

Laying the Foundations of School Ground Redesign

John Tangenberg



COUNCIL FOR
WATERSHED HEALTH

LAUSD Tree Canopy Study

Measure the tree canopy and the permeability to rainwater of the Los Angeles Unified School District elementary schools to inform prioritization for tree planting efforts and green infrastructure.



Why Schools?

82%

Built out or paved.

(Los Angeles County Hydrology Manual)



Why Schools?

No Existing Measure of Tree Canopy

On School Grounds in Los Angeles





Why Schools?

School Districts are

Large Land Owners

in Urban Southern California.



Why Schools?

Elementary Schools have a

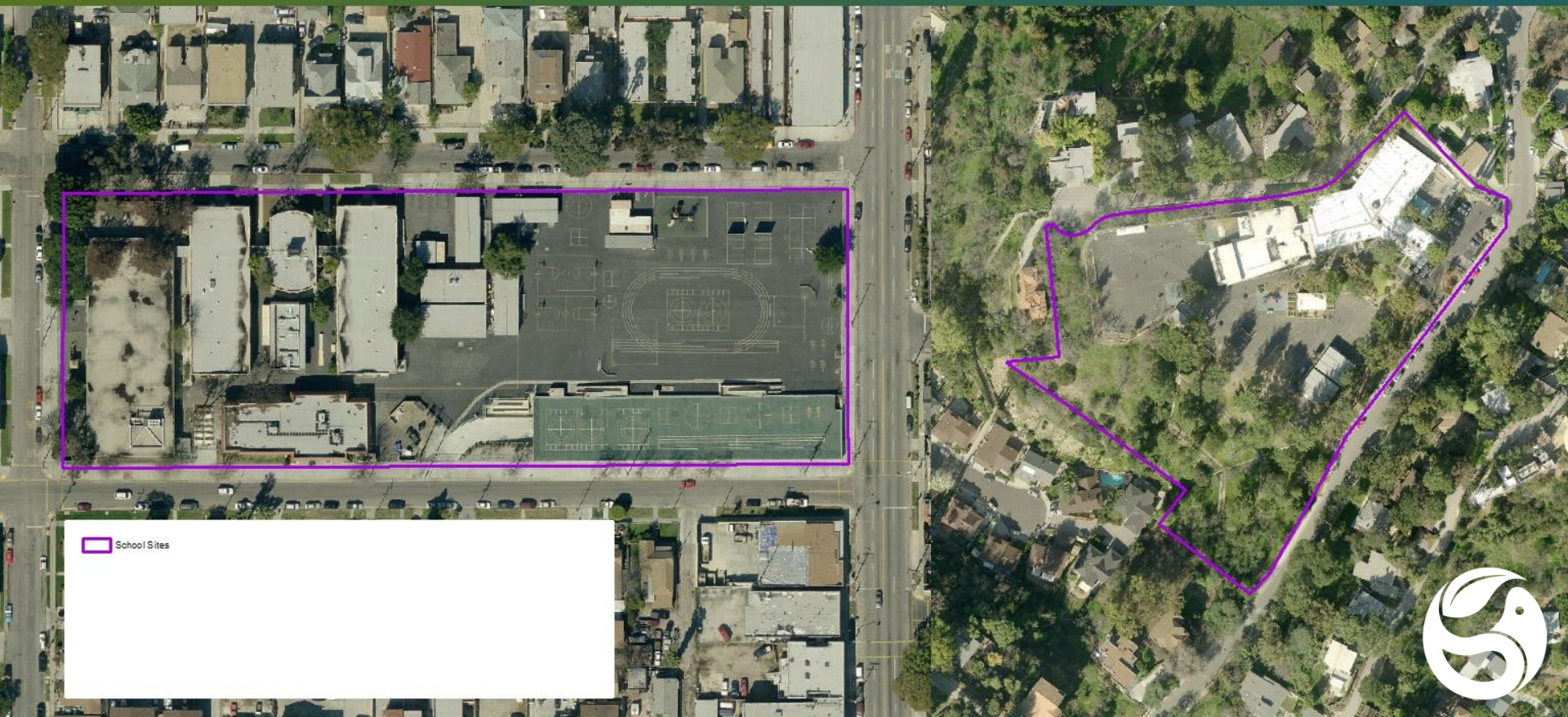
High Potential for

Consuming Benefits

from green infrastructure



