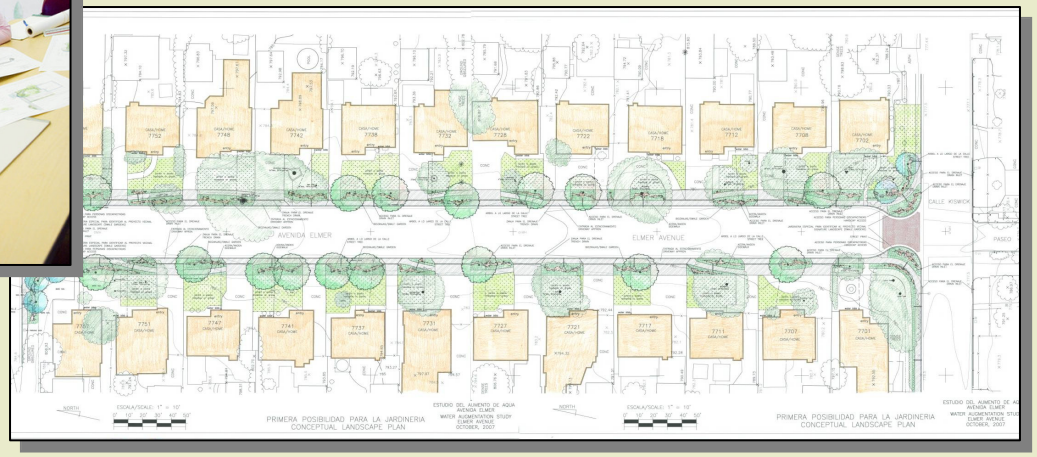
The Los Angeles & San Gabriel Rivers Watershed Council

Rethinking Stormwater Management One Block at a Time:

The Elmer Avenue Neighborhood Retrofit Project



CA NPS Conference 2008

Edward Belden, *Los Angeles & San Gabriel Rivers Watershed Council*
Melinda Kelley, *Consultant*

LA Basin Water Augmentation Study (2000-2010)

Managing stormwater as an asset

Purpose of the study: to explore the practical potential for increasing local water supplies and protecting receiving waters by capturing stormwater runoff for infiltration and groundwater recharge

Research questions:

– Impact on groundwater quality and quantity
– Accessibility of recharged water
– Cost effectiveness
– Other potential benefits: social, economic and environmental
– Potential for region-wide implementation

WAS Research Design

✓**Initial Study (2000-01)**

– Literature Review

– Preparation of Monitoring Plan

✓**Phase I Pilot Study (2001-02)**

– Investigation of the groundwater quality impacts of infiltrating storm water by monitoring two BMP sites

✓**Phase II (2002-07)**

– Additional sites, different land uses and site conditions, continued monitoring program

→**Phase III (2003-2010)**

– Residential neighborhood demonstration project (retrofit)

– Regional runoff-infiltration model and economic models

– Assess feasibility of region-wide infiltration in terms of physical constraints, social and institutional issues and economic factors

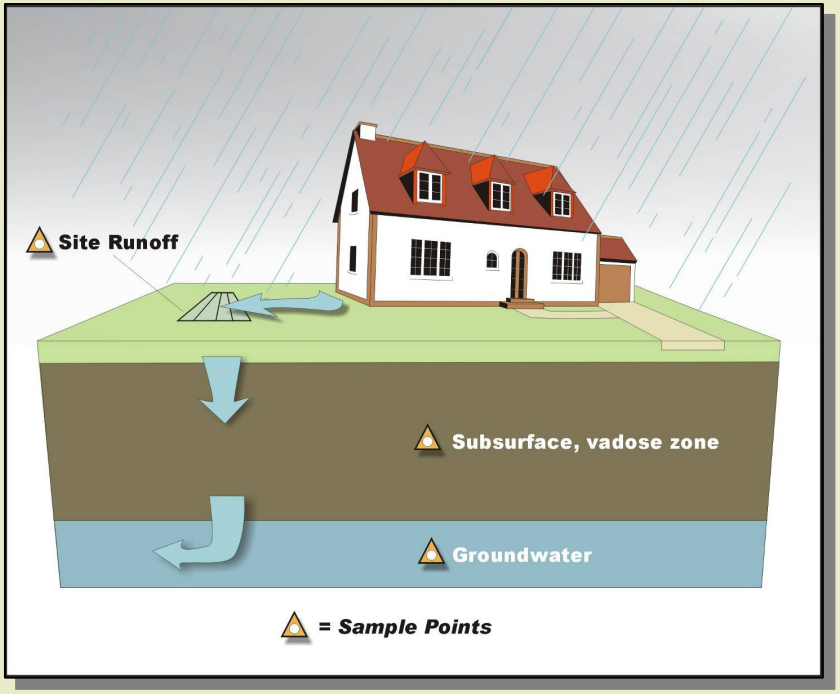
Note: *Monitoring Report, Concept Plan and Outreach Plan available at our website: www.lasgrwc.org*

