

WORKSHOP OUTLINE

Module 1 Introduction

Module 2 Rules Relating to Storm Drainage Standards

Module 3 Electronic Resource Library

Module 4 Examples



MODULE 1

INTRODUCTION



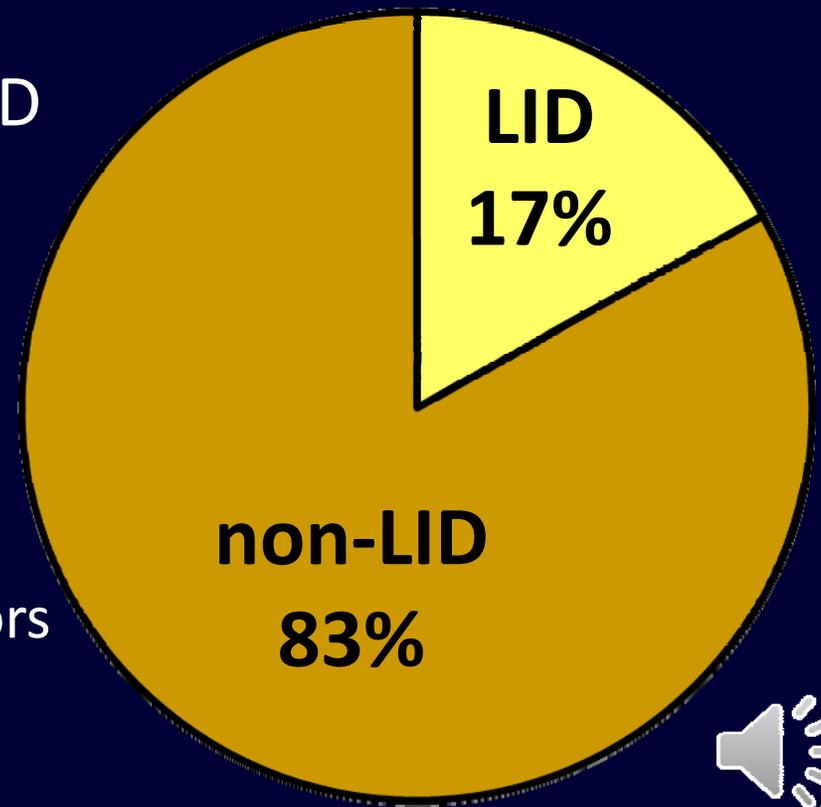
Reissued NPDES MS4 Permit requires stricter Water Quality standards for Post-Construction

- Low Impact Development (LID) standards must be added to the Rules Relating to Storm Drainage Standards
- LID standards must apply to all projects disturbing ≥ 1 acre, and smaller projects that have the potential to discharge pollutants to the City's MS4



LID is not an entirely new concept in Honolulu

- City BMP Database includes approx. 360 BMPs
- ~ 60 (17%) are considered LID
- ~ 300 (83%) are non-LID:
 - ~ 55 detention basins
 - ~ 115 catch basin inserts
 - ~ 130 hydrodynamic separators



INTRODUCTION

So the majority of the permanent treatment control BMPs in-place aren't considered LID



