



**Drainage Pump Station 01 Watershed
(Broadmoor) Drainage Upgrades
and Green Infrastructure Project
90% Design**

Resilience Project Design Review Committee

City of New Orleans

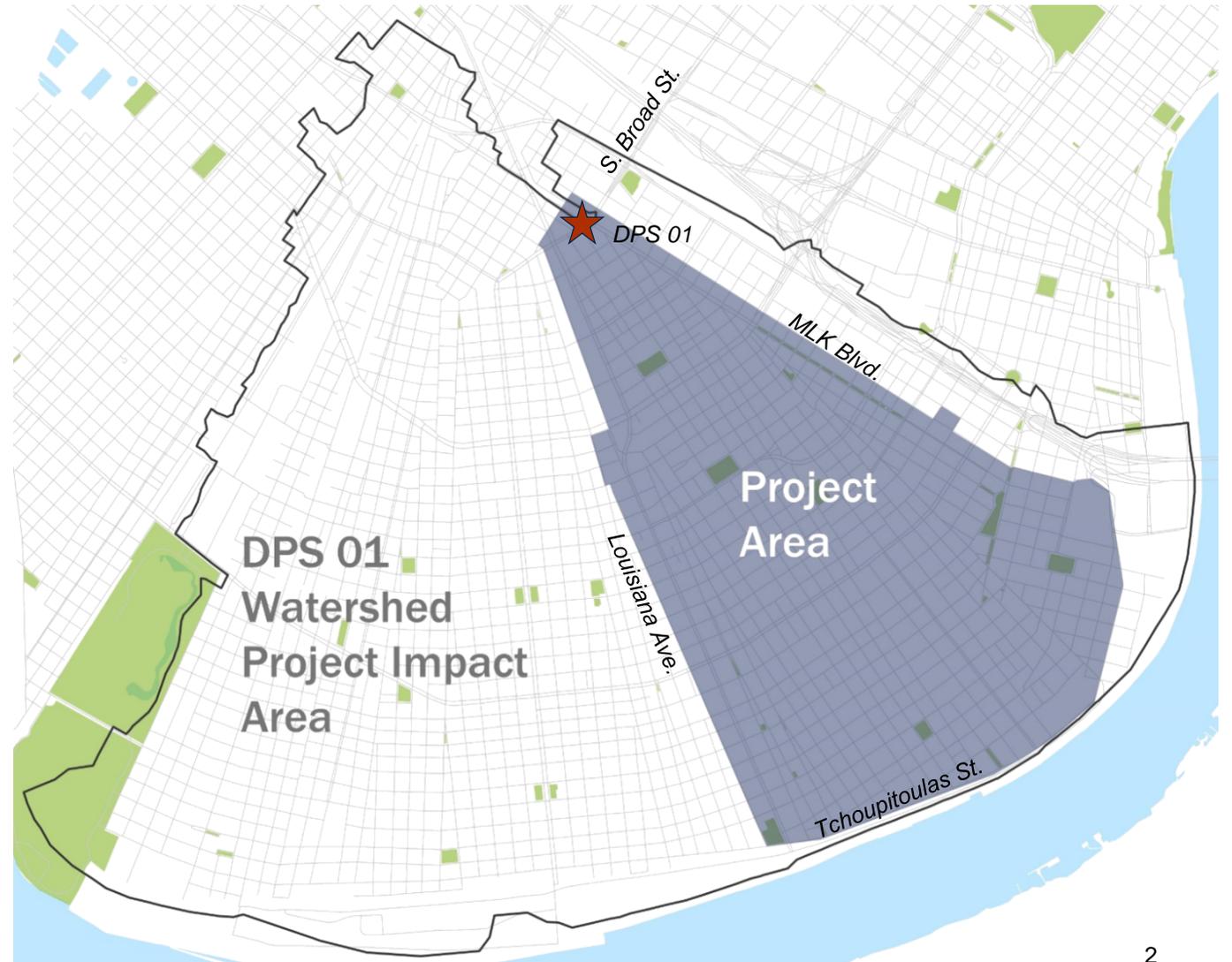
April 11, 2019

Agenda

- I. Project Information
- II. Existing Conditions & Stormwater Management Strategy
- III. Plan Changes
- IV. Project Benefits
- V. Timeline
- VI. Questions/Discussions

Project Information

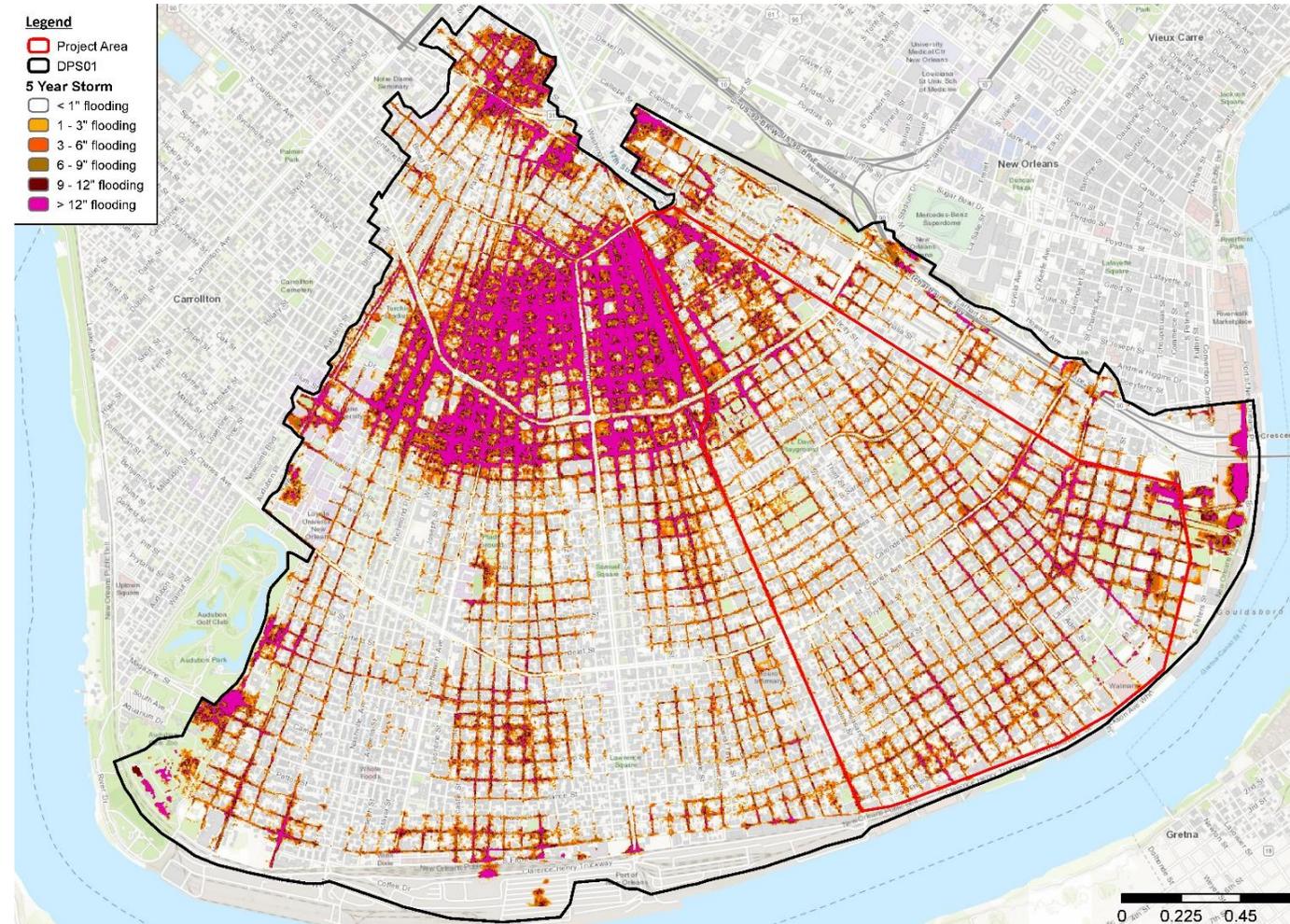
- Project Team
 - CDM Smith
 - Dana Brown & Associates
 - Digital Engineering
- Project Boundaries
 - Toledano/Louisiana, S. Broad, Melpomene/MLK, Tchoupitoulas
 - Nearly 1,800 acres



