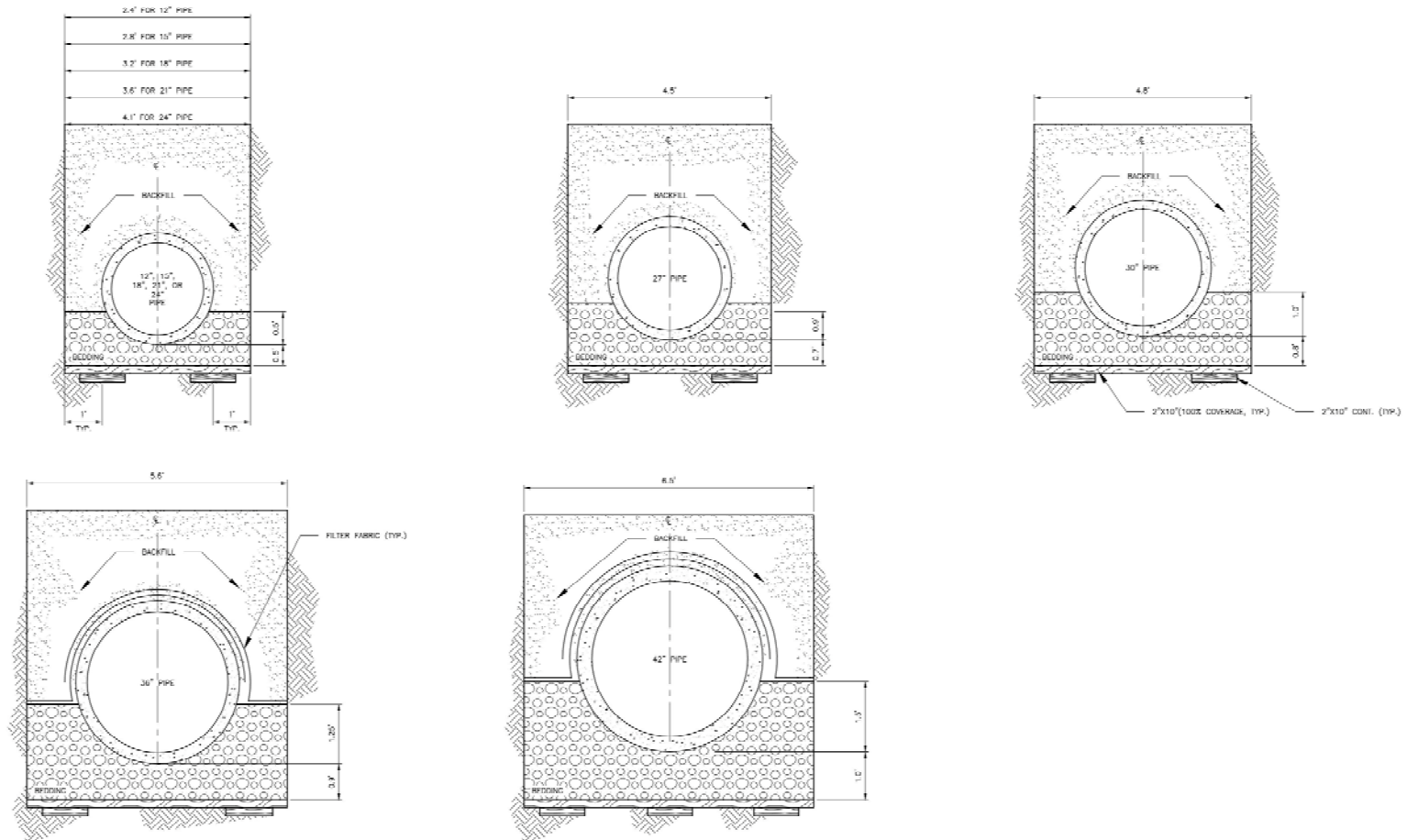


# Pipe Installation and Upgrades









CONCRETE PIPE BEDDING SECTIONS FROM 12" TO 42"  
SCALE: N.T.S.

# Project Benefits



# Proposed System Benefits

- Reduced flooding risk across all modeled storm events
- Improved water quality discharged from the area
- Reduced level of imperviousness

Post Improvements Damages

Design Storm	Buildings in Flooded Areas	Parcels in Flooded Areas	Flooded Roadways (mi)
1-Year Storm	145	256	1.1
2-Year Storm	755	1385	6.1
5-Year Storm	2296	3782	25.7
10-Year Storm	3676	5503	45.8
100-Year Storm	6599	7691	76.1

Reduced Damages

Design Storm	Buildings in Flooded Areas	Parcels in Flooded Areas	Flooded Roadways (mi)
1-Year Storm	452 (75.7%)	766 (75.2%)	3.9 (78%)
2-Year Storm	762 (50.2%)	1209 (46.6%)	8.9 (59.3%)
5-Year Storm	852 (27.1%)	1065 (22%)	10 (28%)
10-Year Storm	699 (16%)	782 (12.4%)	8.5 (15.7%)
100-Year Storm	226 (3.3%)	109 (1.4%)	1.6 (2.1%)



# Questions/Discussion

