

Understanding Barriers to LID Implementation

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(SCVURPPP)



Presentation Outline

- Potential Barriers
 - Local Policies, Codes, and Ordinances
 - State and Federal regulations
 - Public agency/department requirements
 - Public perception and acceptance
 - Site constraints
- SCVURPPP example – PCO review and “better site design” dialogues
- Lessons learned and recommendations



Potential Barriers to LID

- Local Policies, Codes, and Ordinances
 - Minimum street and driveway width requirements
 - Minimum parking requirements or ratios
 - Curb requirements for streets and parking lot islands
 - Requirements for roof downspouts to be directly connected to a storm drain, preventing roof runoff from being discharged to landscaping
 - Grading requirements that prohibit ponding of stormwater in landscaped areas
- Hillside development ordinances

Potential Barriers to LID

- State and Federal Regulations
 - ADA requirements that dictate sidewalk width, parking locations, and stability of surfaces
 - State and National Building and Plumbing Codes
 - Issues with rainwater harvesting and use in buildings:
 - California Plumbing Code requires dual plumbing to separate potable water and other water sources to toilets
 - Concern with cross connection and backflow
 - Potable water needed for make up water
 - No statewide guidance for use of rainwater in buildings

Potential Barriers to LID

- Public agency/department requirements/concerns
 - Fire Department requirements for access:
 - Minimum 20-ft travel lane; 36-ft inside turning radius
 - Strength of paving to support large vehicle load
 - Public Works Department design standards for curb & gutter, street widths, maintenance
 - Vector Control Agency concerns about standing water breeding mosquitoes
 - Parks Department concerns about use of parks for stormwater detention/infiltration



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Soggy playing fields

- Responsibility for maintenance



Potential Barriers to LID

- Public perception and acceptance
 - Desire for traditional landscaping, paving, curb & gutter may not be compatible with LID features
 - Concern about soggy lawns and standing water in yard
 - May or may not be willing to maintain LID features on their property as designed
 - Concern about whether narrow streets will allow emergency vehicle, garbage truck and delivery truck access
 - Demand for adequate parking
- Lenders wary of new approaches, long term impacts on building integrity, and potential liability



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Potential Barriers to LID

- Site constraints
 - Lack of space
 - Potential slope instability
 - Limited or no infiltration capacity
 - Clayey soils
 - Contaminated soils or groundwater
 - High groundwater table
 - Potential contaminants in runoff due to land use

SCVURPPP Approach

- “Development Policies Comparison Project” (2003)
 - Compared 15 permittees’ policies, codes and ordinances with a checklist of desirable LID elements
 - Local agencies committed to making changes to facilitate implementation of site design requirements
- “Understanding Hurdles to Better Site Design”
 - 4 Dialogues – Understanding Hurdles
 - 1 Workshop – Overcoming Hurdles (Success Stories)
- Site Design Examples Guidebook



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Goals of the Dialogues

- Understand underlying issues to potential conflicts that may hinder the implementation of site designs to protect water quality
 - Secure Experts from Different Fields
 - Obtain Stakeholder Input and Insight
 - Understand the Basis to the Conflict
 - Brainstorm Potential Solutions



Dialogue Results Summary Table

- Site Design Goal
- Potential Conflict
- Underlying Issues
- Potential Solutions
- Notes/Comments

Topics:

Narrow Streets

Cul-de-sacs/Turnarounds

Permeable Pavements

Drainage to Swales/Biofilters

Buildings (Downspouts, Footprints)

Green Roofs

Parking Areas

Structural Soils

Highlights

- Streets & Fire/Access Issues
- Drainage to Landscaping
- Building Better Buildings
- Parking Lots and Walkways

Narrow Streets & Safety Issues

- Potential Conflicts
 - Fire, Bus, and Delivery Access Issues
 - Bicycle and Pedestrian Issues
- Underlying Issues
 - Response Time
 - Fire trucks- 2 times wider, longer
 - 20-foot travel lane (national standard)
 - Mutual Aid
 - Ingress & Egress
 - Problems not easily undone
 - On-street parking inhibits access



Narrow Streets & Safety Issues

- Potential Solutions
 - Separate alley ways-parking
 - Grid Streets
 - Hydrants within 150 feet
 - Use entire street ROW
 - Turf block (70,000 lb load)
 - Sprinklers in Residences
 - Police Cars Defibrillators
 - Parking Pullouts



Permeable Pavements

- Potential Conflicts
 - Longevity
 - Liability --Tripping
 - Clogging/Soil Compaction
 - Disabled Access
- Underlying Issues
 - Load Requirements: 70,000 lb
 - Financing & Insurance Costs Increase with Perceived Risk
 - Clay soils/compacted soils restrict infiltration
 - Stable/Slip-resistant surfaces for disabled



Permeable Pavements

- Potential Solutions
 - Turf Block
 - Proper Design
 - Outreach to property owners
 - Outreach to fiscal lenders
 - Pilot projects with larger developers to show success
 - Can be ADA compliant
 - [More experience now]