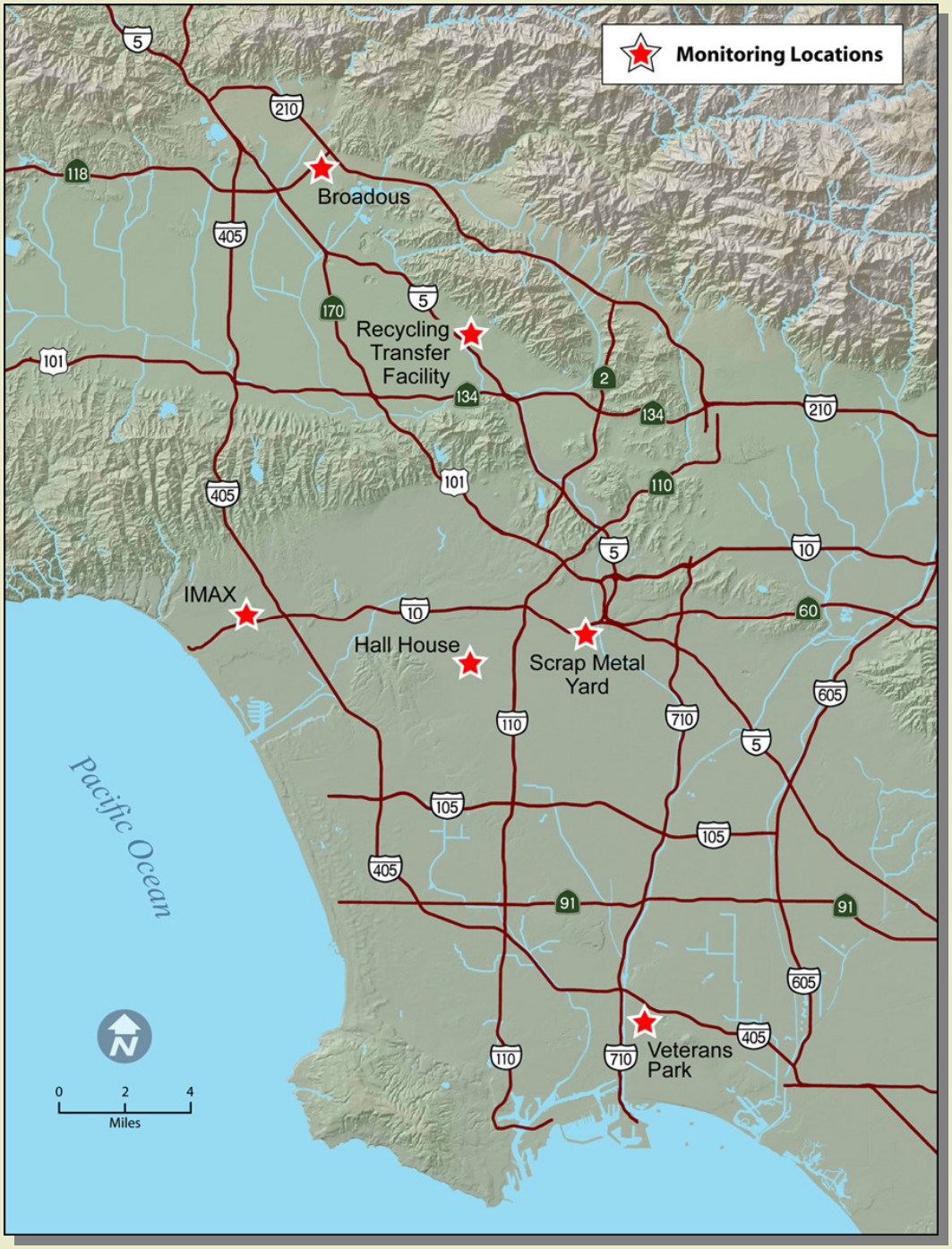
WAS Funding partners

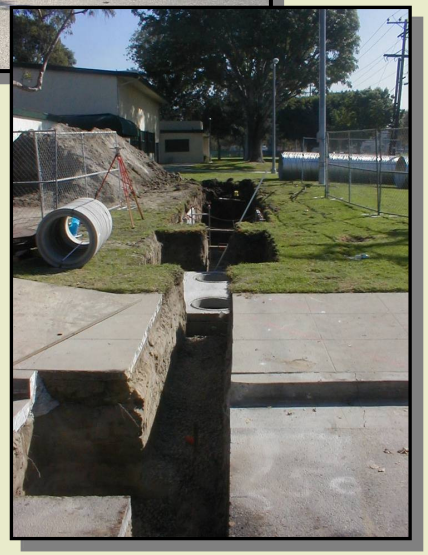
City of Los Angeles Department of Water & Power
City of Los Angeles Watershed Protection Division
City of Santa Monica Environmental Programs
County of Los Angeles Department of Public Works
Department of Water Resources
Metropolitan Water District of Southern California
Regional Water Quality Control Board, LA Region
TreePeople
University of California, Riverside
U. S. Bureau of Reclamation
Water Replenishment District of Southern California

Monitoring Program

- Constituent list included pollutants of concern for stormwater and groundwater
- Sampling plan: 3-4 storm events/season for 2-4 years
  - Sample site runoff during storm
  - Sample lysimeters and wells after storm
  - Monitor infiltration rates
- Continued subsurface monitoring (2 storm events/yr for 2 years)







- ***Broadous Elementary School***, *Pacoima*
- ***IMAX Office Bldg***, *Santa Monica*
- ***Hall House***, *South LA*
- ***Metal Recycler***, *Los Angeles*
- ***Veterans Park***, *Long Beach*
- ***Recycling Facility***, *Sun Valley*

Monitoring Sites

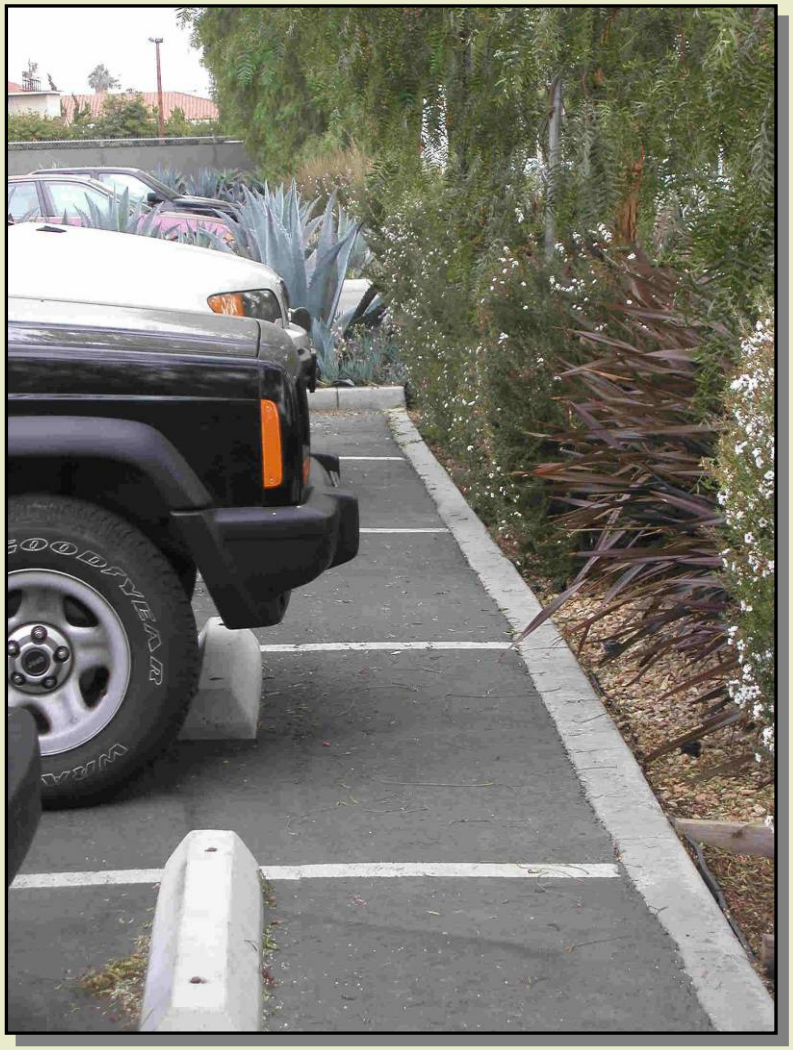
	Broadous School, Pacoima	IMAX Office Bldg, Santa Monica	Hall House, South LA	Metal Recycler, Los Angeles	Veterans Park, Long Beach	Recycling Facility, Sun Valley
Site Type	School, Playground	Commercial, Parking lot & roof	Residential, roof & driveway	Industrial, Paved yard	Public Park, Parking lot	Industrial, Paved yard
Design Rainfall, in	0.75	0.75	10	0.75	0.75	0.75
Catchment Area (est), ft^2	305,000	1) 47,916 roof 2) 68,390 parking lot	3,000	37,200	21,200	1) 51,000 roof 2) 75,000 paved yard
BMP Inlet	Sheet flow direct to pretreatment separator	1) Roof drain to dry well 2) Sheet flow into landscape strip	1) Roof drain to landscaping 2) Sheet flow to driveway drain	Sheet flow direct to sedimentation basin	Sheet flow to catch basin; piped to buried sedimentation vault	1) Roof drain direct to buried perforated pipes 2) Sheet flow direct to sedimentation basin
Sediment Removal	Yes	No	Yes	Yes	Yes	1) No 2) Yes
Oil/Grease Removal	Yes	No	Yes	Yes	No	1) No 2) Yes
Recharge Method	Buried infiltration units in gravel bed	Direct through soil	Buried dry well	Buried perforated pipeline in gravel bed	Buried perforated pipeline in gravel bed	Buried perforated pipeline in gravel bed
Depth to Groundwater	155 feet	32 feet	N/A	23 feet	225 feet	350 feet