Existing Flooding Potential Damages

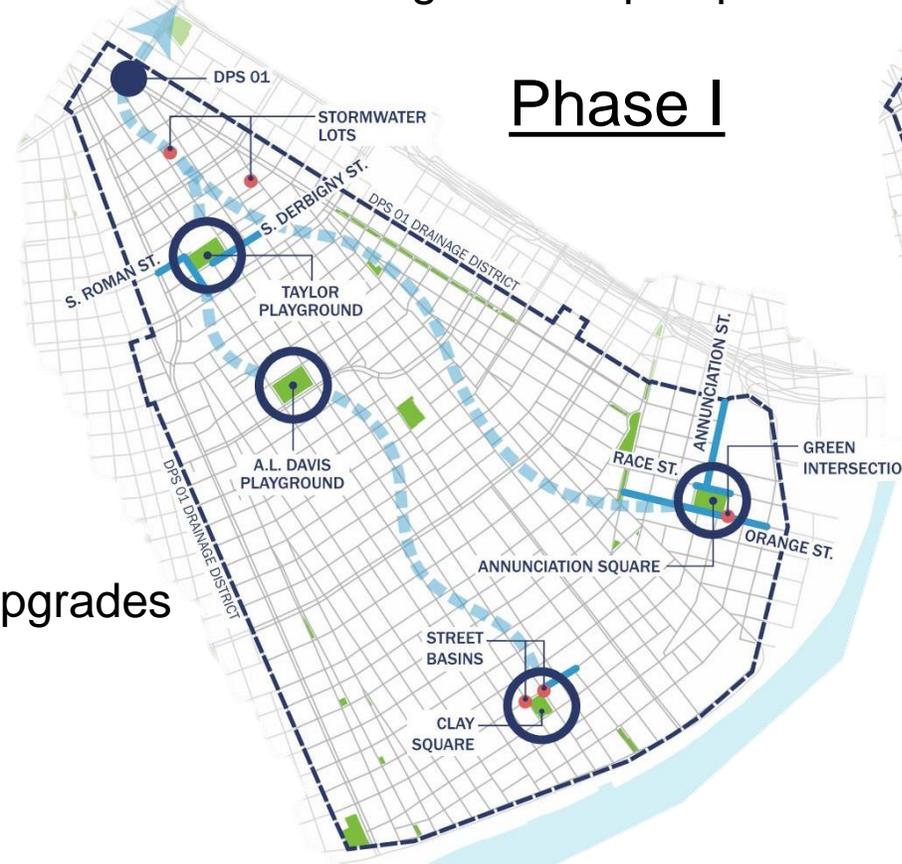
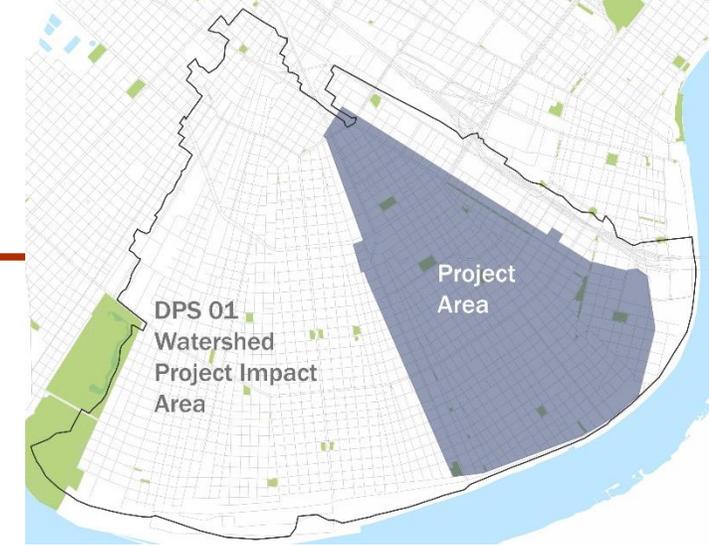
- Model showed
 - localized flooding during 1-yr & 2-yr storms
 - wide-spread flooding during 5-yr & 10-yr storms
- DPS01 pump capacity limited to 5,700 CFS due to downstream flow restrictions
- Potential Damages
 - Impassable Roads
 - Flooded Buildings
 - Citizens at Risk

Design Storm	Buildings Flooded >18"	Roads Flooded >6" (Mi)
1-Year	21	2.5
2-Year	123	25.0
5-Year	1392	64.8
10-Year	3510	106.8

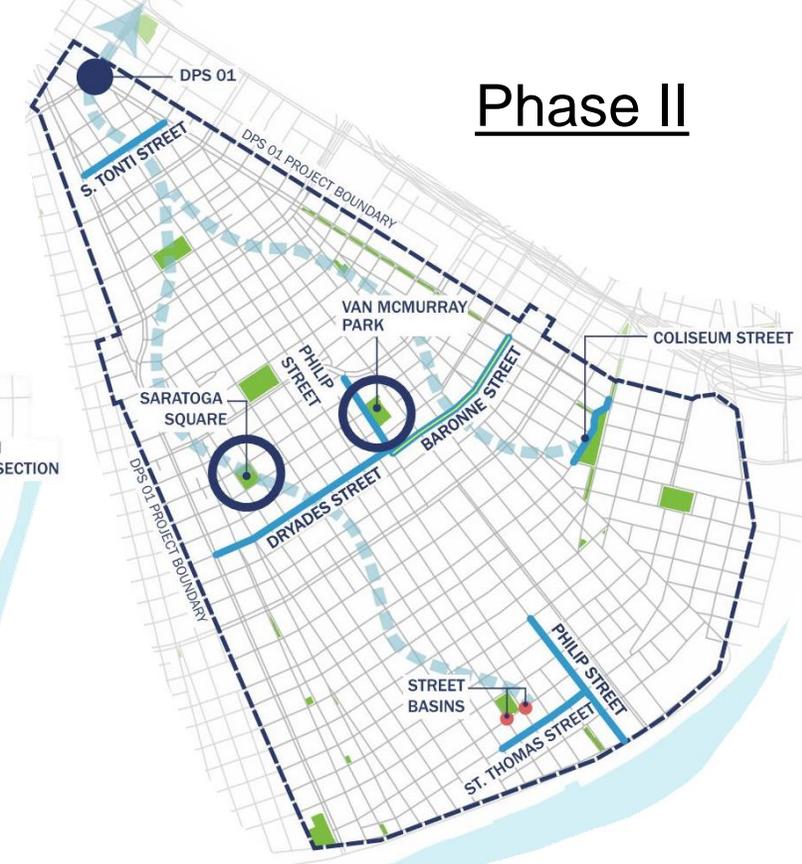


Strategy & Proposed Solutions

- Green infrastructure
 - Will temporarily capture stormwater runoff at higher ground near the River
- Pipe upgrades
 - Will increase the amount of stormwater that can get to the pump station & outfall canals
- Phase I:
 - 4 Stormwater Parks
 - 2 Stormwater Lots
 - 3 Green Intersections
 - Associated Pipe Upgrades
- Phase II:
 - 2 Stormwater Parks
 - 2 Green Intersections
 - 6 Complete Streets & Pipe Upgrades