Building the Data



■ School Sites



Canopy



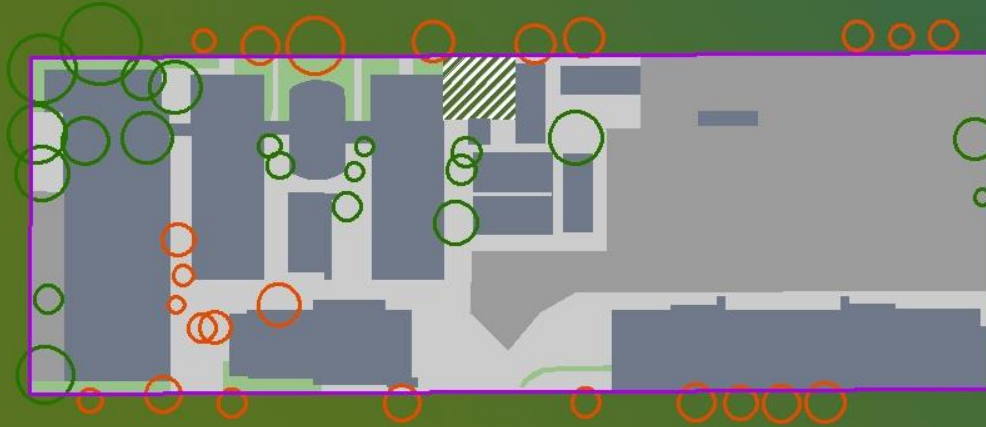
Non – Play Surfaces (Impervious)



Non – Play Surfaces (Pervious)



Play Surfaces (Pervious and Impervious)



- | | |
|---|--|
| School Sites | Building RoofLine |
| Deciduous | Parking Lot |
| Evergreens including oaks and eucalypts | Pavement-Walkway; other |
| Palm trees | Inaccessible pervious landscaped groundcover |
| | Non student accessible pervious open space, hill slope, park |
| | Impervious play and student accessible area |
| | Pervious play and student accessible area |
| | School Garden |



1st St. Elementary School

Est. 1890

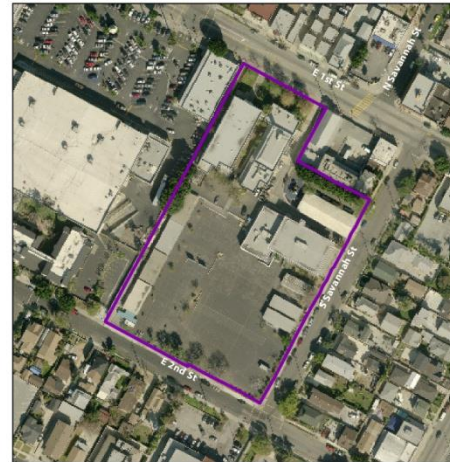
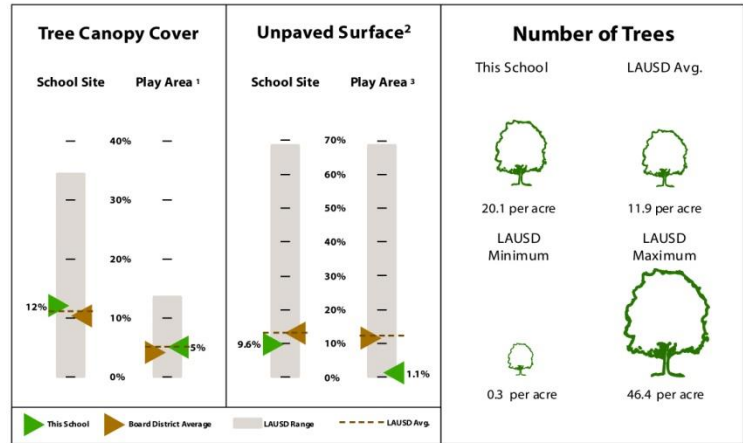