Monitoring Program

Summary of Analytical Suite

Category	Stormwater and wells	Lysimeters
General Minerals	X	X
Trace Metals (total & dissolved)	X	X
Oil and Grease	X	residential
Perchlorate	X	X
Glyphosate	X	park
Volatile organic compounds (VOCs)	X	X
Semi-volatile organic compounds (SVOCs)	X	
NDMA	X	
Surfactants	X	
Bacteria (total coliform, fecal coliform, e. coli)	X	X

BMPs to Capture Stormwater Runoff for Infiltration



Monitoring Results: Five Years of Data

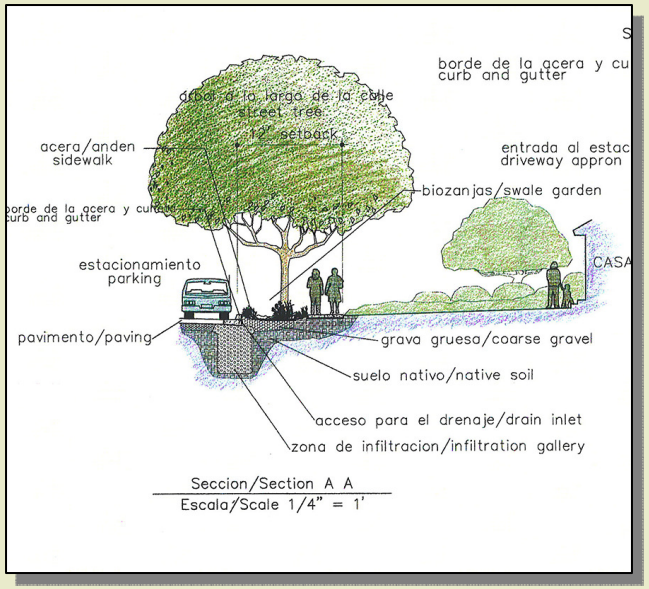
Infiltration Did Not Negatively Impact Groundwater

- Concentrations in groundwater did not correspond to stormwater concentrations
- Groundwater quality is stable or improved for most constituents at sites with shallow groundwater
  - Bacteria: removed by soil
  - VOCs: no impacts detected in groundwater
  - Inorganic groundwater constituents show no or decreasing trends in concentrations

Phase III: Neighborhood Demonstration Project

Implement BMPs in public ROW and on private property that will:

- ✓ *Capture stormwater and dry-weather flows to reduce runoff*
- ✓ *Recharge groundwater*
- ✓ *Reduce outdoor use to conserve water*
- ✓ *Increase infiltration by reducing impermeable surface area*
- ✓ *Increase community awareness of watershed issues*
- ✓ *Enhance neighborhood aesthetics*
- ✓ *Provide proof of concept*



Monitor storm flow and water quality pre- and post- construction

Project Team

Project Management

Los Angeles and San Gabriel Rivers Watershed Council

Project Management Support

TreePeople - Rebecca Drayse, Melinda Kelley

Community Engagement

TreePeople - Rebecca Drayse, Melinda Kelley

Urban Semillas - Miguel Luna

Engineering

Geomatrix - Marty Spongberg

Landscape Design & LID

Dudek - Guy Stivers

Wilson Environmental Design - Daniel Wilson

Project Construction

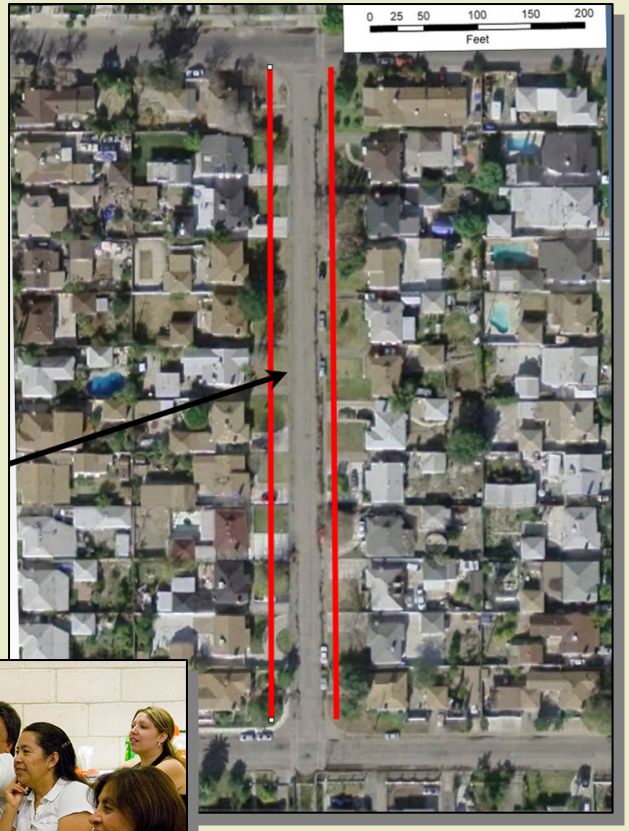
City of Los Angeles, Bureau of Street Services

Elmer Avenue Project Funding Partners

City of Los Angeles Department of Water & Power
City of Los Angeles Watershed Protection Division
City of Santa Monica Environmental Programs
County of Los Angeles Department of Public Works
Department of Water Resources
Metropolitan Water District of Southern California
Regional Water Quality Control Board, LA Region
TreePeople
University of California, Riverside
U. S. Bureau of Reclamation
Water Replenishment District of Southern California

Site Selection Criteria

- Required Criteria (Pass/Fail):
  - Predominantly single-family residential land use
  - Appropriate soils for infiltration
  - Street width and use adequate for BMP installation
- Preliminary Evaluation
  - Size and land use
  - Physical characteristics
  - Neighborhood demographics
  - Project readiness
- Additional Criteria
  - Willing community
  - Ability to attract funding
  - Political support