Phase I

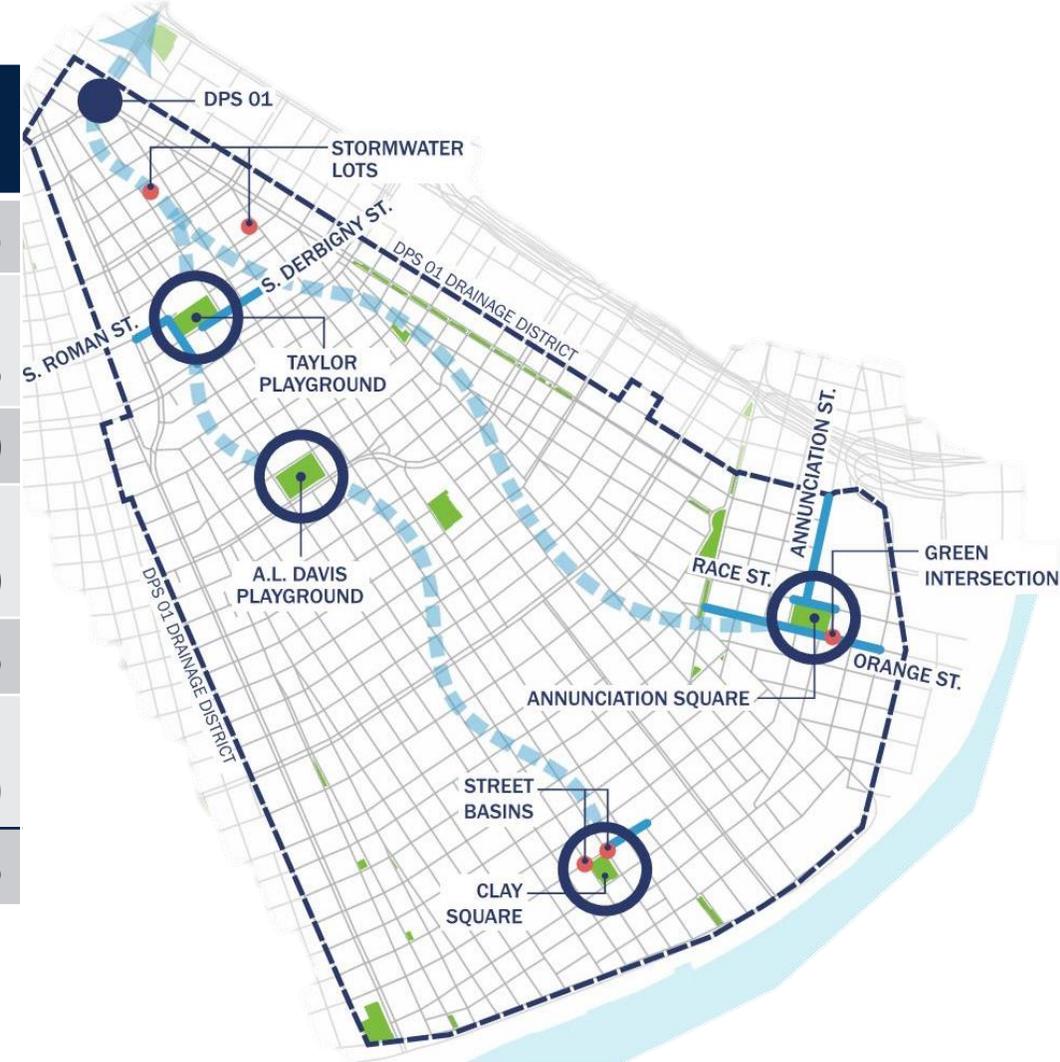


Phase II



Stormwater Parks 60% to 90% Changes

Phase	Stormwater Park	60% Volume (CF)	90% Volume (CF)	Difference (CF)
I	Taylor Park	306,875	291,950	-14,925
	A.L. Davis Playground	242,300	250,105	7,805
	Clay Square	107,080	108,310	1,230
	Annunciation Square	220,110	230,000	9,890
II	Van McMurray	126,800	121,415	-5,385
	Saratoga Square	142,000	142,000	0
	Total	1,145,165	1,143,780	-1,385



Green Intersections 60% to 90% Changes

Phase	Green Intersections	60% Volume (CF)	90% Volume (CF)	Difference (CF)
I	Annunciation at 2 nd	2,475	7,325	4,850
	Annunciation at 3 rd	2,295	8,785	6,490
	St. Thomas at Orange**	1,390	6,215	4,825
II	Chippewa at 2 nd	8,150	5,420	-2,730
	Chippewa at 3 rd	8,150	6,770	-1,380
	Total *	22,460	34,515	3,260 *



* Phase I Green Intersections reduced from 8 to 3. Total volume increased from 13,530 CF to 22,325 CF.

** Green Intersection in industrial area includes permeable pavers only, no street basins.

Complete Streets 60% to 90% Changes

Phase	Complete Street	60% Volume (CF)	90% Volume (CF)	Difference (CF)
I	Annunciation (Race to Melpomene)	36,750	34,530	2,220
II	Baronne (Philip to MLK)	196,500	179,480	-17,020
	St. Thomas (Washington to Philip)	77,100	46,680	-30,420
	Philip (Constance to Tchoupitoulas) *	136,400	120,600	-15,800
	Coliseum (Race to Melpomene)	27,100	28,410	1,310
	Total	437,100	409,700	-64,150



❖ Associated pipes changed from dual 24" RCP to single 30" RCP

Drainage Pipe 60% to 90% Changes

Phase	Pipe Location	Changes
I	S. Roman (Toledano to Washington)	Reduced from Dual 42" RCP to Single 42 RCPA
	Washington (S. Roman to S. Claiborne)	No Significant Change
	Annunciation (2 nd to 1 st)	No Significant Change
	Race (Annunciation to Chippewa)	Reduced from Single 48" RCPA to Single 36" RCP
	Orange (Camp to Tchoupitoulas)	Reduced from Single 48" RCP to Single 36" RCP with existing 21" RCP to remain
II	S. Tonti (Toledano to MLK)	No Significant Change
	Philip (Simon Bolivar to Baronne)	No Significant Change
	Dryades (Louisiana to 3 rd)	Changed 36" RCP to 36" RCPA
	Dryades (3 rd to Philip)	Changed 42" RCP to 42" RCPA
	Chippewa (3 rd to Washington 2 nd to 1 st)	Changed 24" RCP to 24" RCPA