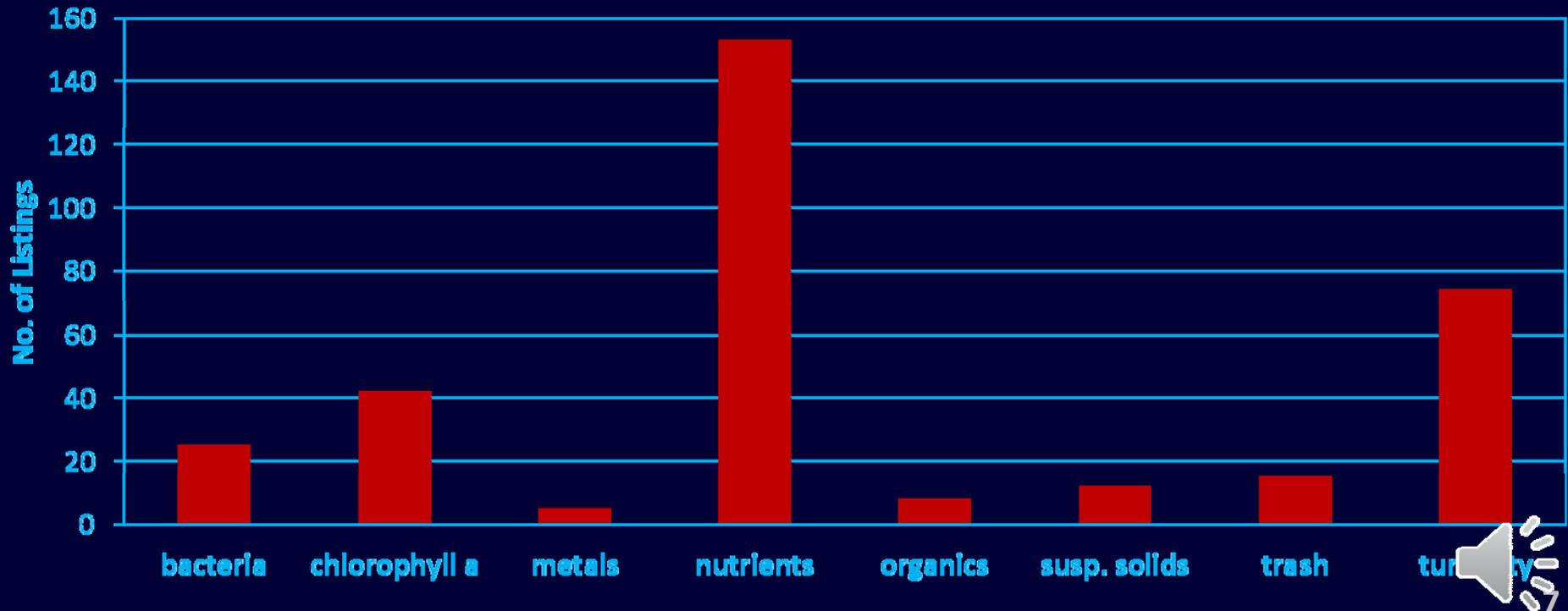
But they still improve water quality, right?



INTRODUCTION

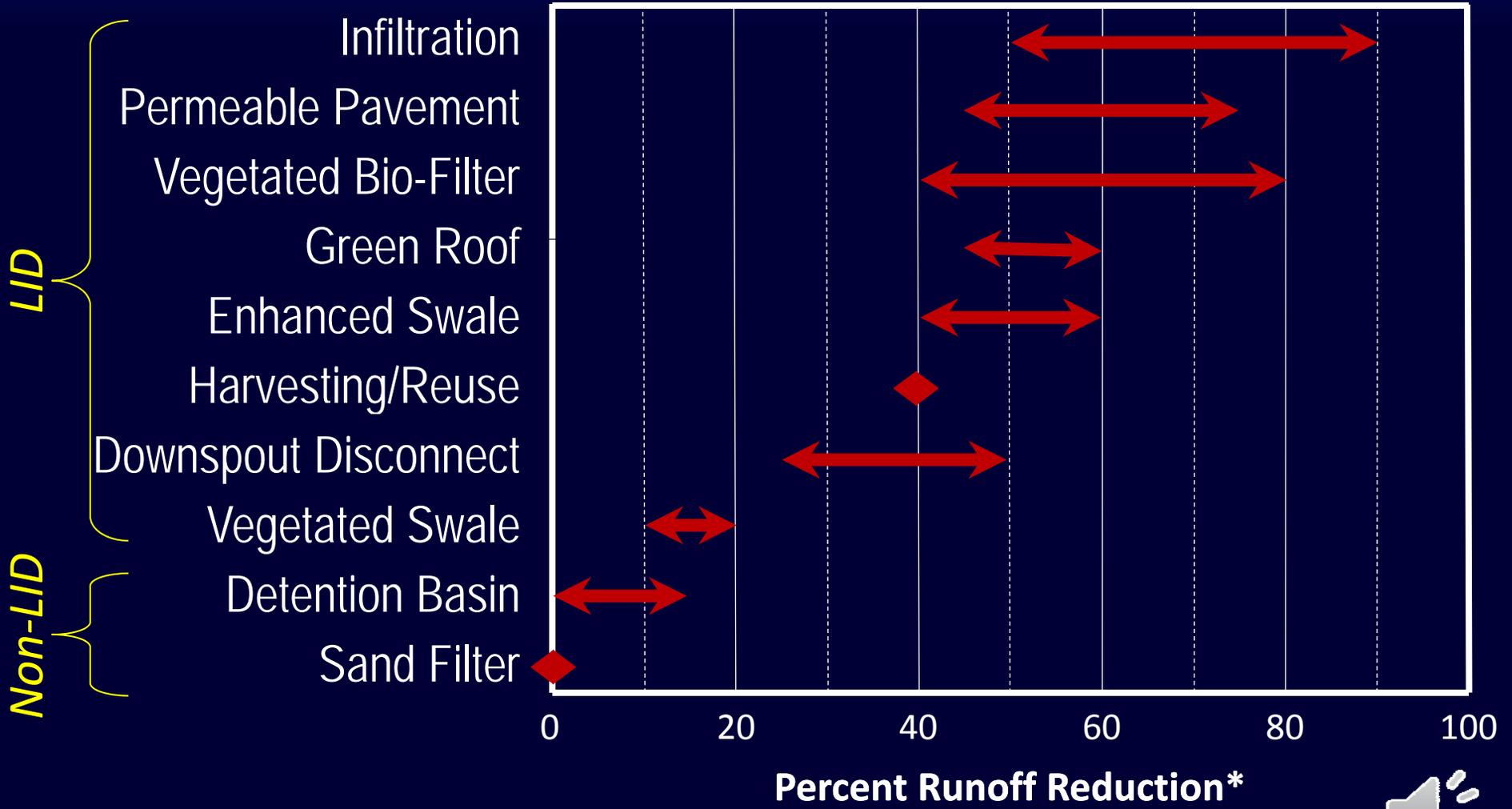
non-LID BMPs don't address all 303(d) pollutants