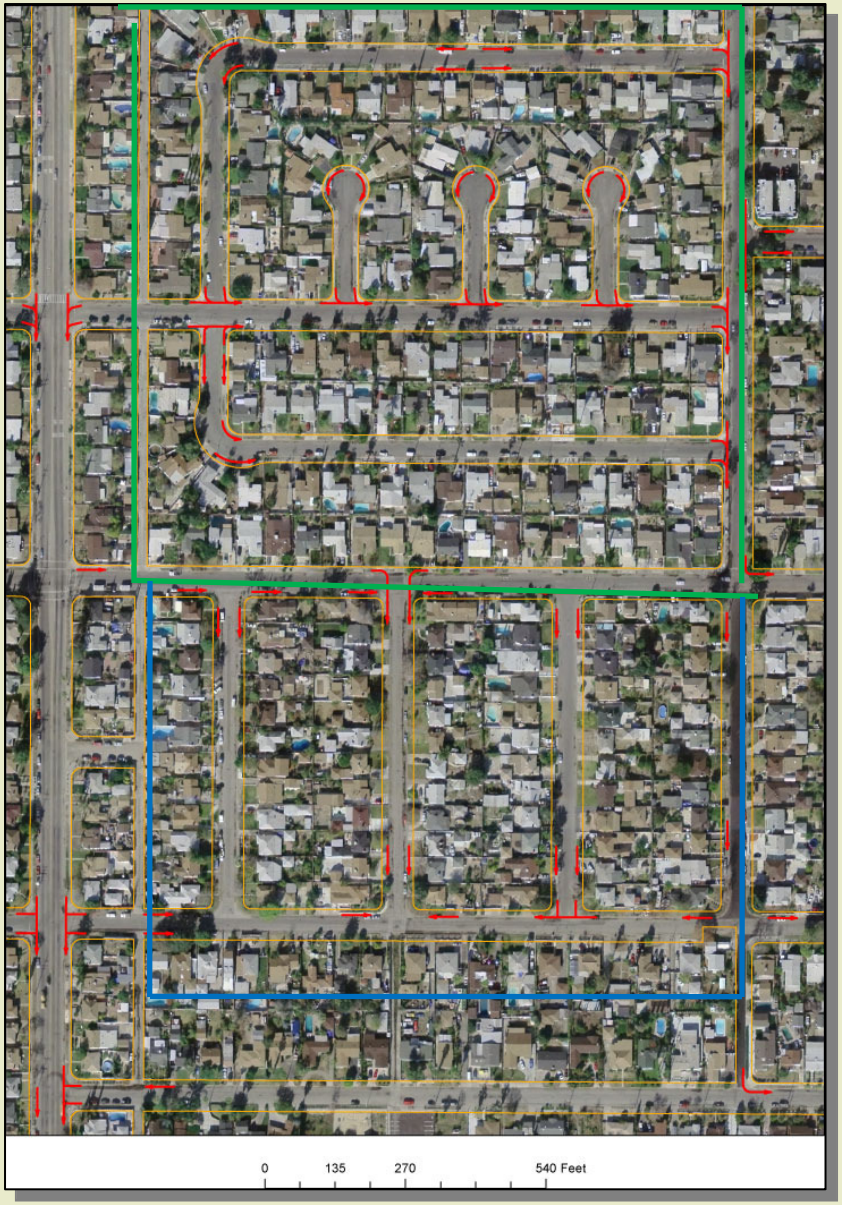


Sun Valley, CA 91352

- *Chronic flooding*
- *Lack of storm drain system*
- *Appropriate soils for infiltration*
- *Newly adopted watershed plan*
- *Political and agency support*

Elmer Avenue

Elmer Avenue

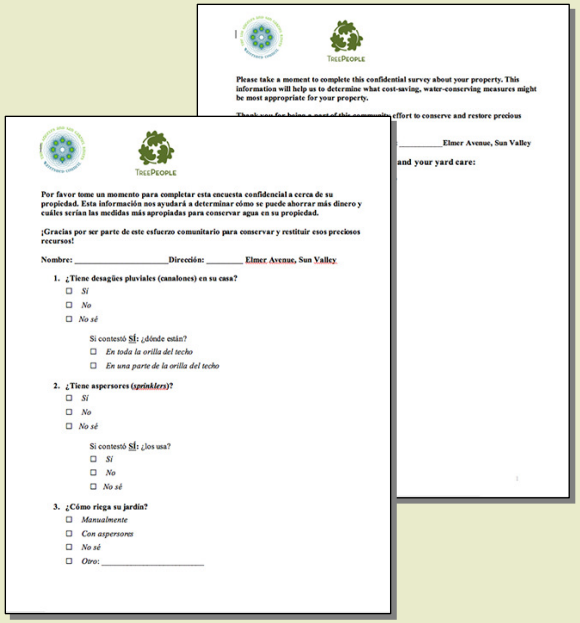


Additional challenges and opportunities

Involving the Community

Canvassing

- Asking questions
- Listening
- Gauging project interest
- Watershed education
- Surveys



TREEPEOPLE

Please take a moment to complete this confidential survey about your property. This informatioa will help us to determine what cost-saving, water-conserving measures might be most appropriate for your property.

Thank you for being a part of this community effort to conserve and restore precious

_____Elmer Avenue, Sun Valley

and your yard care:

TREEPEOPLE

Por favor tome un momento para completar esta encuesta confidencial a cerca de su propiedad. Esta información nos ayudará a determinar cómo se puede ahorrar más dinero y cuáles serían las medidas más apropiadas para conservar agua en su propiedad.

¡Gracias por ser parte de este esfuerzo comunitario para conservar y restituir esos preciosos recursos!

Nombre: _____Dirección: _____ Elmer Avenue, Sun Valley

1. ¿Tiene desagües pluviales (canalones) en su casa?
   - ☐ *Sí*
   - ☐ *No*
   - ☐ *No sé*

   Si contestó SÍ: ¿dónde están?
   - ☐ *En toda la orilla del techo*
   - ☐ *En una parte de la orilla del techo*

2. ¿Tiene aspersores (*sprinklers*)?
   - ☐ *Sí*
   - ☐ *No*
   - ☐ *No sé*

   Si contestó SÍ: ¿los usa?
   - ☐ *Sí*
   - ☐ *No*
   - ☐ *No sé*

3. ¿Cómo riega su jardín?
   - ☐ *Manualmente*
   - ☐ *Con aspersores*
   - ☐ *No sé*
   - ☐ *Otro:* _____

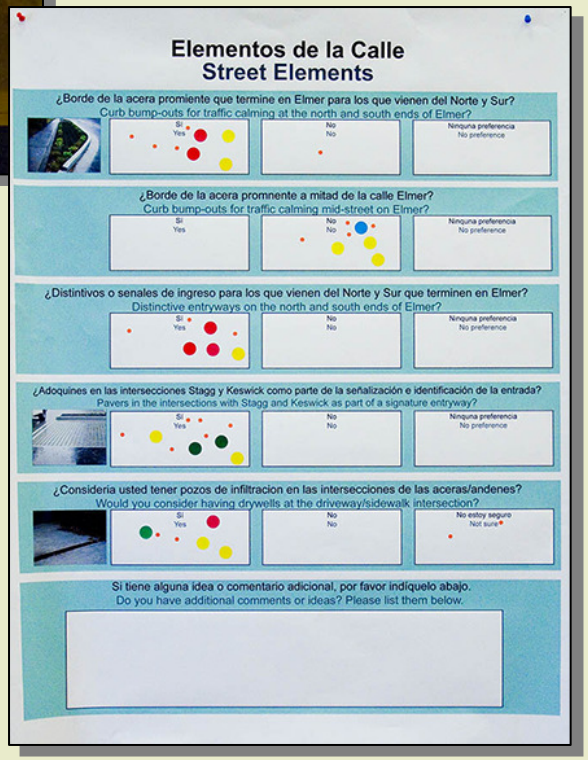
5 community meetings

- Program introduction
- ROW design workshop
- Design review
- Private property workshop