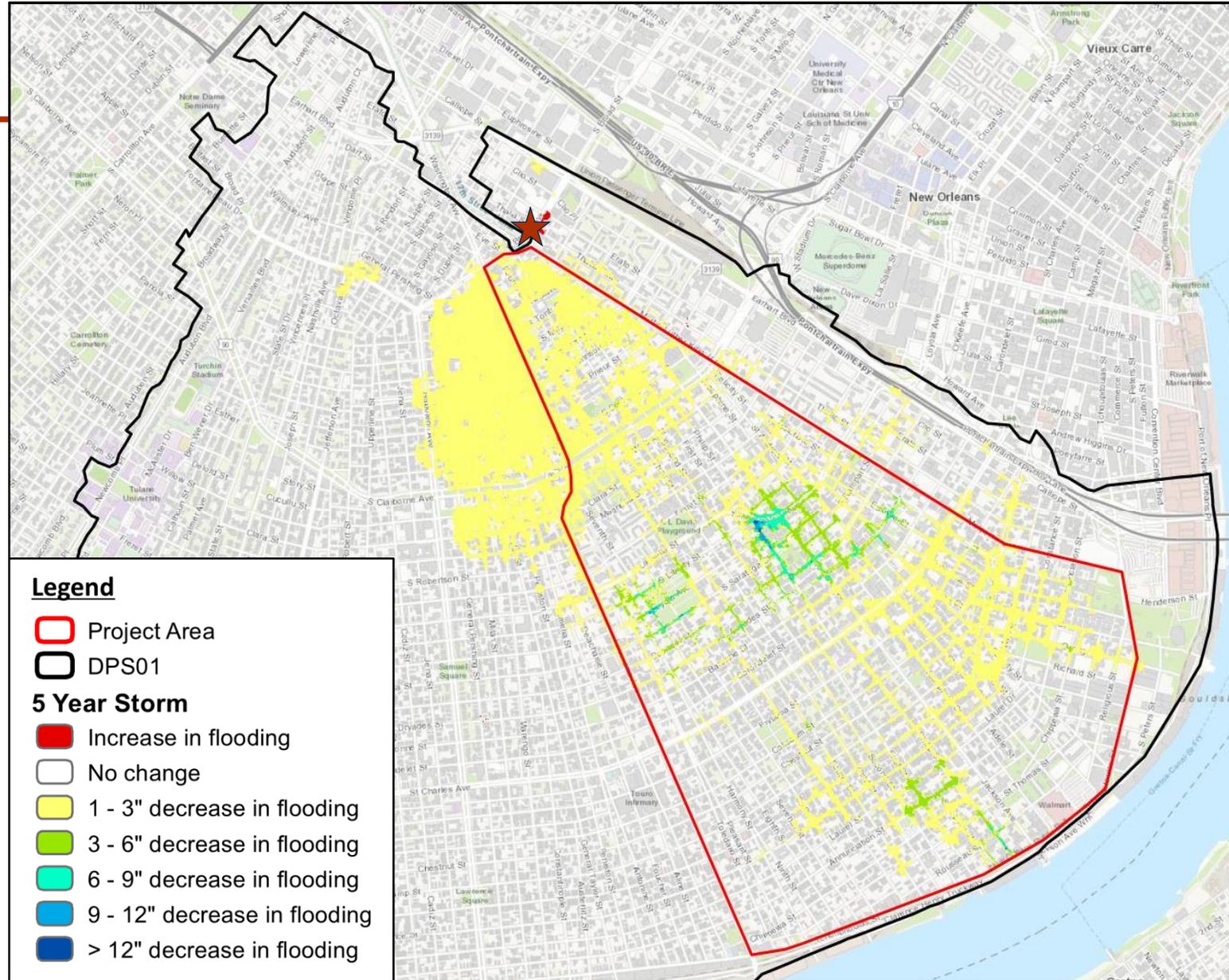
Opinion of Probable Construction Costs

Phase I		
Item	Subtotal - Construction	Cost of Storage / CF
Stormwater Lots	\$183,900	\$4.65
Stormwater Parks	\$14,934,000	\$16.49
Green Intersections	\$817,800	\$36.63
Complete Streets	\$1,508,700	\$41.05
Stormwater Drainage Upgrades	\$5,105,600	\$925.76
Total	\$22,550,000	

Phase II		
Item	Subtotal - Construction	Cost of Storage / CF
Stormwater Parks	\$3,283,000	\$12.46
Green Intersections	\$337,000	\$31.55
Complete Streets	\$15,978,000	\$42.59
Stormwater Drainage Upgrades	\$5,239,000	\$738.62
Total	\$24,837,000	

Project Benefits

- Additional storage created in the watershed
 - Phase I: 937,220 CF
 - Phase II: 649,265 CF
- Major drainage pipes upgraded
 - Phase I: 5,515 LF
 - Phase II: 7,093 LF



Project Timeline

- Construction Documents Completed by end of June 2019
- Bidding by Winter 2020
- Construction (Both Phases Concurrent):
 - Parks & Surrounding Streets: 8 to 12 months
 - Green Intersections: 1 to 3 months
 - Complete Streets: 18 to 22 months
 - Pipe Upgrades: 9 to 18 months
 - Total Construction: 24 to 28 months
- Construction Timeline Windows (Stormwater Parks)

Stormwater Park Construction Windows

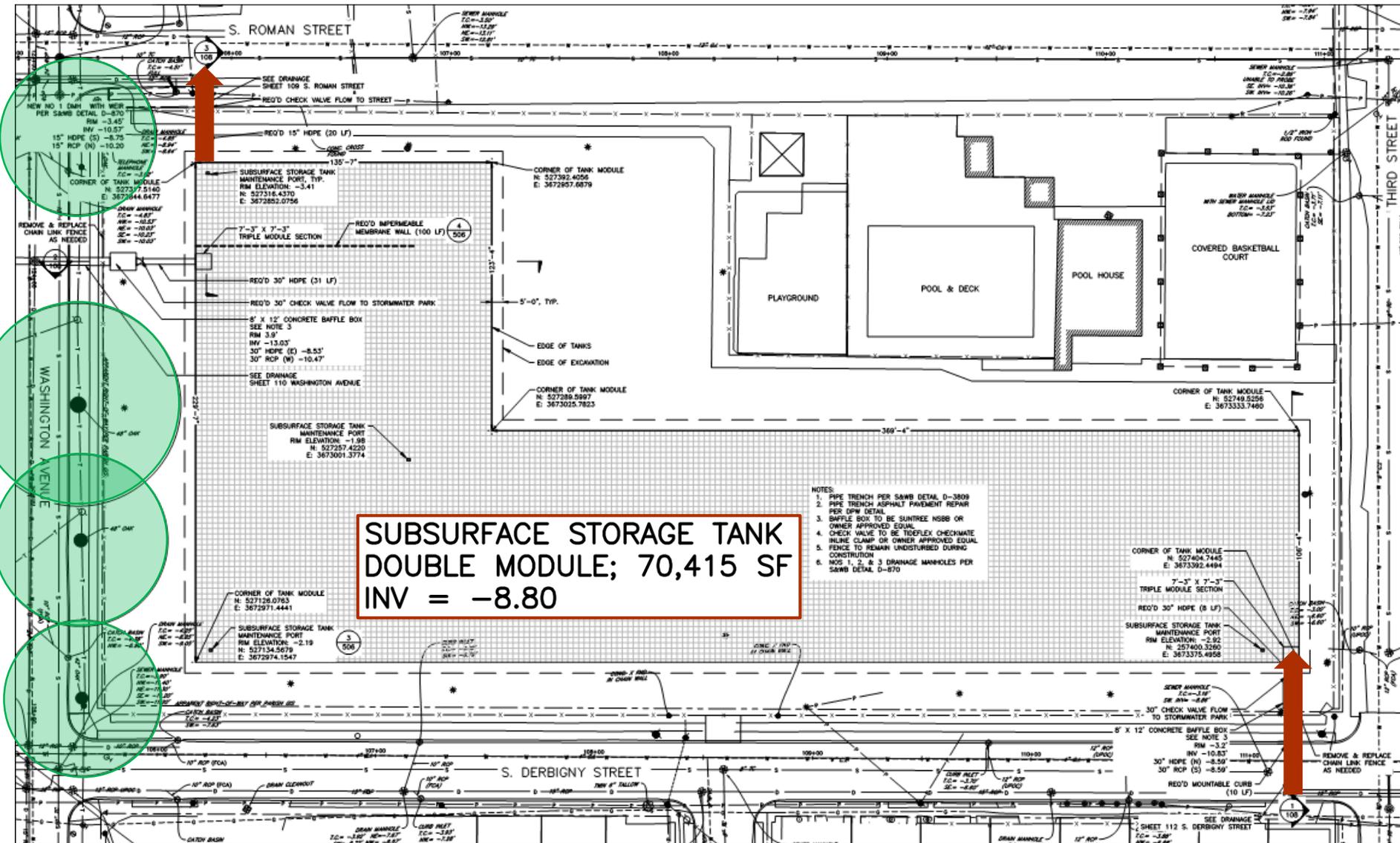
- Taylor Park: March 2020 to January 2021 (10 months)
- Clay Square: April 2020 to February 2021 (10 months)
- Annunciation Square: No limitations
- Van McMurray: Coordinate with school – focus summer months
- Saratoga Square: No limitations
- A.L. Davis Playground: December 2020 to March 2021
(3 months. Very Limited Window – significant coordination needed with regards to installation of subsurface storage and establishment of turf grass)