Drainage to Landscaping Swales/Biofilters

- Potential Conflicts/Underlying Issues
 - Effectiveness in Clay/Compacted Soils:
 - Not truly permeable, localized flooding causing accidents, harming road base
 - Infiltration Concerns
 - Risk of groundwater contamination
 - Curb Cuts
 - Blockage
 - Curb cut too close to drain inlet may short-circuit treatment



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Drainage to Swales/Biofilters

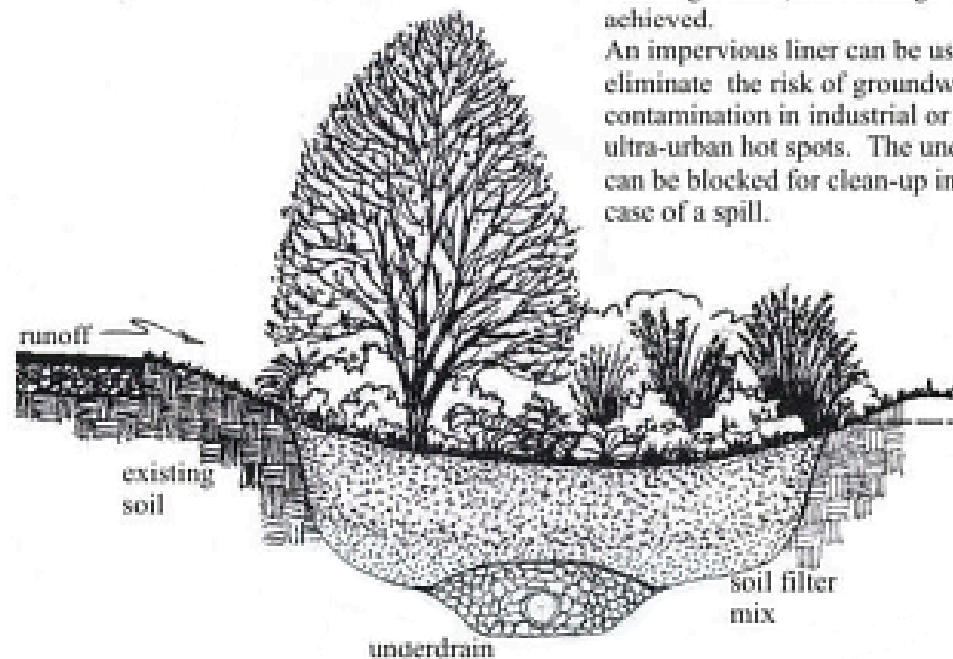
- Potential Solutions
 - Clay Soils: Use bioretention systems
 - amended soils
 - underdrains
 - Design so infiltration through surface soils provides treatment.

HIGH FILTRATION FACILITY

The use of an underdrain ensures that the facility will drain at the desired rate.

Partial groundwater recharge is also achieved.

An impervious liner can be used to eliminate the risk of groundwater contamination in industrial or ultra-urban hot spots. The underdrain can be blocked for clean-up in the case of a spill.



Source: Low-Impact Development Center Inc.

Drainage to Swales/Biofilters



- Underlying Issues and Potential Solutions
 - Curb Cuts: Suggest curb cuts at least 1 foot in length, spaced so no short-circuiting treatment
 - Scouring: Install Cobbles
 - Undermine Roadbase: Design with proper barriers
 - Maintenance: Use plants that do not require frequent mowing

Drainage to Landscaping Swales/Biofilters—Maintenance

- Potential Conflicts/Underlying Issues



- Amount of Maintenance: Mowing, watering, debris removal
- Soil Contamination Concerns: Cost to remove/ Liability Issues
- Vector Control Issues: West Nile Virus

Drainage to Swales/Biofilters— Maintenance



- Potential Solutions
 - Maintenance: Costs should not be more than regular landscaping. Provide education.
 - Soil Contamination: USGS City of Fresno study (1995) and others: metals bind to top layer of soil, not hazardous waste
 - Vector: Design and maintain to drain within 72 hours

Disconnecting Roof Downspouts



- Potential Conflicts/Issues
 - Undermining Foundation
 - Water Too Close to Building
 - Cisterns: Vector control issues
 - Gutters Concentrate Flow
- Potential Solutions
 - Protect building foundation by 2% slope away
 - Cistern cover/maintenance
 - Pop-up emitters
 - Concrete barrier (e.g., planter box)

Reducing Parking Footprint

- **Potential Conflicts/Underlying Issues**
 - Costs: Surface parking lots less expensive than structures
 - Shared Parking: Fear Change in Land Use
 - Difficulty Obtaining Funding
 - Maximum Parking Ratios: Fear Non-Competitive



Reducing Parking Footprint

- **Potential Solutions**

- Shared Parking: City-owned lots, Agreements
- Provide Credit for parking structures for transit-oriented developers (savings on floor area)
- Lenders More Willing to Take Risks with Well Known, Larger Developers
- Parking Ratio: Incentives Rather than Requirements



Lessons Learned

- Interdepartmental Communication is Crucial
- Public Education is Equally Important
- Advocates Make it Happen
- Conflicts Need to be Solved on the Local Level
- *But* Fiscal Lending and Other Issues Need to Be Addressed on a Wider Scale
- Understanding Underlying Issues Can Lead to Mutually Beneficial Solutions