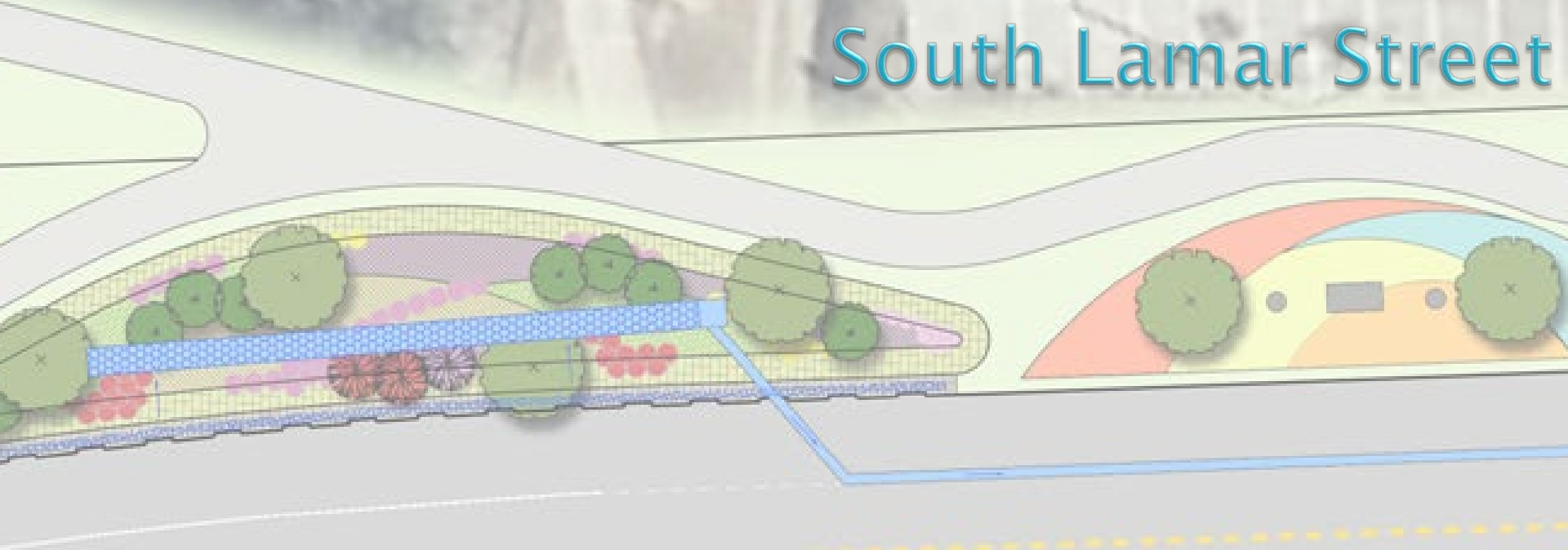


LOW IMPACT DEVELOPMENT DESIGN COMPETITION

South Lamar Street



PUBLIC WORKS ROUNDUP
MAY 23, 2013



DORCY CLARK
CITY OF DALLAS

BEN MCWHORTER
FREESE AND NICHOLS



THE COMPETITION GOALS

Conserves
Resources and
Functions

Minimizes
Impervious
Areas

Reduces the
Storm Water
Infrastructure

Minimizes
Irrigation
Needs

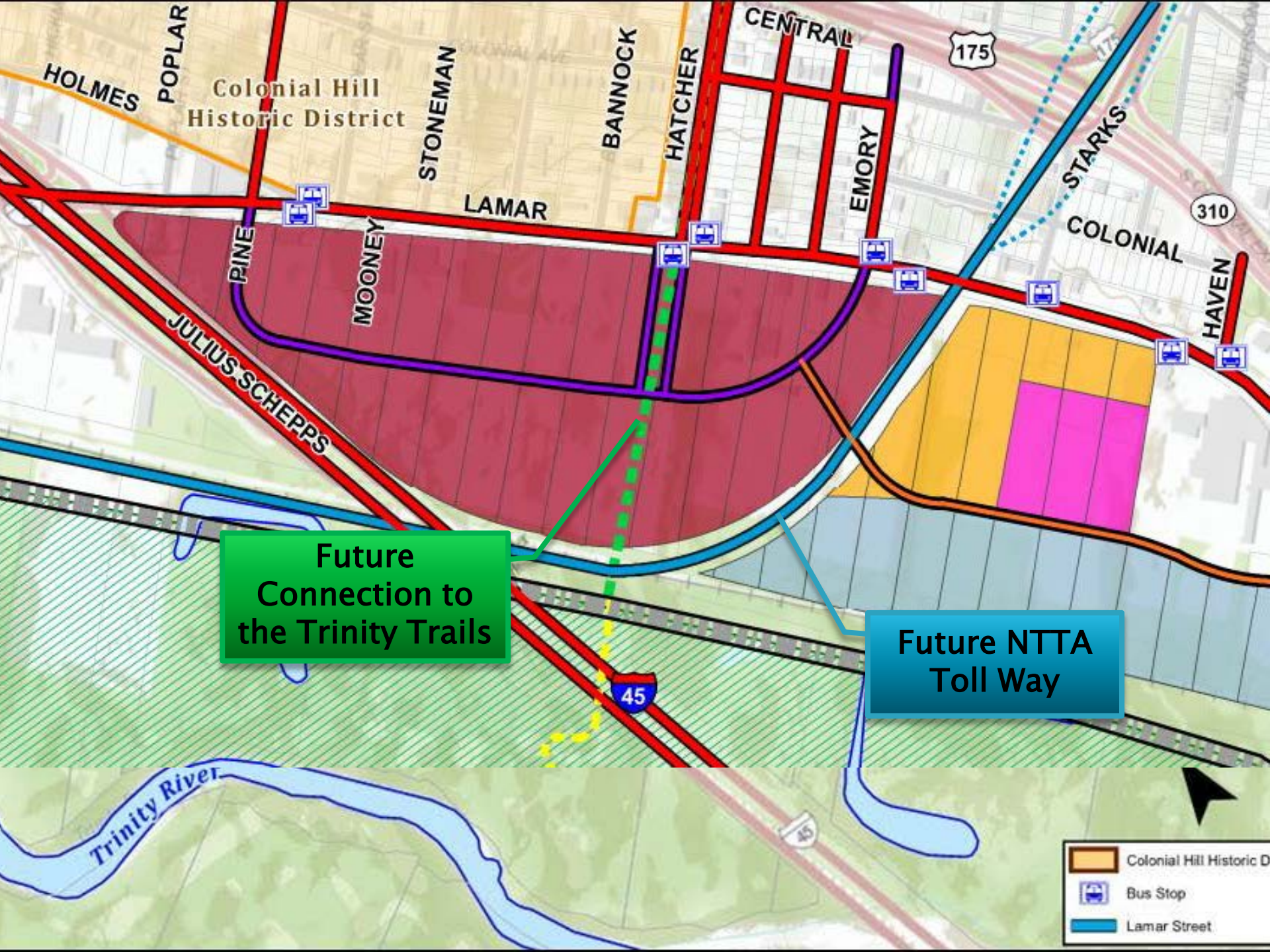
Lowers the
Total Costs

Reduces
Maintenance
Costs

Enhance the
Quality of Life

Improve Storm
Water Quality

Site Specific
Benefits



**Future
Connection to
the Trinity Trails**