- School site
- Canopy Cover**
- Deciduous
- Evergreen
- Palm Tree

Surface Types

- Building roof line
- Accessible paved play area
- Accessible unpaved play area
- Inaccessible landscape
- Inaccessible open space/hill/slope/parks
- Parking lot
- Walkways and other pavement
- School garden

The canopy and surface cover derived by Council for Watershed Health from visual analysis of 2011 LARIAC 1 ft imagery, LA County GIS Building roofline, CAMS Street data and school site data provided by LAUSD.



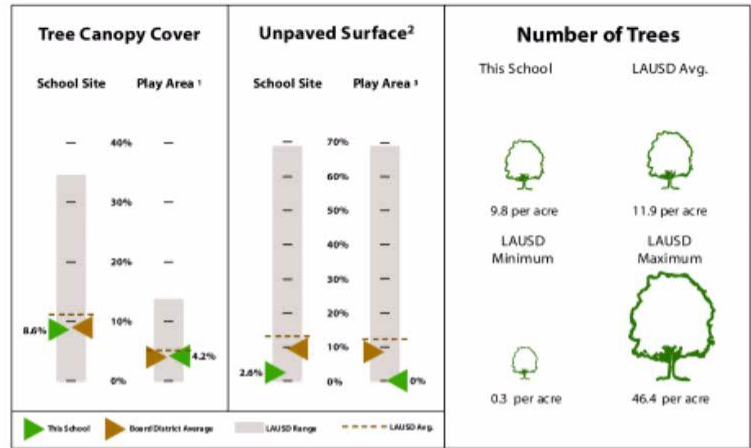
¹ Includes Accessible paved play area, Accessible unpaved play area and School gardens.
² Includes Inaccessible landscape, Inaccessible open space/hill/slope/parks, Accessible unpaved play area and School gardens.
³ Includes Accessible unpaved play area and School gardens.

32nd/USC Performing Arts Magnet

Est. 1941

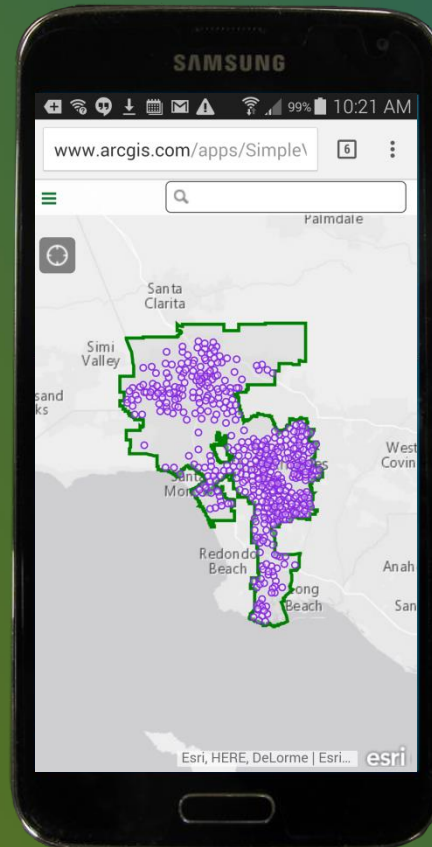


Tree canopy and surface cover derived by Council for Watershed Health from visual analysis of 2011 LIDAR, 1:1 scale maps, LA County GIS Building rooftop, CAMS Street data and school site data provided by LAUSD.