Involving the Community

Taking it to the street

Involving the Community



Elementos de la Calle
Street Elements

¿Borde de la acera promiente que termine en Elmer para los que vienen del Norte y Sur?
Curb bump-outs for traffic calming at the north and south ends of Elmer?
Sí / Yes — No / No — Ninguna preferencia / No preference

¿Borde de la acera promnente a mitad de la calle Elmer?
Curb bump-outs for traffic calming mid-street on Elmer?
Sí / Yes — No / No — Ninguna preferencia / No preference

¿Distintivos o senales de ingreso para los que vienen del Norte y Sur que terminen en Elmer?
Distinctive entryways on the north and south ends of Elmer?
Sí / Yes — No / No — Ninguna preferencia / No preference

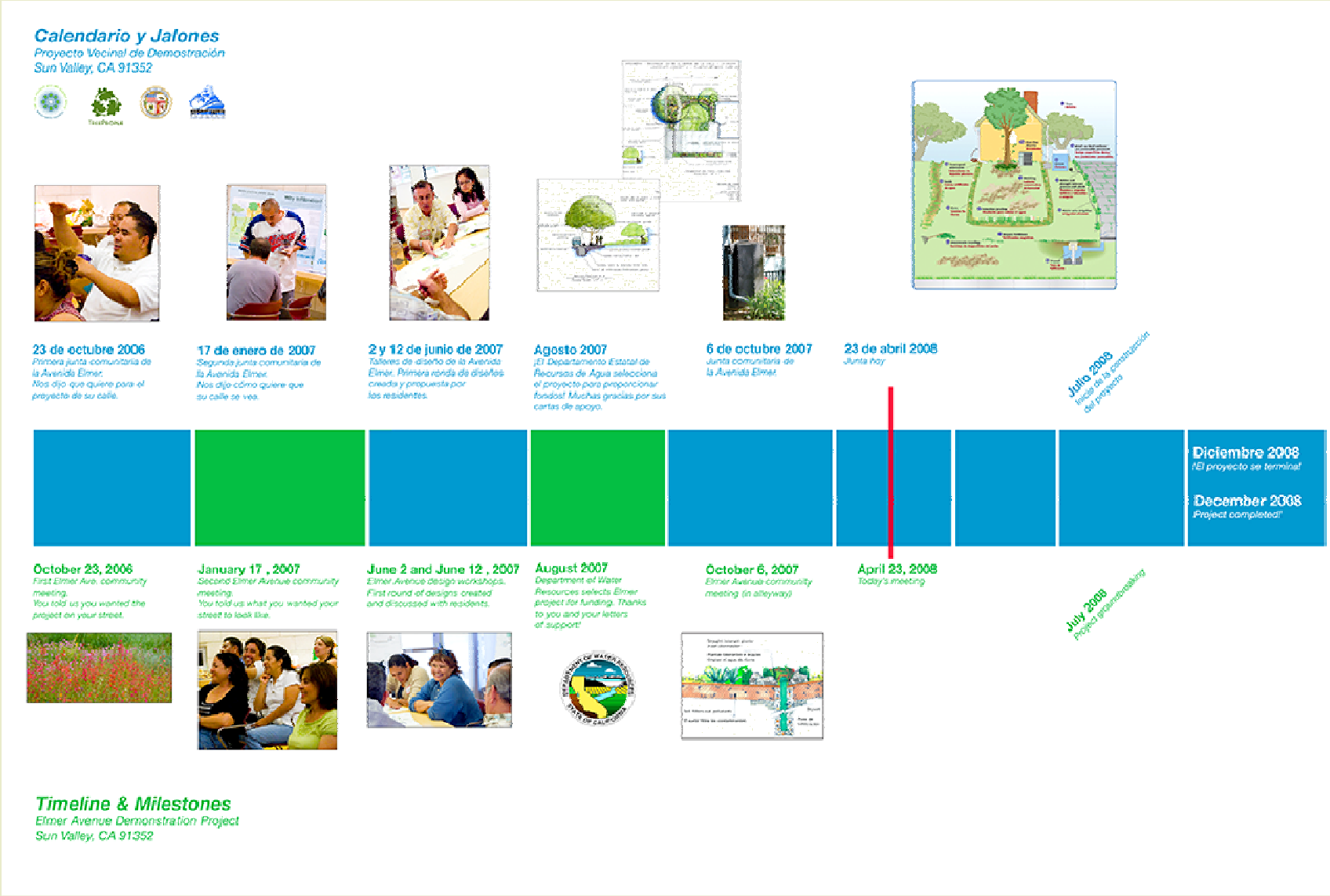
¿Adoquines en las intersecciones Stagg y Keswick como parte de la señalización e identificación de la entrada?
Pavers in the intersections with Stagg and Keswick as part of a signature entryway?
Sí / Yes — No / No — Ninguna preferencia / No preference

¿Consideria usted tener pozos de infiltracion en las intersecciones de las aceras/andenes?
Would you consider having drywells at the driveway/sidewalk intersection?
Sí / Yes — No / No — No estoy seguro / Not sure

Si tiene alguna idea o comentario adicional, por favor indíquelo abajo.
Do you have additional comments or ideas? Please list them below.

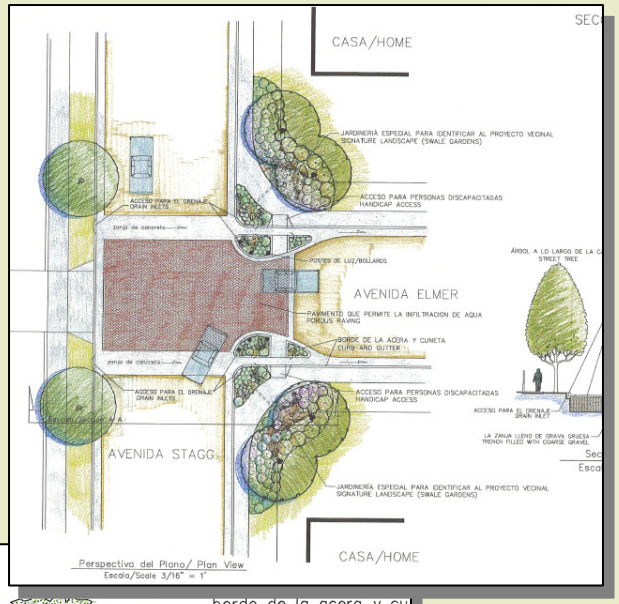
- *Education*
- *Participation*
- *Listening*
- *Flexibility*
- *Variety*
- *Regular contact*
- *Adaptability*