**Future NTTA
Toll Way**

- Colonial Hill Historic D
- Bus Stop
- Lamar Street

South Lamar Street

Existing Conditions



Historic Borden Plant

South Lamar Street

Existing Conditions



Local Artwork

South Lamar Street

Existing Conditions



Impervious ROW

South Lamar Street

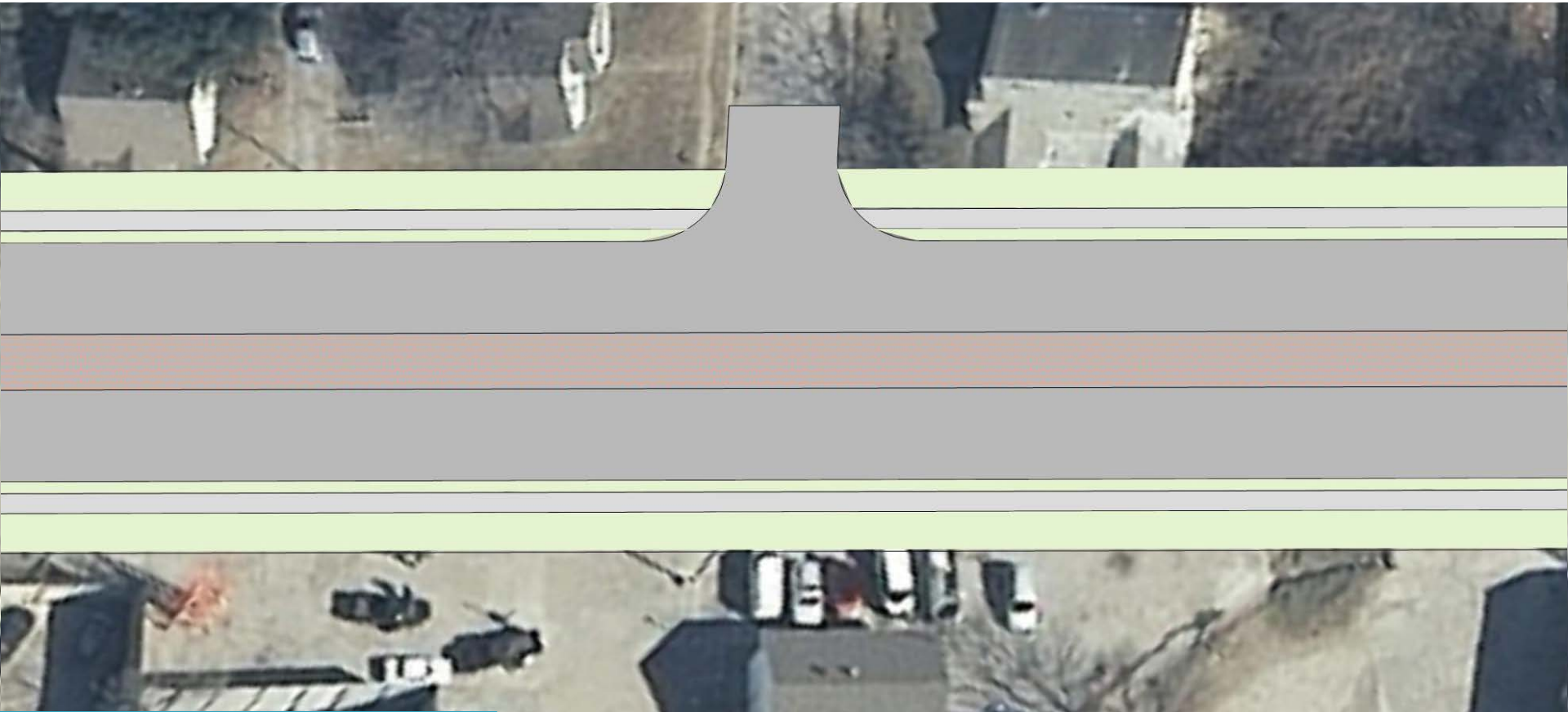
Existing Conditions



Dated Infrastructure

Standard Roadway

Safe and Convenient for
CAR Traffic Only



Wide Divided
Roadway

Split Green
Space

Small Sidewalks
Close to Road

LID Roadway Layout

UNDIVIDED AND OFFSET ROADWAY



**CONSERVE
RESOURCES &