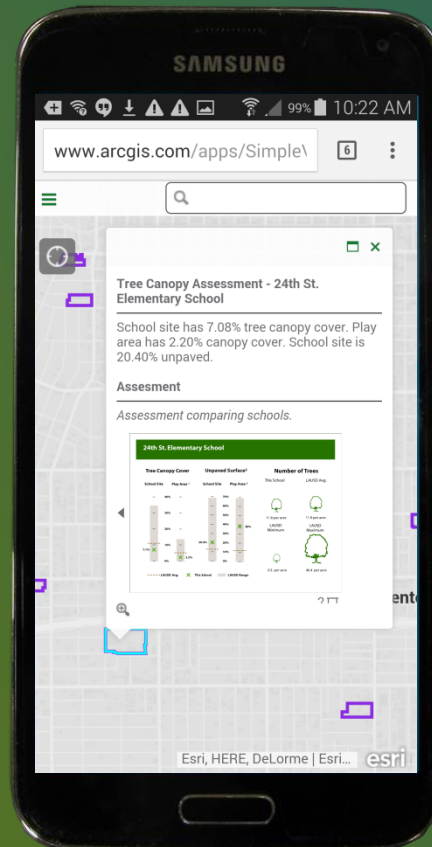


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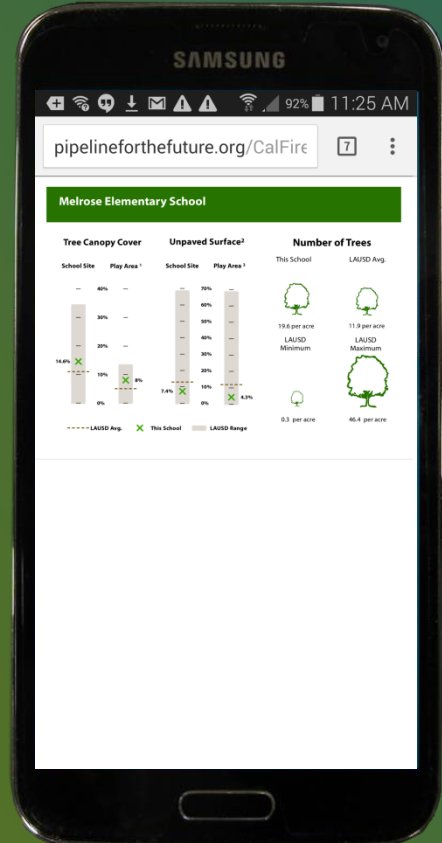
Information Access Via Mobile