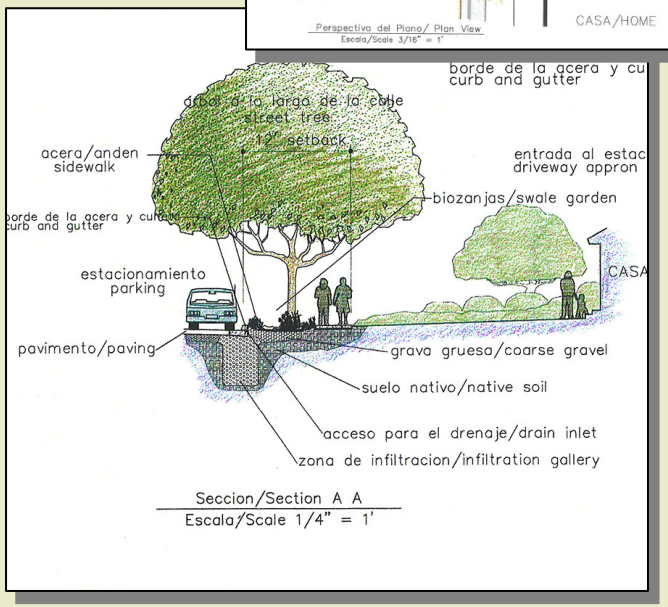
Neighborhood Outreach

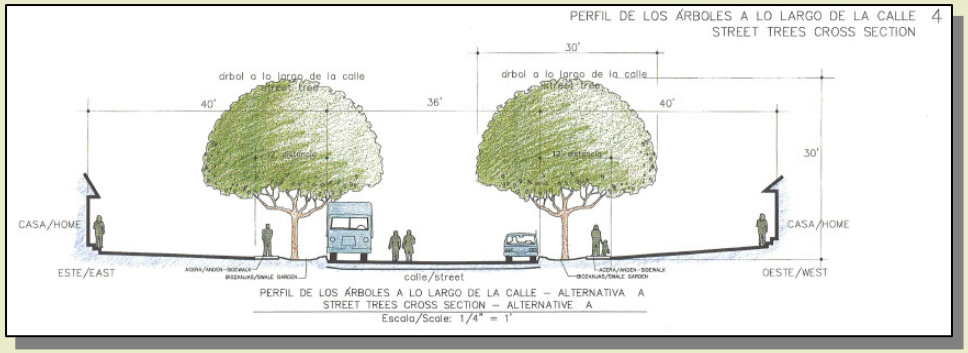


Elmer Retrofit Conceptual Design Components

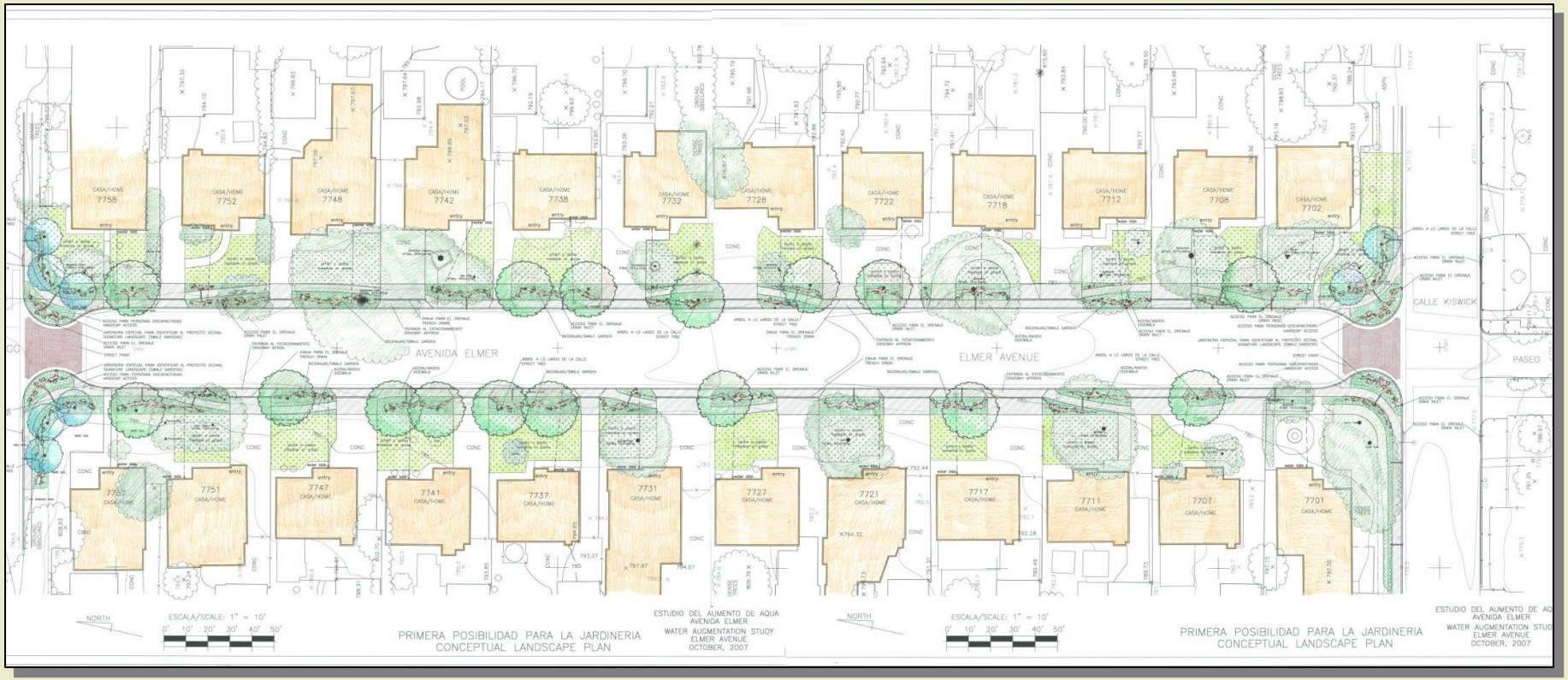
- *Infiltration gallery*
- *Vegetated swales to hold & absorb stormwater*
- *Drought-tolerant and native landscaping*
- *Rain gardens*
- *Meandering sidewalks*
- *Additional trees and green space*
- *Increased permeable surfaces*
- *Rainwater collection for irrigation*