FUNCTION**

**Site Specific
Benefits**

**Green Space
Buffer Zone**

Reduces Costs

Complete Street Design

SAFE, CONVENIENT FOR
ALL MODES OF TRANSPORT



**ENHANCE
THE QUALITY
OF LIFE**

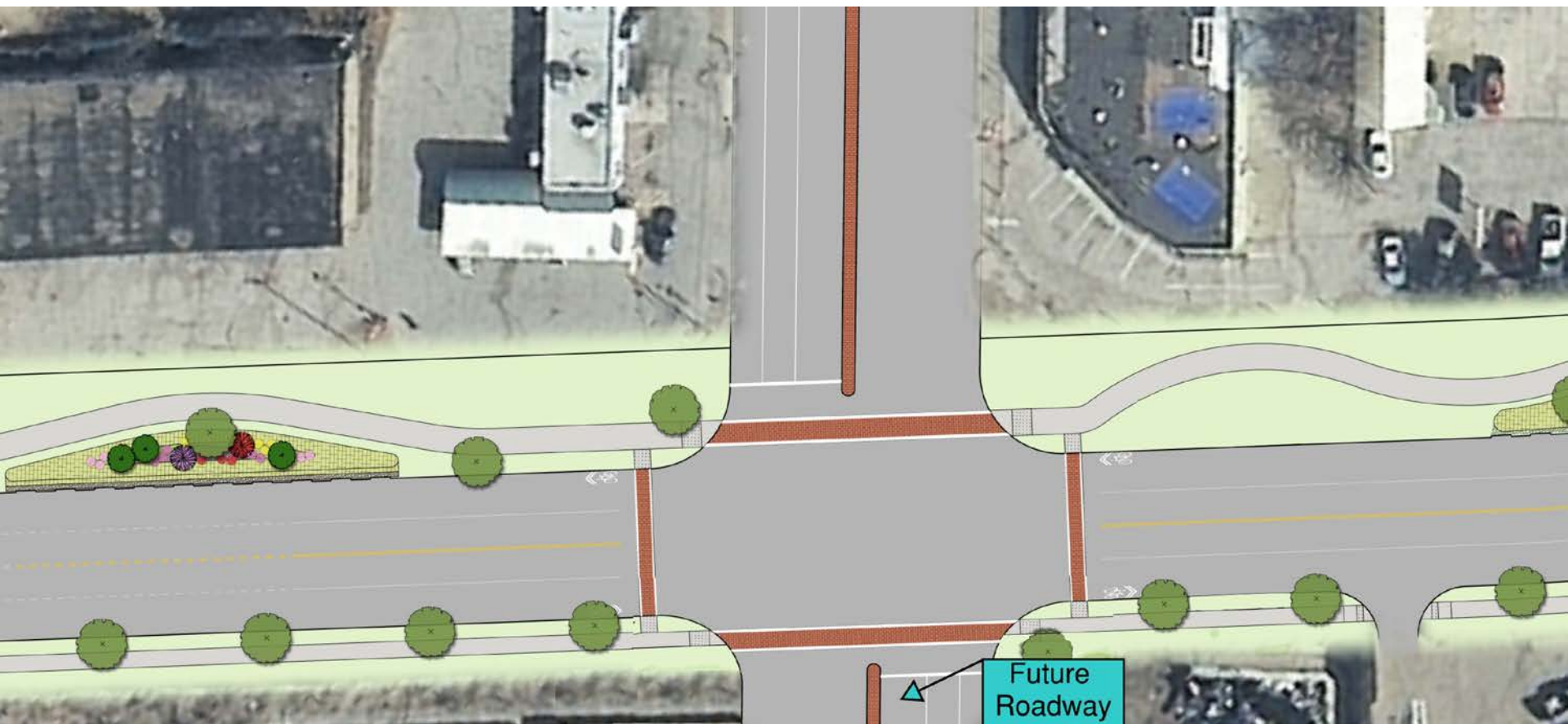
**On-Street
Parking**

**Meandering
Trail**

**Shared Bicycle
Lane**

Intersection Improvements

ALIGNS WITH
FUTURE AREA
PLANNING



**SITE
SPECIFIC
BENEFIT**

**Handicap
Accessible**

**Stained
Crosswalks**

**Decorative
Inlays**

Pedestrian Amenities

Future Pedestrian Access to The Trinity Trails



**ENHANCE
THE QUALITY
OF LIFE**

**Shaded
Benches**