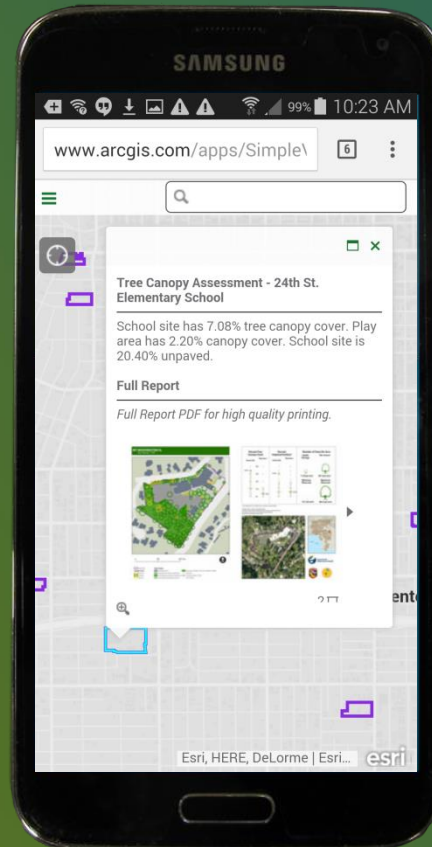
Information Access Via Mobile



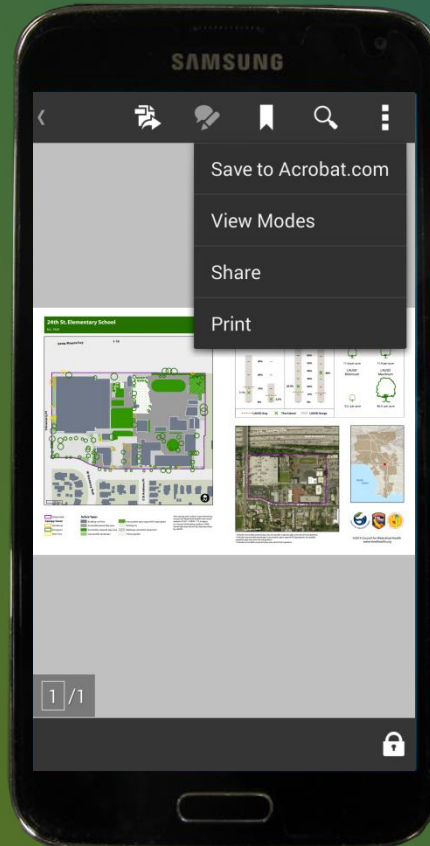
Information Access Via Mobile



Information Access Via Mobile



Information Access Via Mobile



DROPS the 30% Redesign

Drought Response Outreach Program for Schools
(DROPS)

Providing Technical Assistance via
ArcGIS online and Web App Builder maps.



Web Map And Web App Data Input

The screenshot displays the DROPS Data Viewer interface. At the top left, the logo and text "DROPS Data Viewer" and "Council for Watershed Health" are visible. A search bar contains "Esri World Geocoder". On the right, a "Layer List" panel is partially open. The main map area shows an aerial view of a facility with several numbered polygons: red outlines (1-6, 7, 10, 14, 16) and green outlines (1-6, 7, 11, 12, 13, 15, 16). Red and yellow circular markers are placed on the map. A scale bar at the bottom left indicates 100ft. The bottom right corner features logos for DigitalGlobe, Microsoft, and Esri.

Web Map And Web App Data Input

The screenshot displays the DROPS Data Viewer interface. At the top, the title bar reads "DROPS Data Viewer" and "Council for Watershed Health". A search bar on the left contains "Esri World Geocoder". The main map area shows an aerial view of a residential and commercial area with various colored overlays: red outlines for property boundaries, green outlines for specific areas, and a blue/purple line representing a water feature or drainage path. A popup window is open over a yellow dot on the map, displaying the following information:

(1 of 3) Info_pt: Other
Type: Other
Notes: LID #12: Add gutters, downspouts, first flush diverters, and cisterns to intercept roof runoff, overflow to bioretention.
[Zoom to](#)

At the bottom right, there is a logo for "DigitalGlobe Microsoft esri".

Web Map And Web App Data Input

The screenshot displays the DROPS Data Viewer interface. At the top left, the title "DROPS Data Viewer" and the organization "Council for Watershed Health" are visible. A search bar labeled "Esri World Geocoder" is present. The main area is an aerial map showing a road network and a highlighted contributing area in blue. A popup window titled "InfoPoly: ContributingArea" is open, displaying the following information:

InfoPoly: ContributingArea	
Type	ContributingArea
LID No.	9
AREA	14,145.5 Sq Feet
Notes	access road runoff directed to bioretention and existing native landscape.


Below the notes, there is a "Zoom to" link. The map also shows other features like red circles and green outlines, and a scale bar indicating 100 feet. The Esri logo and "DigitalGlobe, Microsoft" are visible in the bottom right corner.

Web Map And Web App Data Input

The screenshot displays the DROPS Data Viewer interface. At the top, the title bar reads "DROPS Data Viewer" and "Council for Watershed Health". A search bar contains "Esri World Geocoder". The main map area shows an aerial view of a landscape with several numbered polygons (3, 5, 5, 7, 13, 14, 15, 16, 16, 17, 80) and red circular markers. A popup window for feature 14 is open, showing the following details:

Name	
Description	
Icon color	r
Picture URL	More info
Thumbnail URL	More info
Is Video	false

Image 1



[Zoom to](#)

At the bottom right, there is a logo for "DigitalGlobe Microsoft esri".