Questions & Discussion

Additional Slides for Discussion

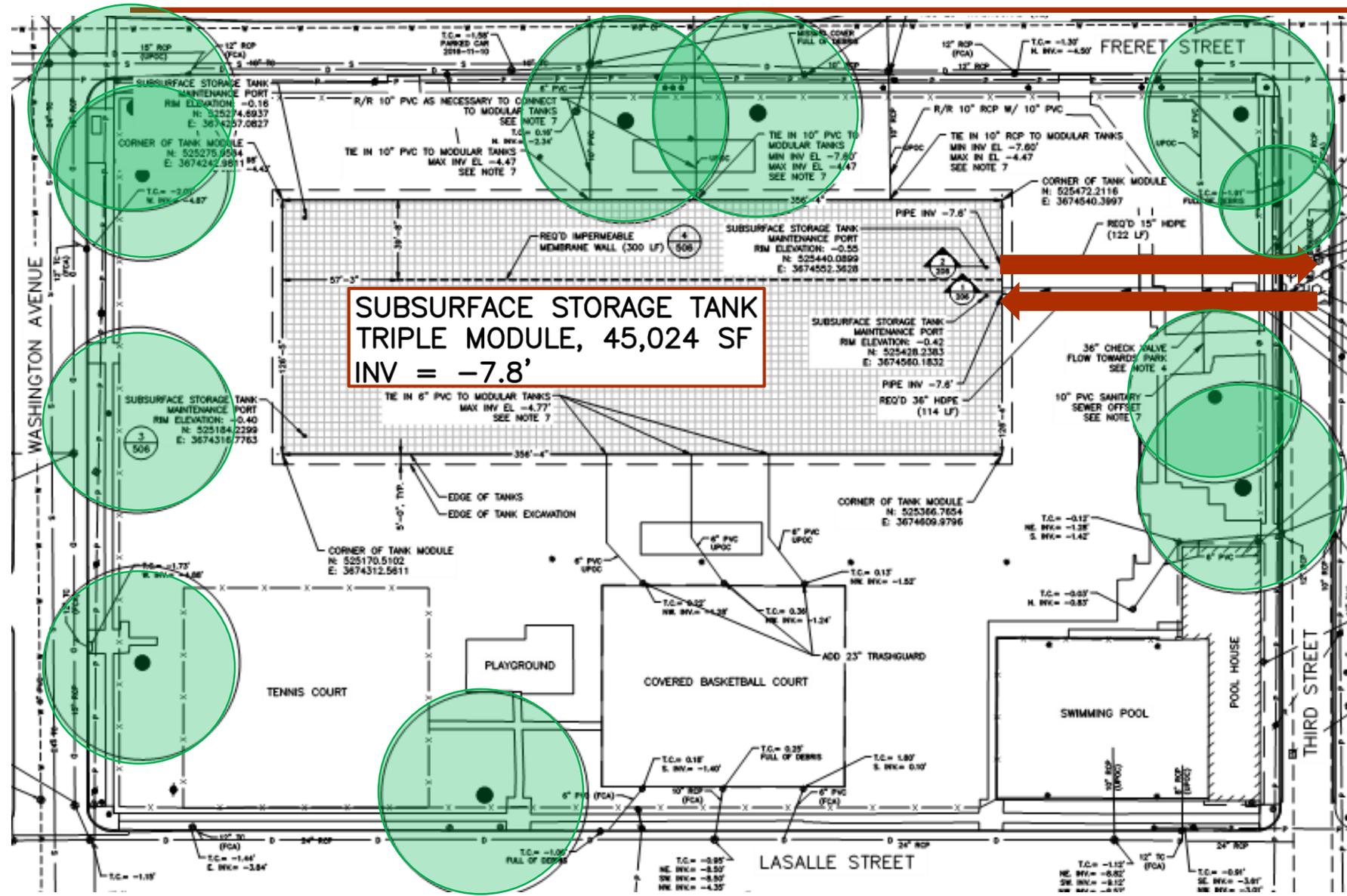
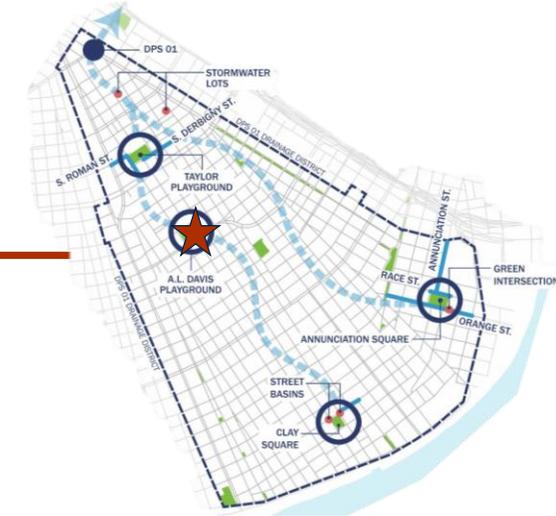
Stormwater Parks

Stormwater Parks: Taylor Playground



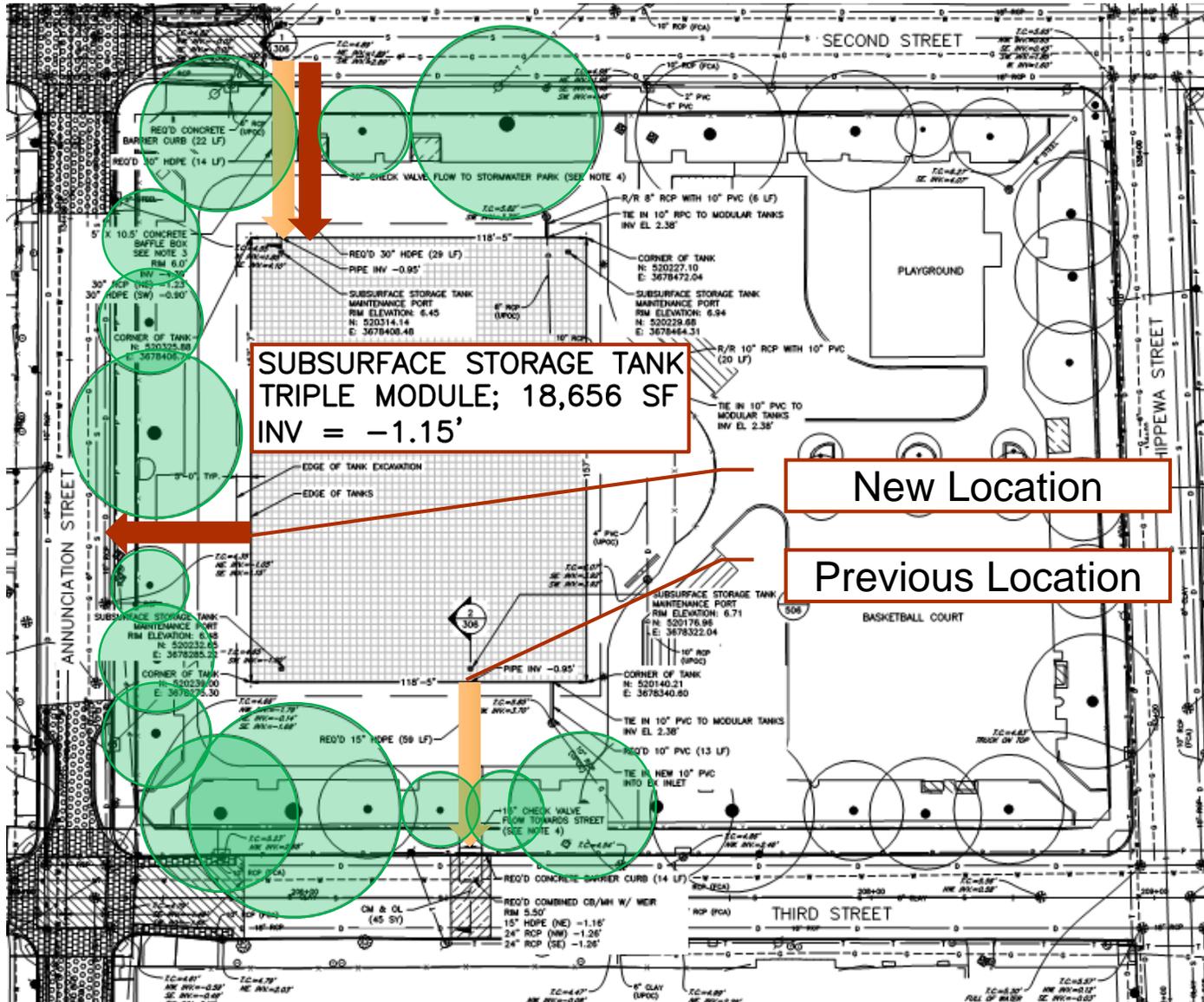
- 291,950 CF of Storage
- Cost: \$4,757,500
- Unit Cost: \$16.30/CF