**Decorative
Surface Treatment**

**Pedestal Safety
Lighting**

Pedestrian Amenities

LED Lighting and Historical Kiosks



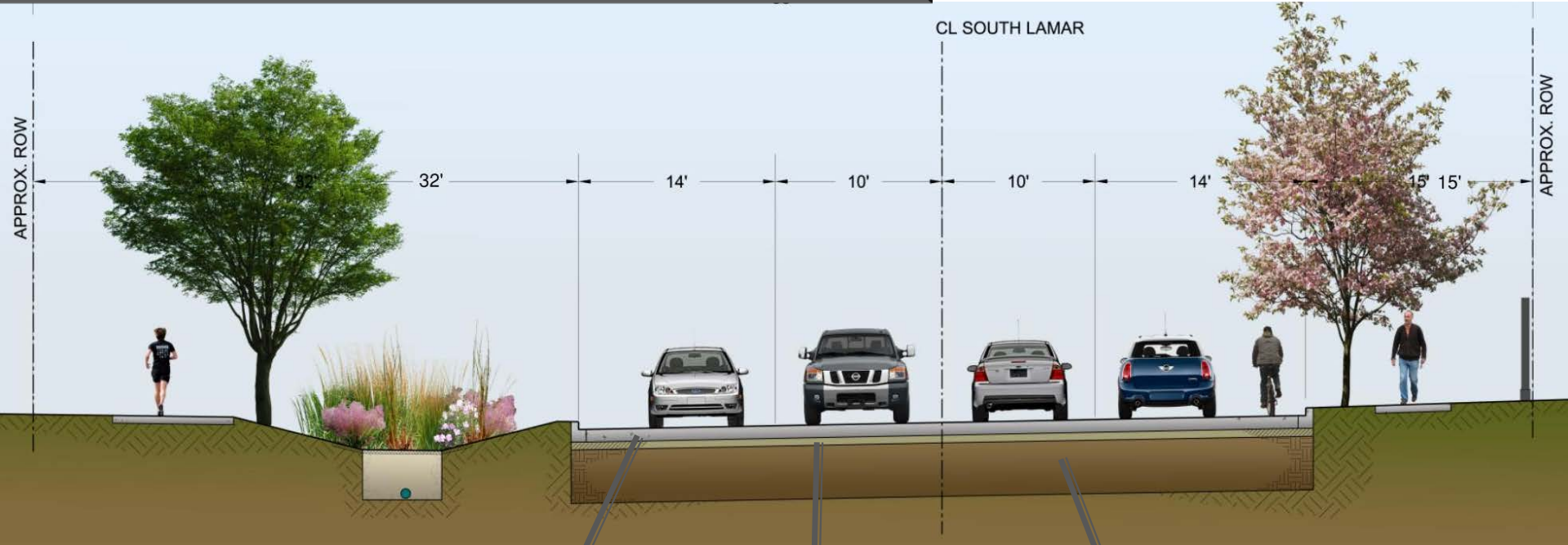
**CONSERVE
RESOURCES &
FUNCTION**

**Reduces
Maintenance
Costs**

**Promotes
Safety**

**Encourage
Neighborhood
Pride**

Sustainable Pavement Design



Recycled Pavement & Road Base

Re-Used Asphalt Bonding Layer

Moisture Treated Subgrade

**CONSERVE
RESOURCES &
FUNCTION**

Reduces
Maintenance
Costs

Extends
Pavement Life

Reduces Life
Cycle Costs

LID DRAINAGE CONCEPT

MINIMIZE THE
QUANTITY
OF RUNOFF



MAXIMIZE THE
QUALITY
OF RUNOFF



Overview of Watershed

Watershed Area = 185.3 ac

- ▶ Watershed drains approximately 185 acres
- ▶ Watershed includes existing storm drain systems
- ▶ Existing system outfalls are southwest of Lamar Street

South Lamar Watershed Map

- Existing SW Line
- ▭ Drainage Area
- ▬ Project Extents



Lamar Street Drainage

**Right-of-Way
Drainage = 13.6 ac**

- ▶ Redeveloped right-of-way drains approximately 13.6 acres
- ▶ Drainage on Lamar Street comprises only 7.4% of entire watershed
- ▶ 5 Sub-basins delineated within ROW to drain to determined design points