Web Map And Web App Data Input

The screenshot displays the DROPS Data Viewer interface. At the top, the title bar reads "DROPS Data Viewer" and "Council for Watershed Health". A search bar contains "Esri World Geocoder". The main view is an aerial photograph with a detailed landscape design plan overlaid. The plan features a winding path, a central building, a pond, and various plantings, all marked with numbered red and yellow circles. A scale bar in the bottom left corner indicates 100 feet. The bottom right corner features the Esri logo and the text "DigitalGlobe, Microsoft".

Next Steps

Integrate additional hydrology priorities into reporting.

Integrate educational opportunities with technology and STEM.



Current research into tree canopy ecosystem benefits related to sun safety - Moreno and Hilton at CGU.



Having Students Explore Water on Campus

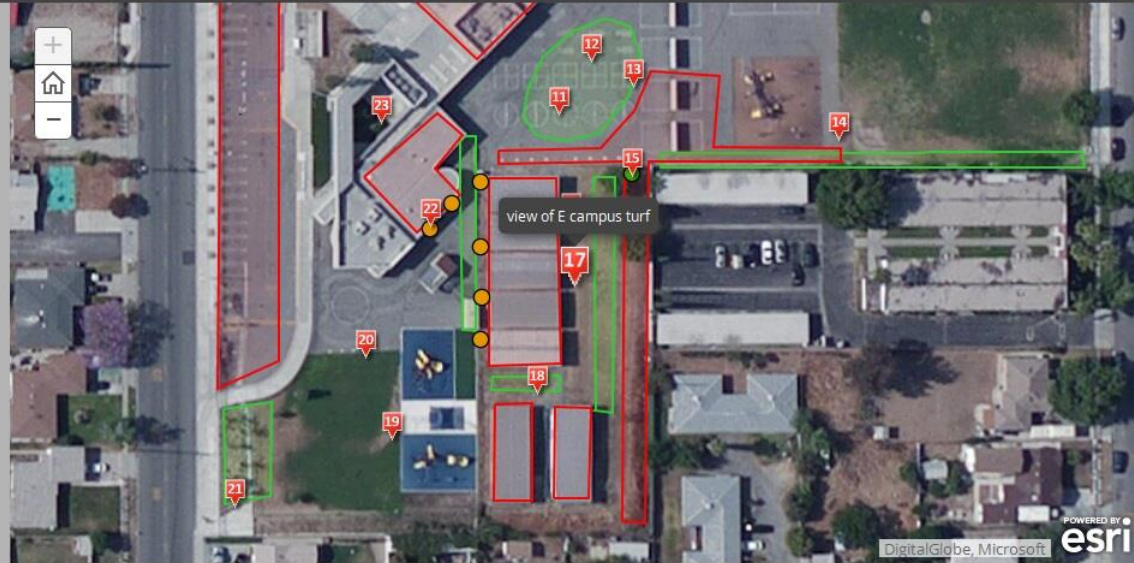
Date Elementary School, Fontana


Where Water Flows at Date elementary

A story map   



view of E campus turf



POWERED BY
DigitalGlobe, Microsoft 



view N: play yard



view N: asphalt play yard



view N: asphalt play yard



S campus: V Channel/Drain



E Campus: perimeter slope



portable downspouts



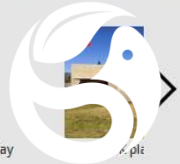
view of E campus turf



view W from portables



S campus view N - play yards



Measures of Hydrology and Other Benefits

75TH - BROADWAY Alley #2

Alley Redesign Considerations

Runoff Volume by Land Use: (Avg annual)

Residential property	11270 cuft
Commercial property	37150 cuft
Industrial property	0 cuft
Total runoff	48420 cuft

3/4" Design Storm Capture: (Avg annual)