Stormwater Parks: A.L. Davis Park



- 250,105 CF of Storage
- Cost: \$4,059,500
- Unit Cost: \$16.23/CF

Stormwater Parks: Clay Square



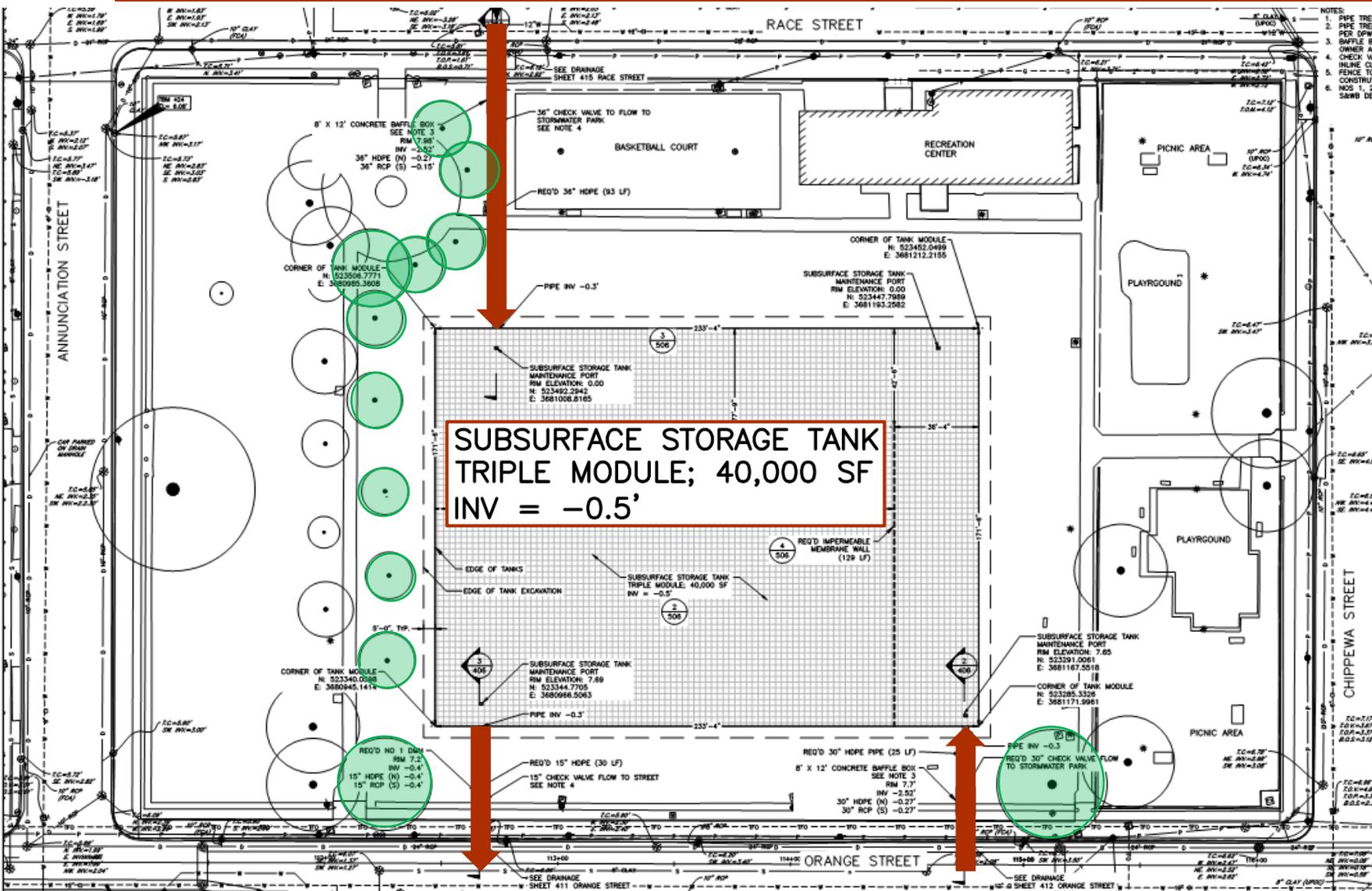
SUBSURFACE STORAGE TANK
TRIPLE MODULE; 18,656 SF
INV = -1.15'

New Location

Previous Location

- 108,310 CF of Storage
- Cost: \$1,746,700
- Unit Cost: \$16.13/CF

Stormwater Parks: Annunciation Square



- 255,465 CF of Storage
- Cost: \$4,370,300
- Unit Cost: \$17.11/CF

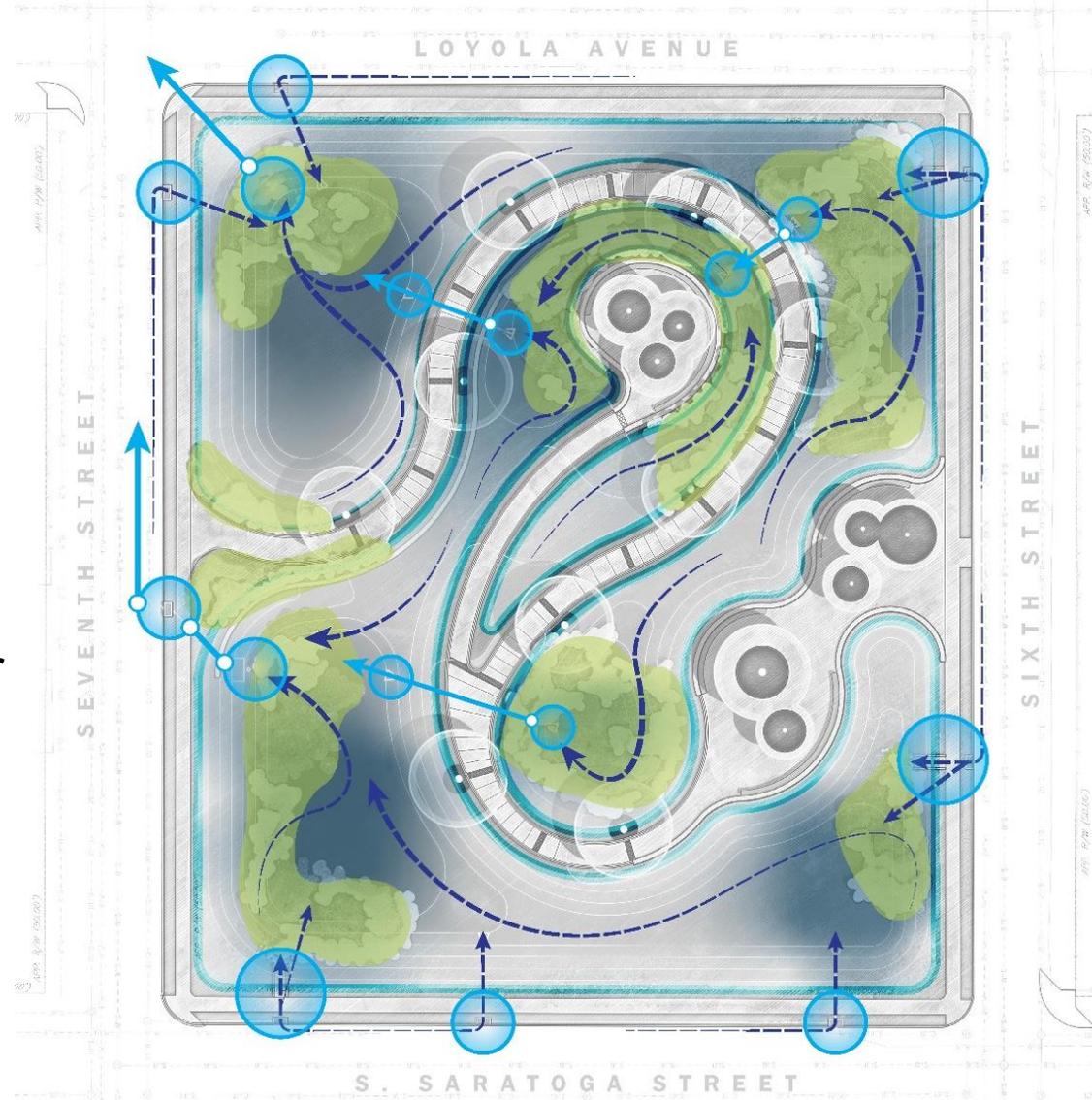
Stormwater Parks: Van McMurray

- Van McMurray Park
 - 121,415 CF of Storage
 - 33,000 SF footprint
- Subsurface Storage Tanks (3 layers)
- Cost: \$2,002,000
- Unit Cost: \$16.49/CF
- FEMA funds will only cover stormwater management improvements