South Lamar Right-of-Way Drainage

- Existing SW Line
- ▭ Drainage Area
- Design Point



LID Drainage Concept

MINIMIZE THE QUANTITY OF RUNOFF



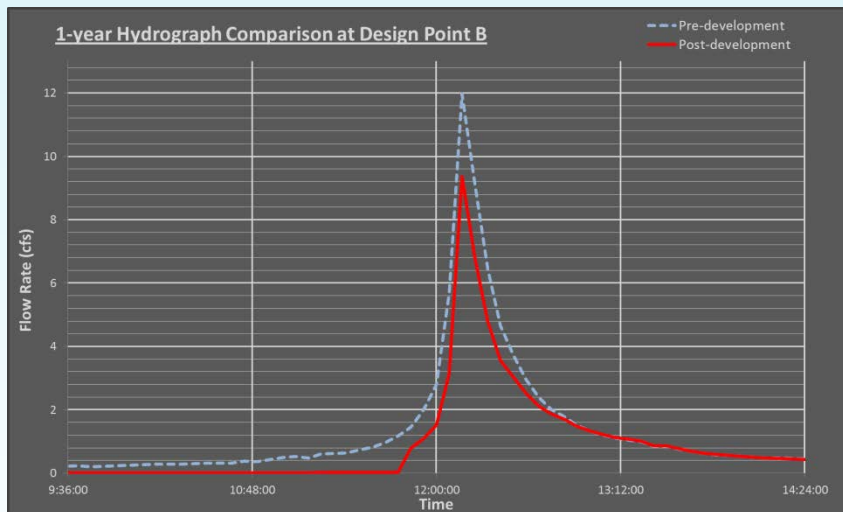
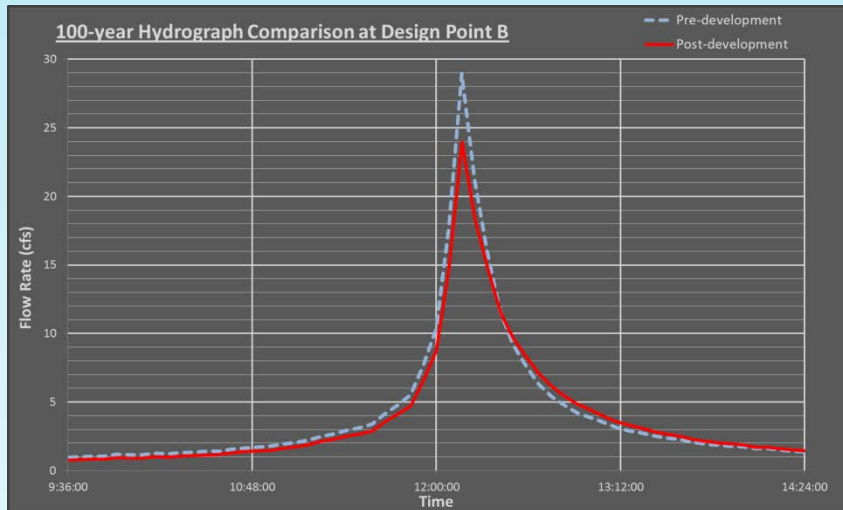
**REDUCE
IMPERVIOUS
AREA**

**Eliminate
median**

Offset Road

**De-centralize
drainage**

Hydrologic Analysis



EPA-SWMM 5.0.022 used to develop hydrologic model of Lamar Street.

- Soil Curve numbers developed based on hydrologic soil group and land use of open space fair
- Change in hydrologic conditions between existing and proposed dependent on:
 - Change in impervious cover
 - Subcatchment routing using LID components in EPA-SWMM

Peak Flow Rate Comparison at Design Point B			
Storm Event	Pre-dev. Peak Flow (cfs)	Post-dev. Peak Flow (cfs)	% Decrease in Peak Flow
1- year	11.97	9.37	22%
25-year	22.56	18.41	18%
100-year	28.97	23.99	17%