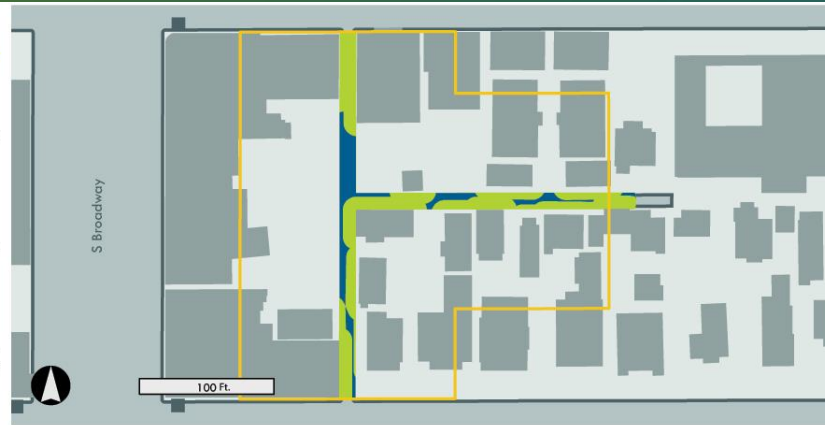
Impervious runoff	33340 cuft
Pervious runoff	645 cuft

Soils Information:

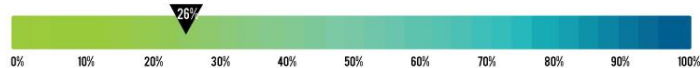
Soil name	Hanford Fine Sandy Loam
KSAT rate	0.79 in/hr
Field capacity	2.45 in/ft

Dimensions

Alley	5769 sqft
Estimated Catchment	61940 sqft



PERCENT OF ALLEY AREA AVAILABLE FOR INFILTRATION



Ideal for Flow Through BMPs

- Example 1
- Example 2
- Example 3

Ideal for Infiltration BMPs

- Example 1
- Example 2
- Example 3

ADDITIONAL BENEFITS



Measures of Hydrology and Other Benefits

75TH - BROADWAY Alley #12

Alley Redesign Considerations

Runoff Volume by Land Use: (Avg annual)

Residential property	0 cuft
Commercial property	38400 cuft
Industrial property	0 cuft
Total runoff	38400 cuft

3/4" Design Storm Capture: (Avg annual)

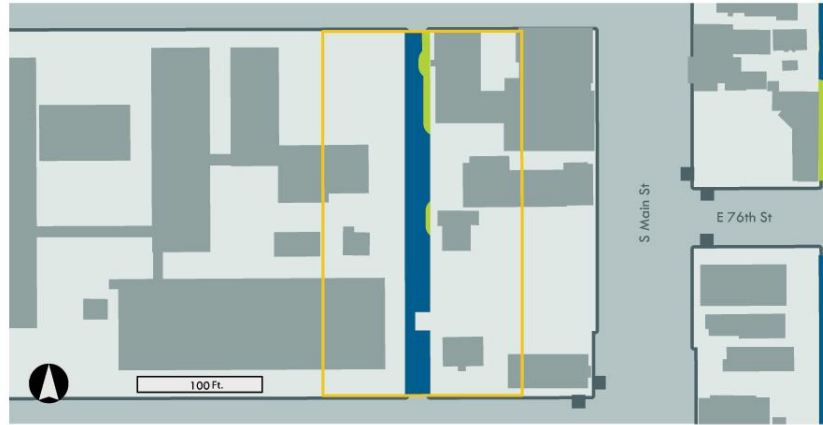
Impervious runoff	26527 cuft
Pervious runoff	411 cuft

Soils Information:

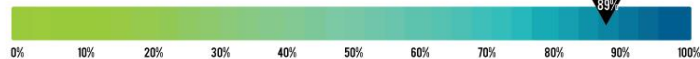
Soil name	Hanford Fine Sandy Loam
KSAT rate	0.79 in/hr
Field capacity	2.45 in/ft