- 107 impaired waterbodies on Oahu
- 334 total pollutant listings
- non-LIDs address Susp. Solids, Trash, & Turbidity



INTRODUCTION

non-LID BMPs don't reduce Runoff Volumes



**Center for Watershed Protection, 2008*



INTRODUCTION



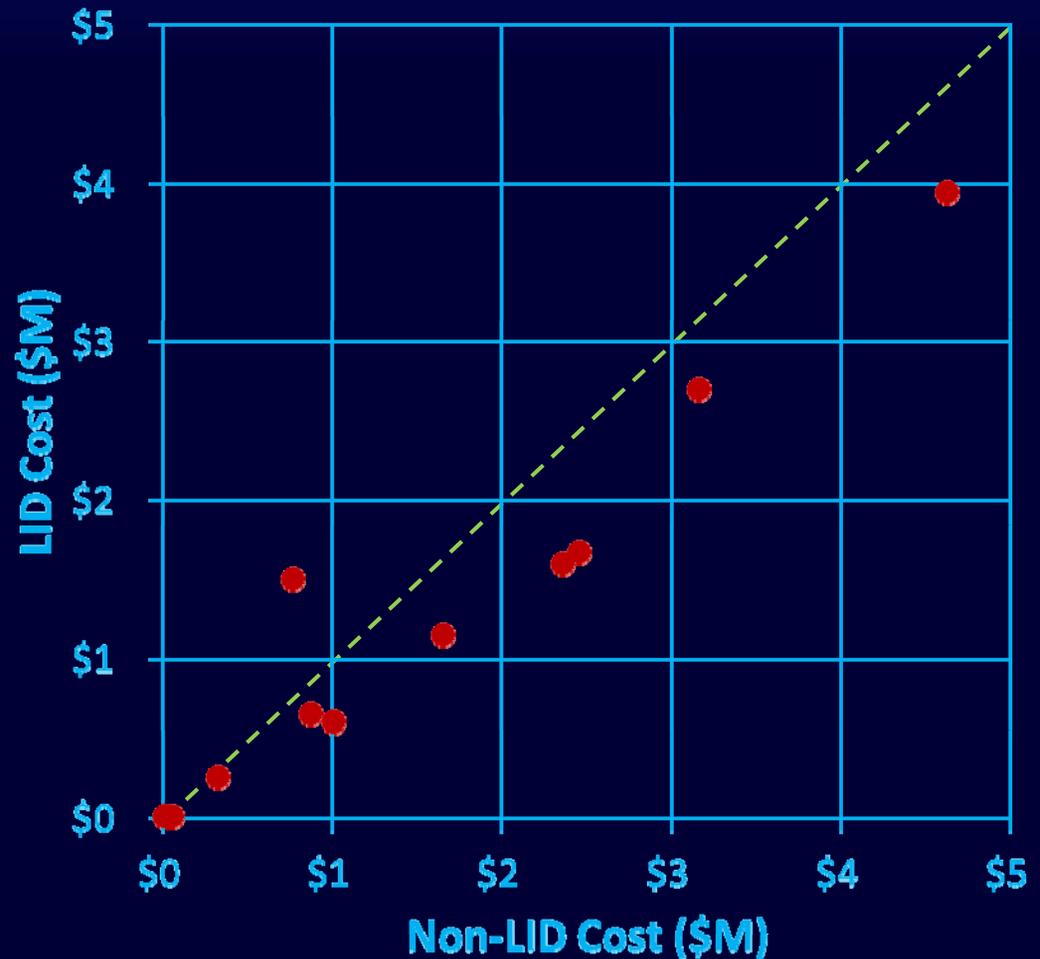
And, contrary to popular belief, LID practices are not necessarily more expensive than non-LID practices