Decreased peak flow rate at Design Point B at least 17% from existing conditions

iSWM Requirements

1. Use iSWM *integrated* Site Design Practices to the greatest extent practical to:

➤ Preserve environmentally sensitive areas and riparian buffers



None located on site

➤ Reduce imperviousness



Reduced road width - increased green space

➤ Maintain infiltrative capacity of soils



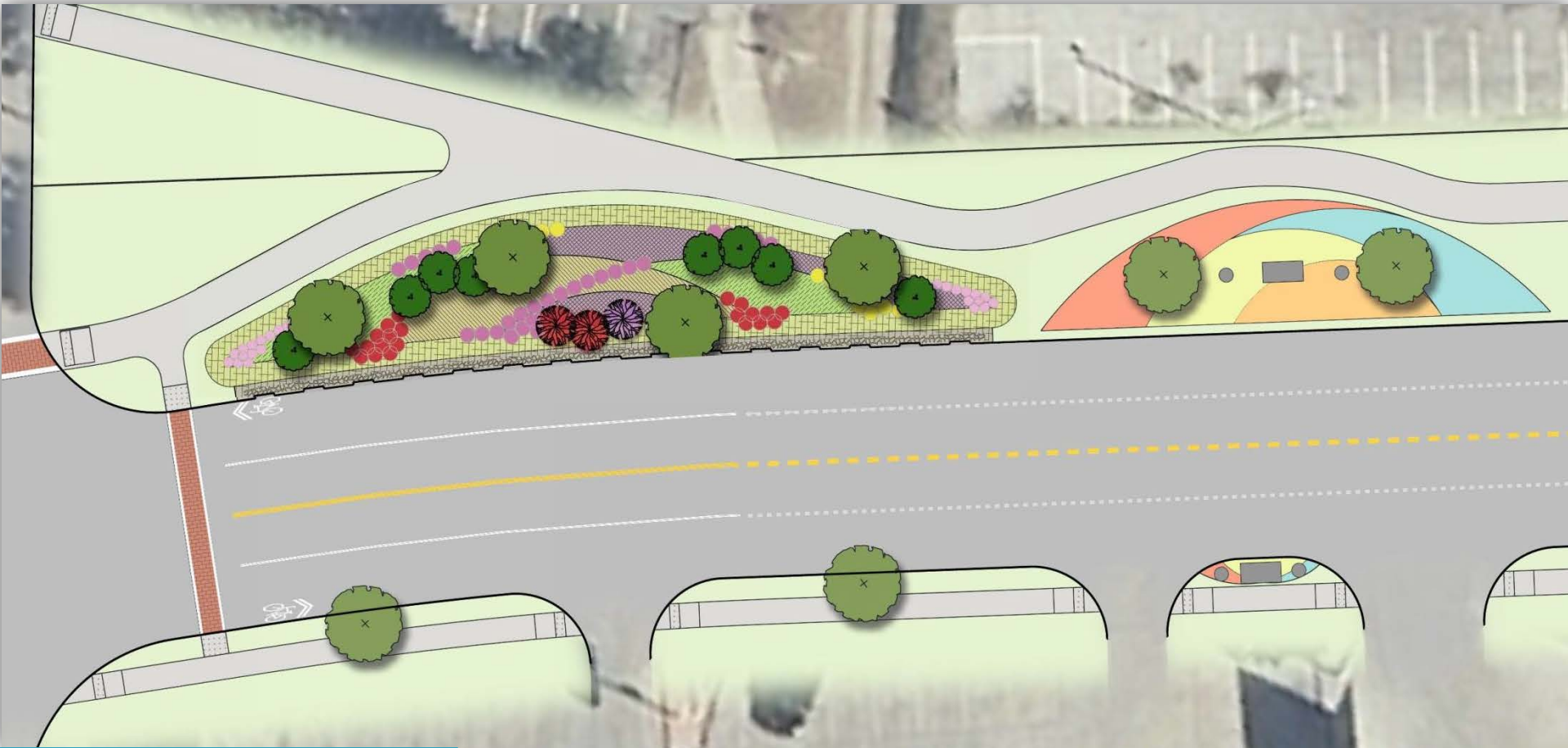
Site is located on D soils (low infiltration rate)

iSWM Requirements

2. Use [iSWM Stormwater Controls](#) to provide at least 80% TSS removal for the first 1.5” of stormwater runoff volume
 - Bioretention cells used to treat stormwater runoff
 - Removes 80% TSS
 - Also removes other pollutants such as nitrogen, phosphorus, and metals