Stormwater Parks: Saratoga Square

- Saratoga Square
 - 142,000 CF of Storage
 - 75,000 SF footprint
- No Standing Water After 24 Hrs
- Cost: \$1,281,000
- Unit Cost: \$9.02/CF
- FEMA funds will only cover stormwater management improvements



- No areas of significant subsurface storage
- Planting and interior sidewalks included
- No lighting, benches, or other ancillary items included
- Perimeter sidewalks to be renovated

Green Intersections

Green Intersections: Street Basins

- Four intersections will be redesigned with Street Basins, Pervious Crosswalks, and Pervious Gutters
- Average Unit Cost: \$34.46/CF
- Turning Radius completed for Fire Truck
- Average area of permeable surface: 285 SY



Complete Streets

Complete Streets & Pipe Upgrades

Complete Streets

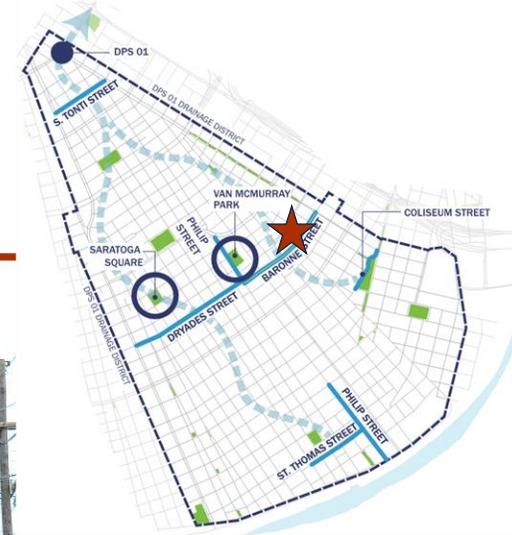
- Five streets will be redesigned to incorporate subsurface storage, upgraded drainage pipes, pervious pavements, and an urban bioswale
 - Annunciation
 - Baronne Street (urban bioswale)
 - St. Thomas Street
 - Philip Street (Upper)
 - Coliseum Street
- Demonstrate the effectiveness of grey and green infrastructure working together

Pipe Upgrades

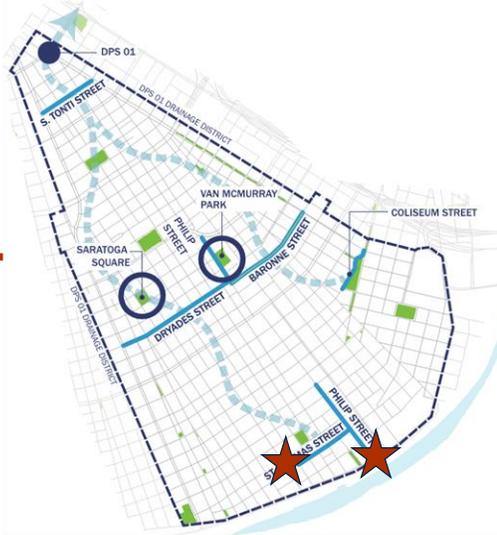
- Ten Streets will have upgraded drainage infrastructure
- Focused on directing water to and from Stormwater Parks
 - S. Roman Street
 - S. Derbigny Street
 - Annunciation Street
 - Washington Ave.
 - Race Street
 - Orange Street
- Focused on adding paths & equalizing the water among the major stormwater boxes on Louisiana, Third, & MLK Jr. Blvd.
 - Chippewa Street
 - Philip Street (Lower)
 - Dryades Street
 - S. Tonti Street

Complete Streets: Baronne Street

- From MLK Blvd. to Philip St.
 - Pervious paver gutters
 - Pipe upgrade (42" RCPA)
 - Protected pervious asphalt bike lane
 - Subsurface storage aggregate
 - Urban bioswale
- Storage: 179,480 CF
- Bioswale Area: 13,500 LF
- Length: 2,650 LF
- Cost: \$7,198,000
- Unit Cost: \$40.10/CF



Complete Streets: St. Thomas St / Philip

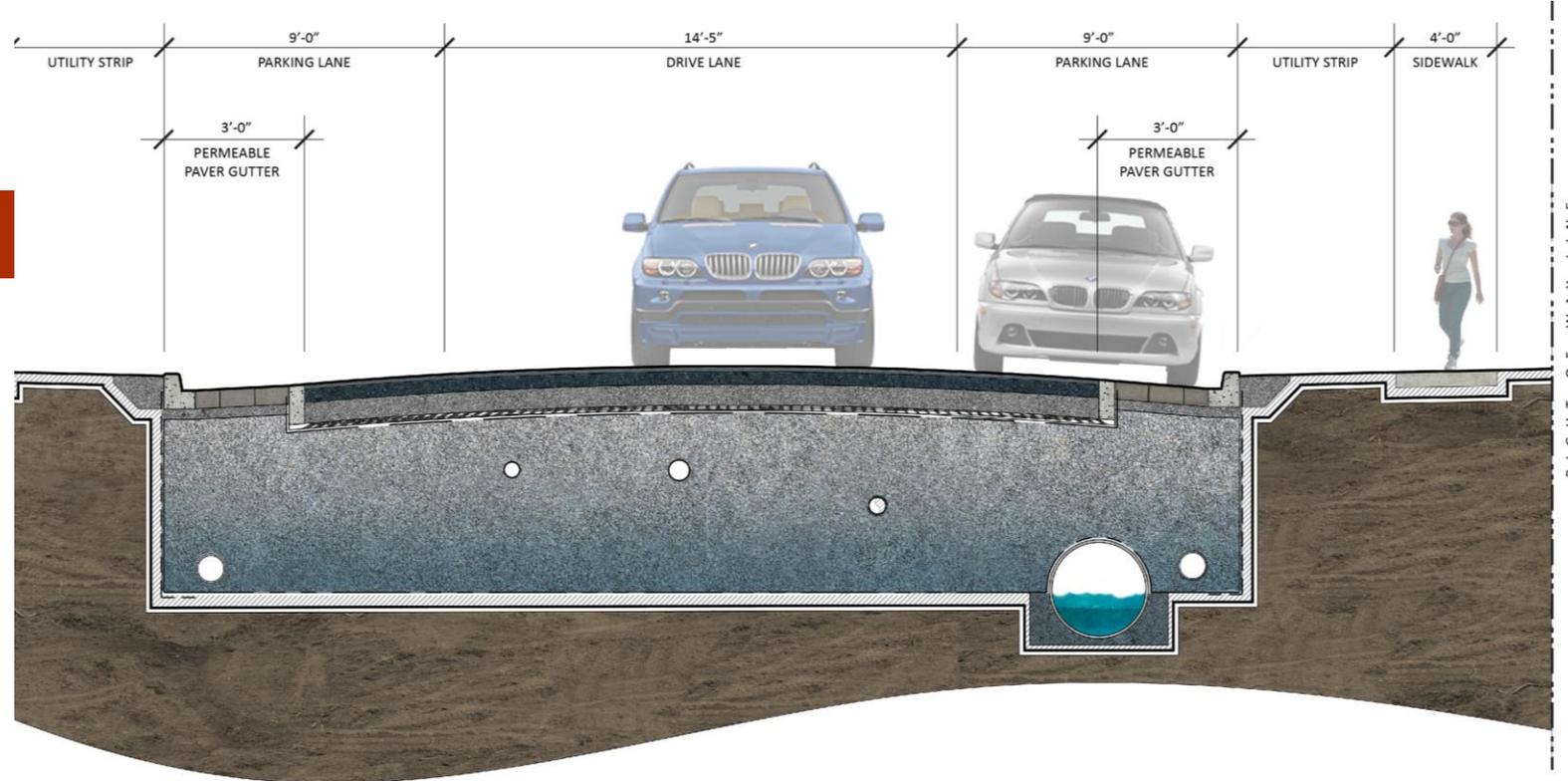


St. Thomas Street

- Washington Ave. to Philip St.
 - Pervious paver gutters / agg storage
- Storage: 48,680 CF
- Length: 1,940 LF
- Cost: \$2,449,000 (\$52.46/CF)