Dimensions

Alley	5677 sqft
Estimated Catchment	46771 sqft



PERCENT OF ALLEY AREA AVAILABLE FOR INFILTRATION



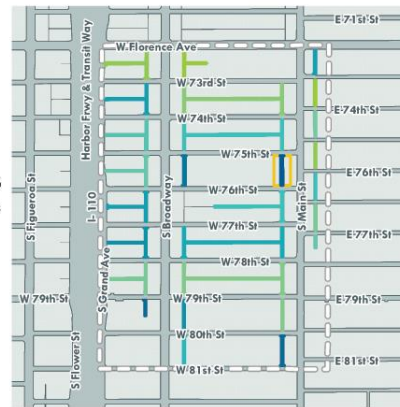
Ideal for Flow Through BMPs

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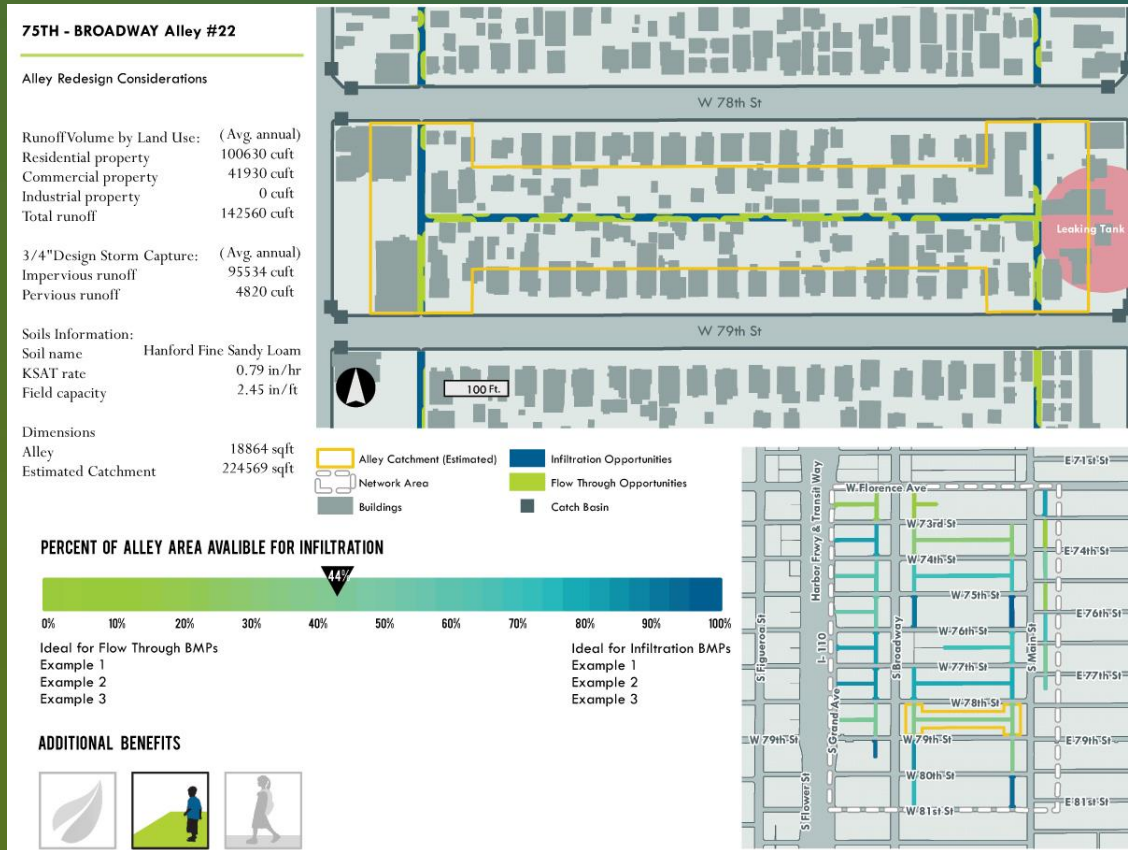
Ideal for Infiltration BMPs

- Example 1
- Example 2
- Example 3

ADDITIONAL BENEFITS



Measures of Hydrology and Other Benefits



Thank You

Contact: john@watershedhealth.org

Project Funding:

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