Bioretention Basins

MAXIMIZE THE
QUALITY OF RUNOFF



IMPROVE
STORM WATER
QUALITY

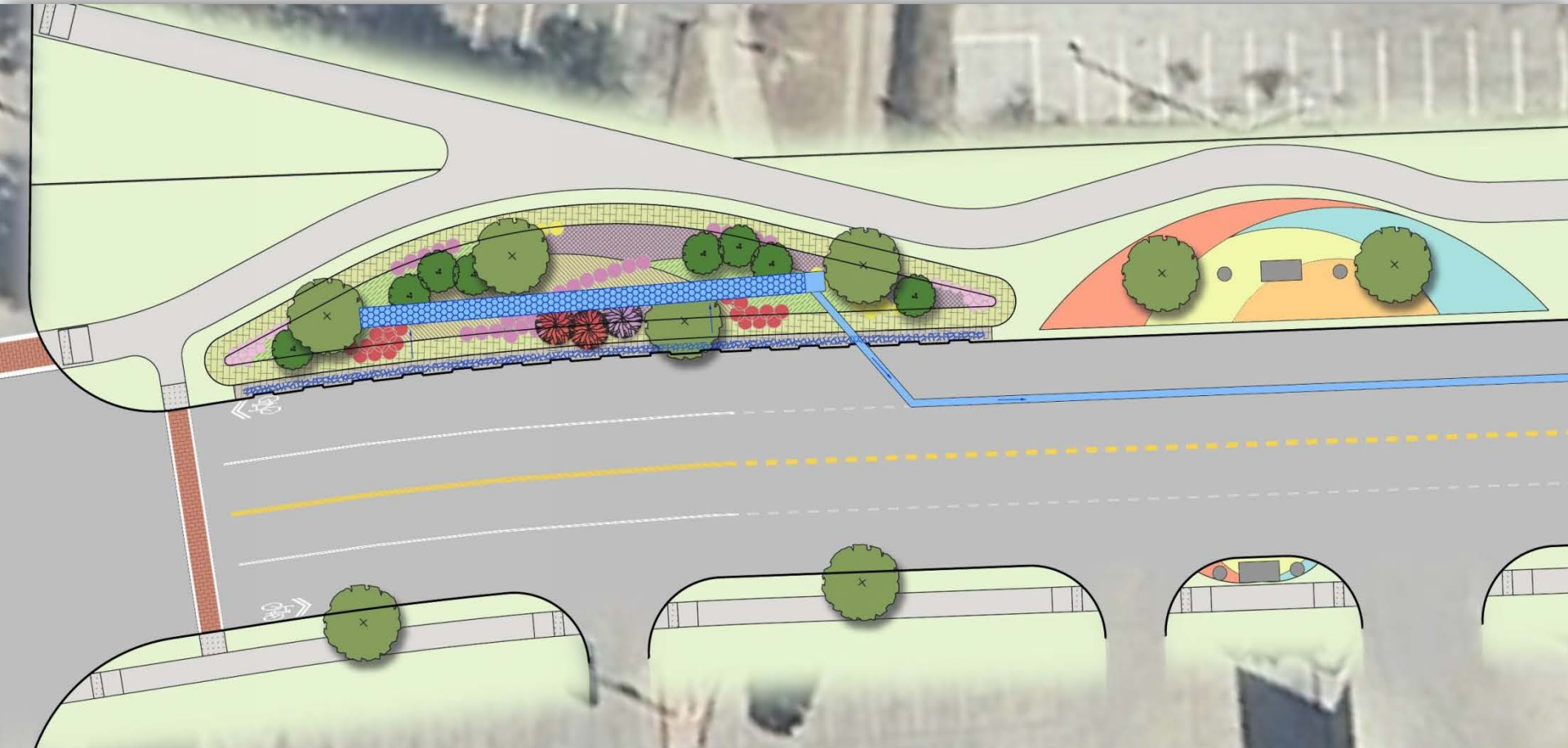
Pollutant
Removal

Vegetated
Depression

Filters Water
Before
Collected

Storm Drain System

MAXIMIZE THE
QUALITY OF RUNOFF



**REDUCE STORM
WATER
INFRASTRUCTURE**

**Detain
Treated Flow**

**Reduced Inlet
Quantity**

**Reduced Pipe
Size**

LID Plantings



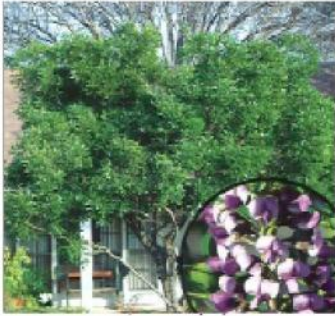
Live Oak



Shumard Oak



Eastern Redbud



Texas Mountain Laurel



Possum Haw



Fall Obedient Plant



Pink Evening Primrose



Scarlet Sage



Plains Coreopsis



Bushy Bluestem



Purple Lovegrass



Cherokee Sage



Buffalo Grass

**MINIMIZES
IRRIGATION
NEEDS**

**Drought
Tolerant Species**

**Promotes
Safety**

Aesthetic Appeal

LIFE CYCLE COST COMPARISON

FACTORS

- ▶ INITIAL COST (8% SAVINGS)
- ▶ ANNUAL PAVEMENT REPAIR COSTS
- ▶ LANDSCAPING MAINTENANCE
- ▶ LIGHTING MAINTENANCE
- ▶ DESIGN LIFE

RESULTS

STANDARD DESIGN

Cost per year=\$323,180

LOW IMPACT DESIGN

Cost Per Year=\$267,716

LOW IMPACT DESIGN SAVES 17% PER YEAR

This estimate does not include water and electricity savings

ISI Envision Rating

- ▶ The Envision™ Rating System evaluates, grades, and gives recognition to infrastructure projects that use transformational, collaborative approaches to assess the sustainability indicators over the course of the project's life cycle.

CATEGORY SECTION	MAXIMUM POSSIBLE SCORE	SECTION POINTS
QUALITY OF LIFE	181	125
LEADERSHIP	106	51
RESOURCE ALLOCATION	182	120
NATURAL WORLD	188	89
CLIMATE AND RISK	122	76
	779	461

Project Rated by a credentialed ENV PV

South Lamar Street Earns ISI **Platinum** Award!



BEFORE
CONCRETE EXPANSE

AFTER

URBAN RESTORATION



City of Dallas