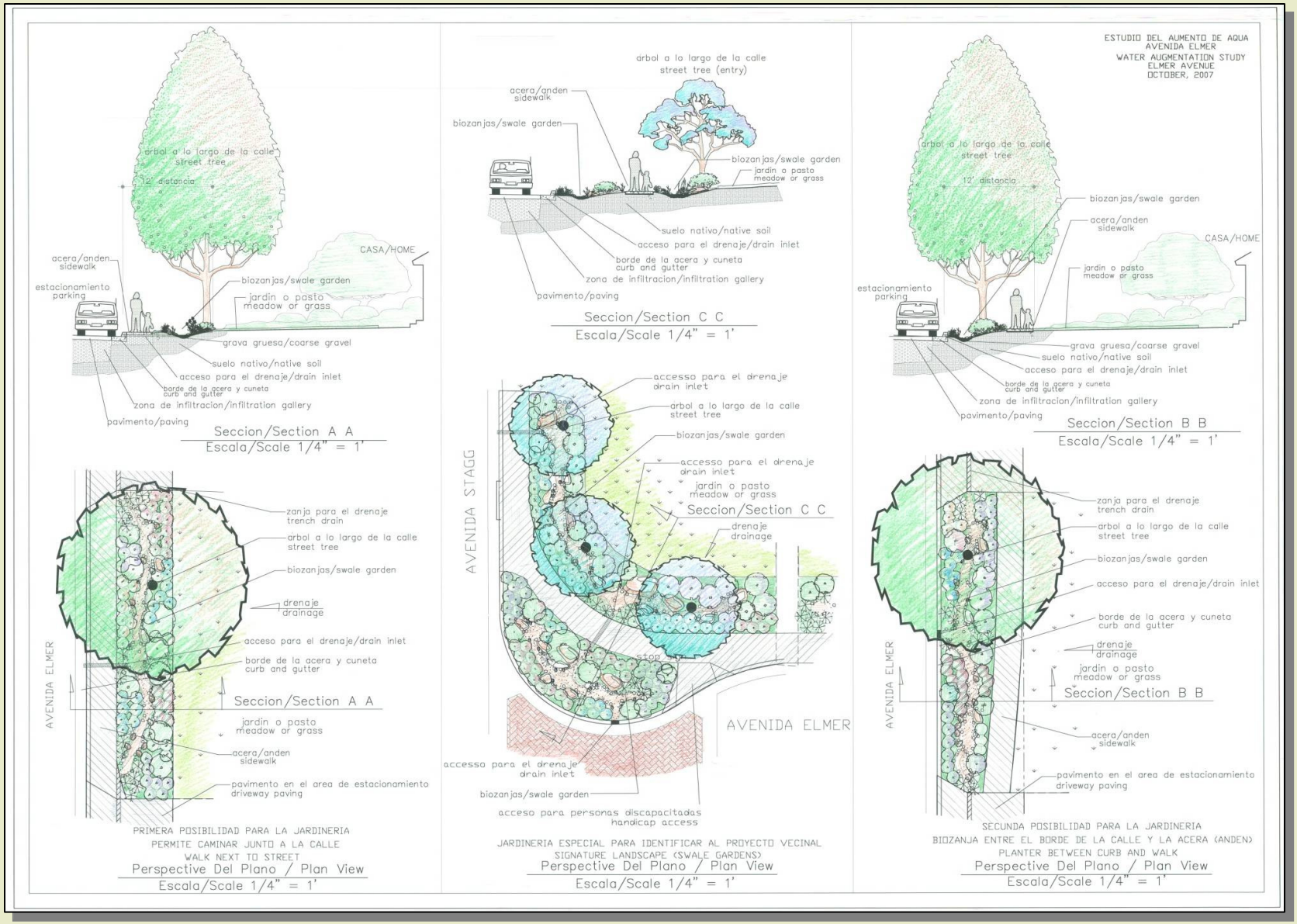




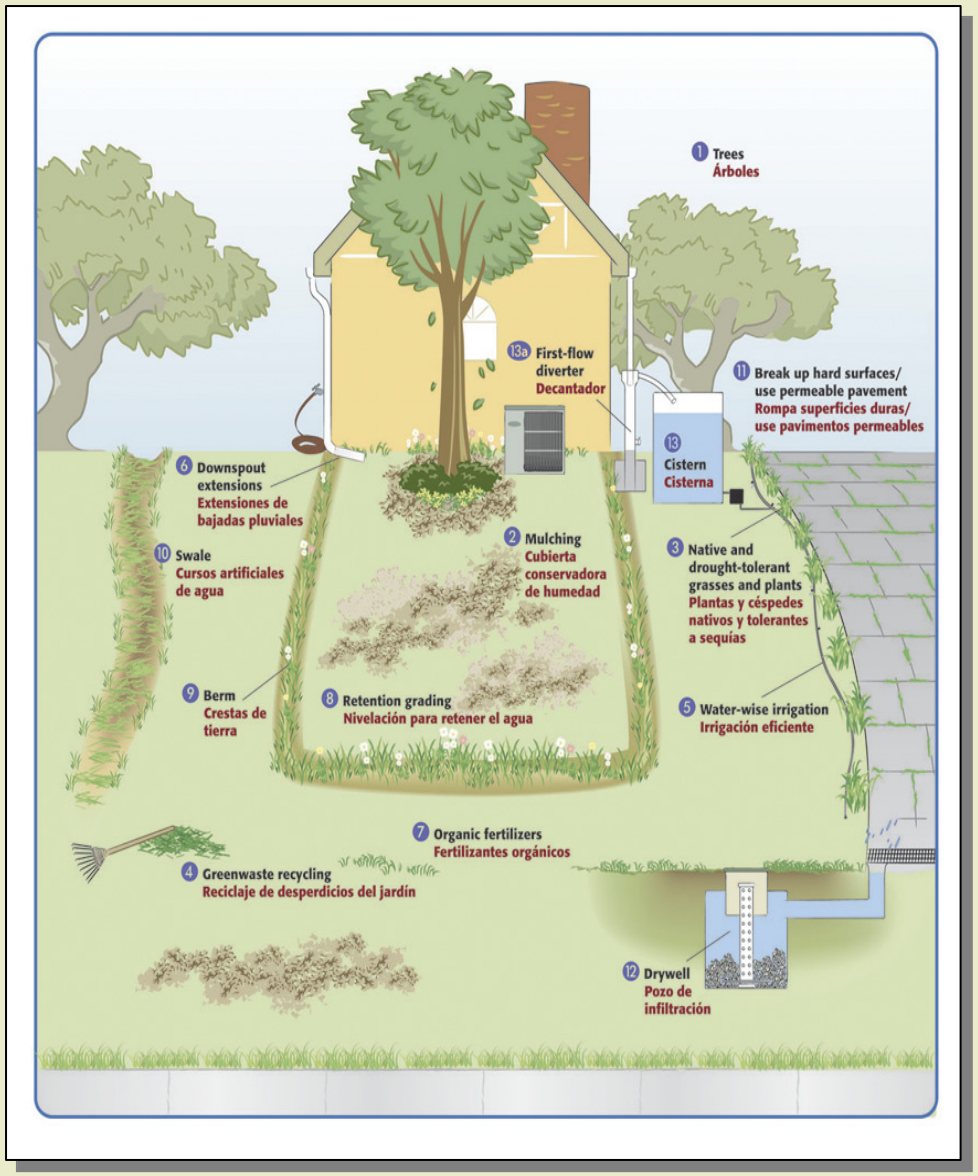
Elmer Retrofit Conceptual Design

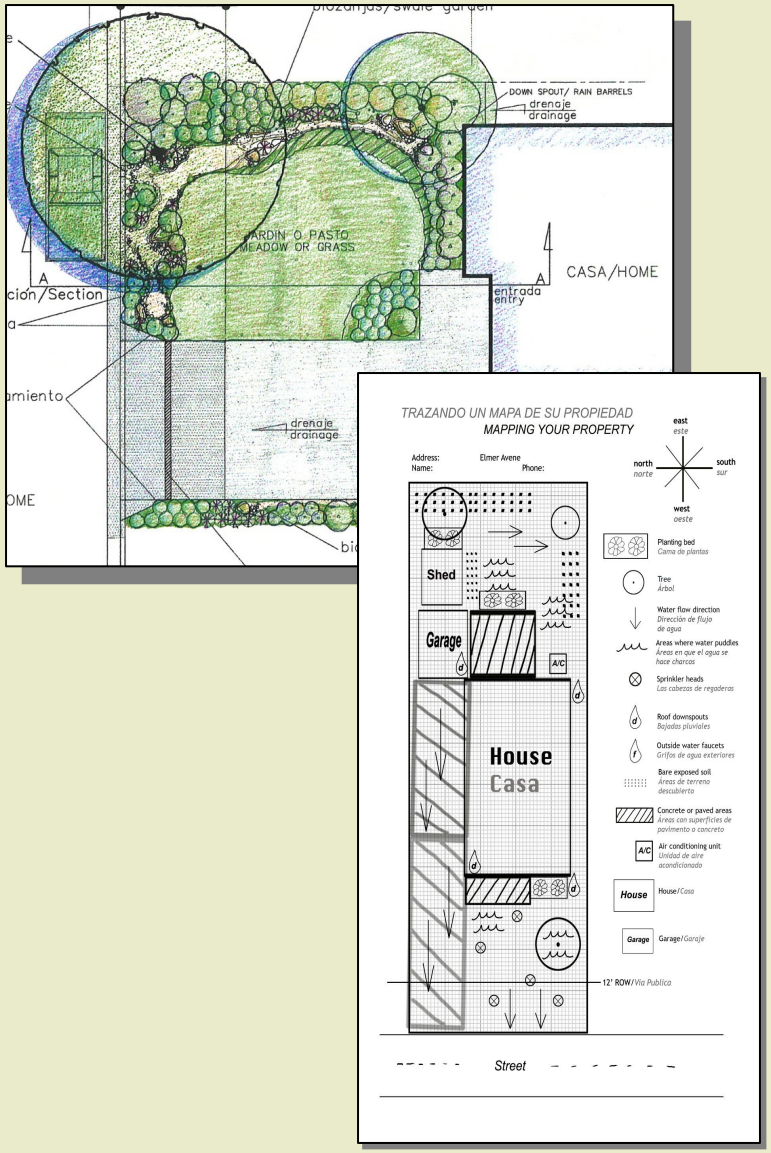


Elmer Retrofit Conceptual Design

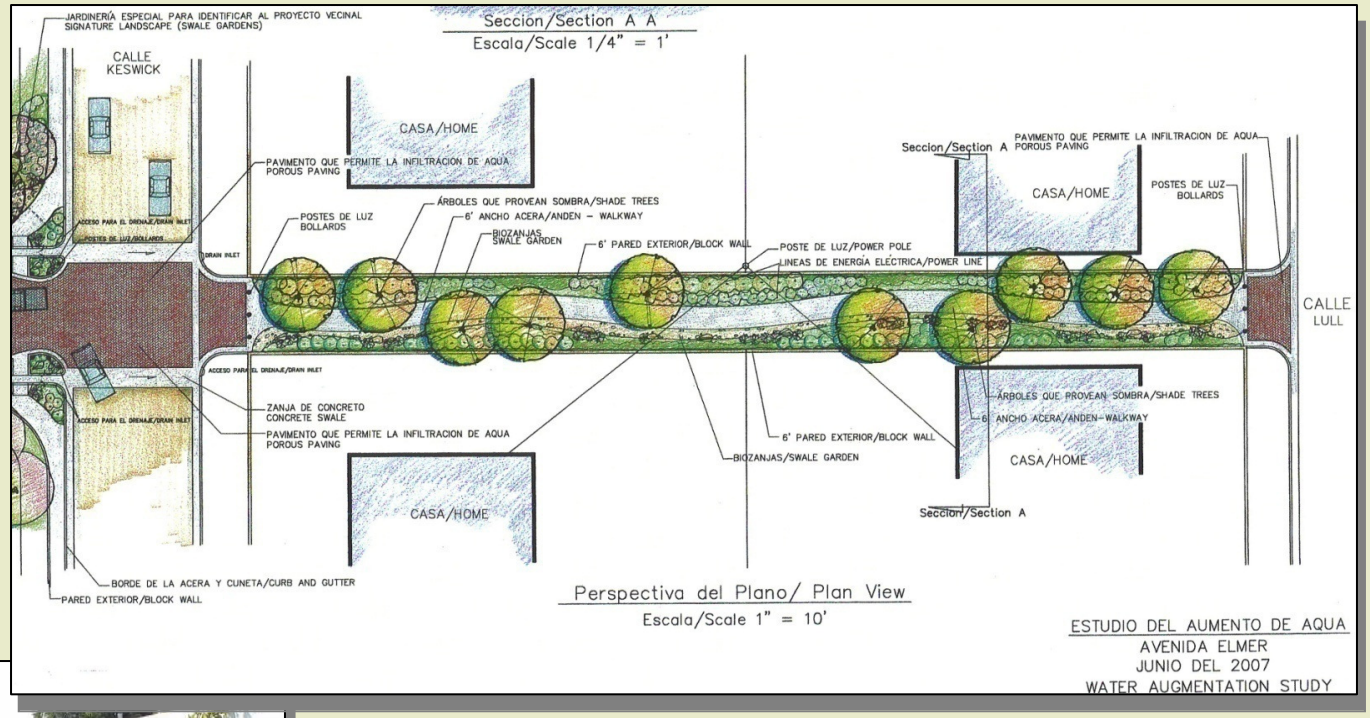


Elmer Avenue Neighborhood Retrofit
Private Property Components





Elmer Avenue Paseo Opportunity



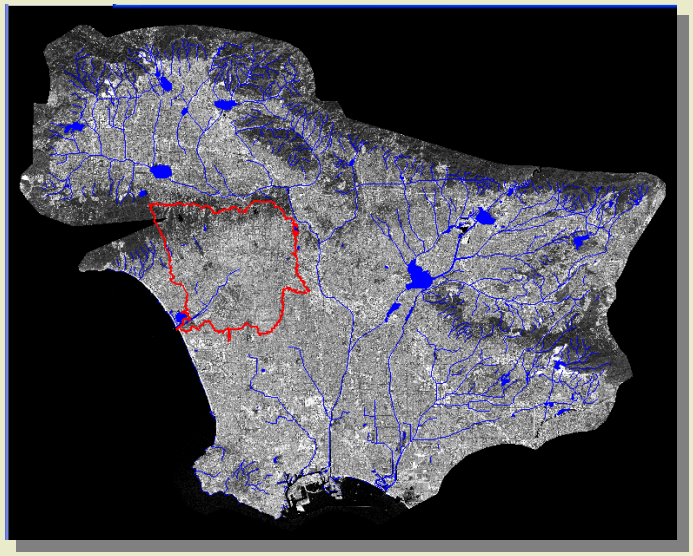
- *Additional stormwater capture and infiltration*
- *Improved walkway*
- *Greening*
- *Benches and lights*
- *Increased open space*
- *Improved aesthetics*

Next Steps - Neighborhood Retrofit

- Construction
  - *ROW*
  - *Private property*
- Trainings/workshops
- Monitoring

Next Steps
Water Augmentation Study

- Los Angeles Basin Infiltration Model
- Cost/benefit analysis
- Regional regulatory framework



Questions?

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