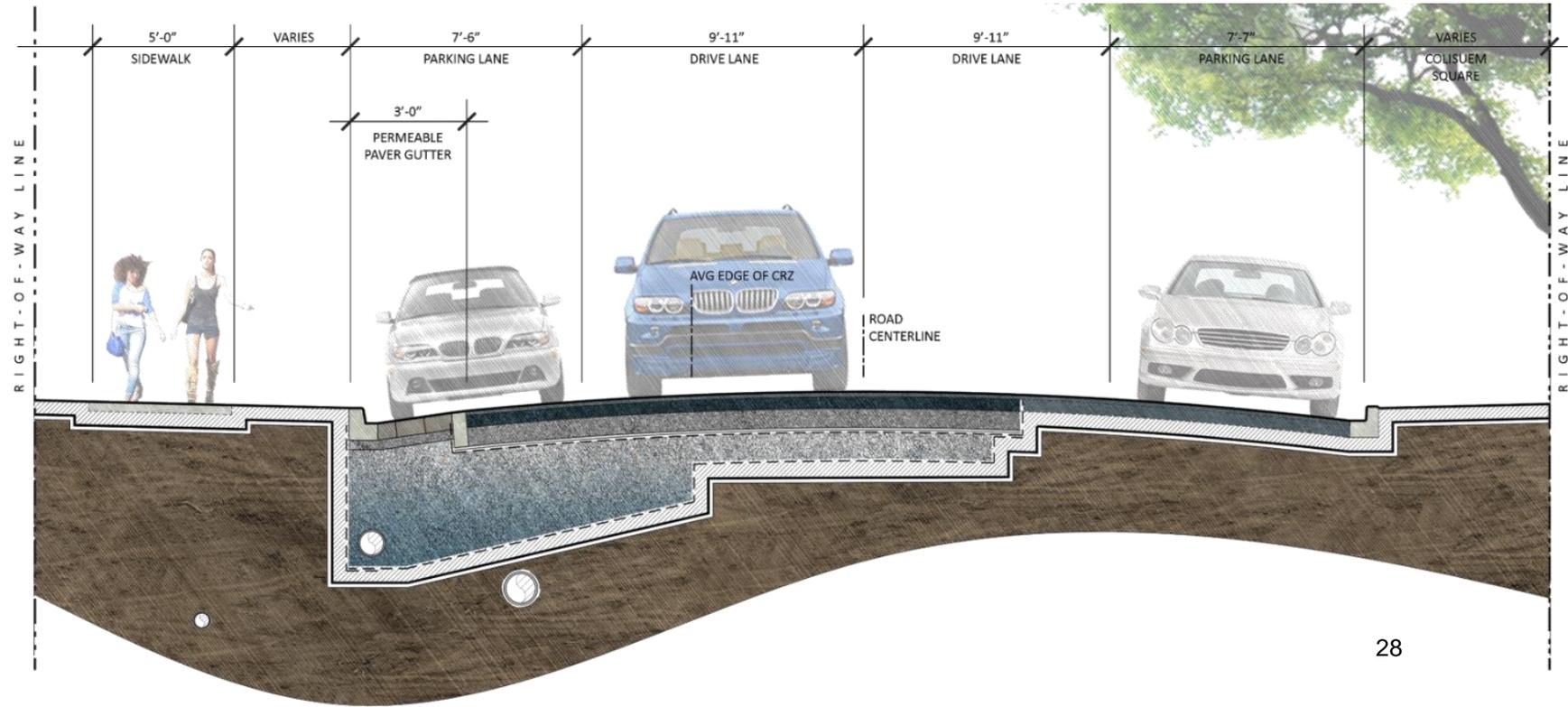
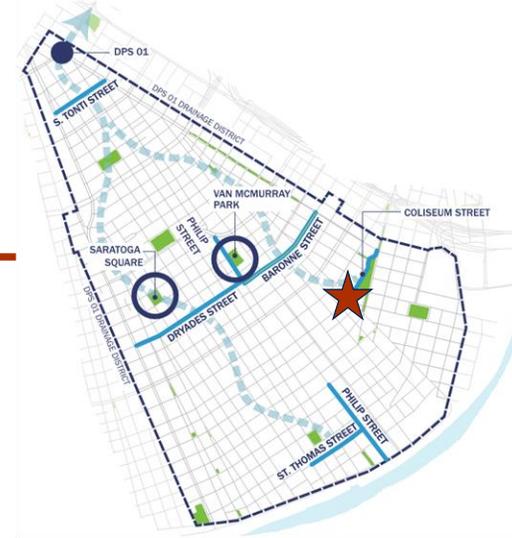
(Upper) Philip Street

- Tchoupitoulas St. to Constance St.
 - Pervious paver gutters / agg storage
- Storage: 120,600 SF
- Length: 2,450 LF
- Cost: \$5,407,000 (\$32.52/CF)



Complete Street: Coliseum Street

- Race St to Melpomene St
 - Pervious paver gutters
 - Subsurface storage aggregate
- Storage: 28,410 CF
- Length: 1,185 LF
- Cost: \$924,000
- Unit Cost: \$32.52/CF



Pipe Upgrades

Pipe Upgrades: Phase I

S. Roman Street

- Toledano to Washington Ave
 - Pipe upgrade to 42" RCPA
- Cost: \$493,400
- Unit Cost: \$777/LF



S. Derbigny Street

- First St to Third St
 - Pipe upgrade to 30" RCP
- Cost: \$671,200
- Unit Cost: \$917/LF



Washington Ave.

- S. Roman St to S. Claiborne Ave.
 - Pipe upgrade to 36" RCPA
- Cost: \$806,200
- Unit Cost: \$1,024/LF



Pipe Upgrades: Phase I

Annunciation Street

- First St to Second St
 - Pipe upgrade to 24" RCP
- Cost: \$369,100
- Unit Cost: \$954/LF



Race Street

- Chippewa to Annunciation
 - Pipe upgrade to 36" RCP
- Cost: \$330,200
- Unit Cost: \$828/LF



Orange Street

- Camp to Tchoupitoulas
 - Pipe upgrade to 36" RCPA
- Cost: \$2,408,500
- Unit Cost: \$946/LF



Pipe Upgrades: Phase II

Chippewa Street

- Washington Ave to First St
 - Pipe upgrade to 24" RCP
- Cost: \$562,000
- Unit Cost: \$586/LF



Dryades Street

- Louisiana Ave to Philip St
 - Pipe upgrade to 36" & 42" RCPAs
- Cost: \$2,031,000
- Unit Cost: \$626/LF



(Lower) Philip Street

- Simon Bolivar Blvd. to Baronne St
 - Pipe upgrade to 36" RCP
- Cost: \$1,120,000
- Unit Cost: \$820/LF



Pipe Upgrades: S. Tonti Street

- Toledano St. to MLK Blvd.
 - Pipe upgrade to 42" Perforated RCP
- Cost: \$1,526,000
- Unit Cost: \$1,003/LF