INTRODUCTION

EPA Case Study Evaluation*

- 12 actual case studies comparing costs incurred/estimated for traditional treatment vs. LID
- 1 project had higher LID costs

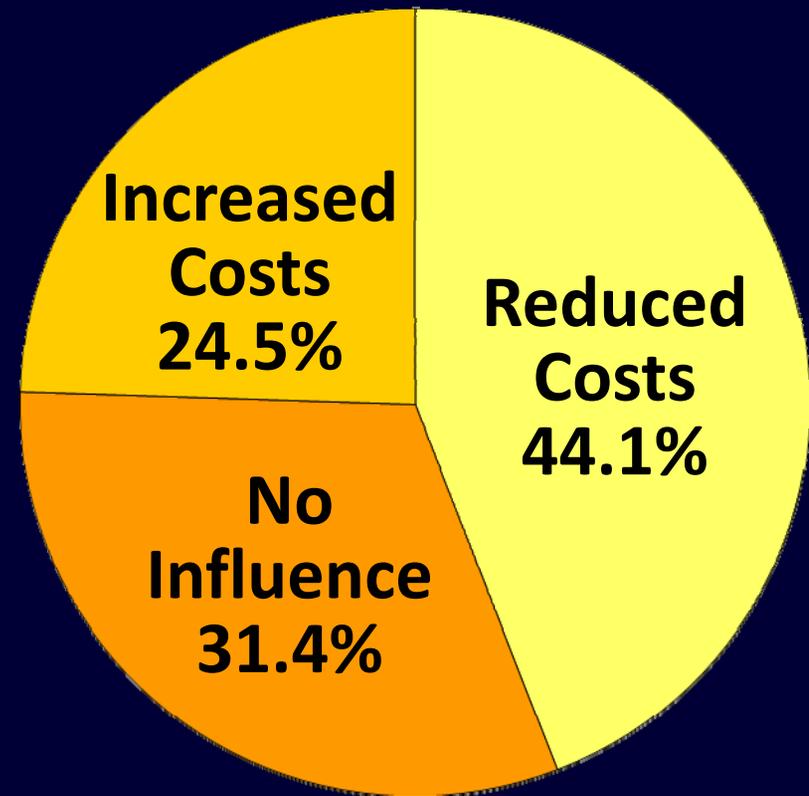


* *Reducing Stormwater Costs Through Low Impact Development (LID) Strategies and Practices. EPA 841-F-07-006. December 2007.*



American Society of Landscape Architect's (ASLA) Green Infrastructure Survey*

- 479 case studies from 43 states, D.C., and Canada
- Over 300 ASLA members and other practitioners were asked “Did use of green infrastructure increase costs?”



* *Banking on Green: A Look at How Green Infrastructure Can Save Municipalities Money and Provide Economic Benefits Community-wide, A Joint Report by American Rivers, WEF, ASLA, and ECONorthwest, 2012*



Technical Components of LID

Site Design Minimizing runoff volumes and preserving existing hydrology

Retention Keeping runoff on-site by infiltration and evapotranspiration

Biofiltration Removing pollutants from runoff by filtration, adsorption & biological uptake

Details for each are provided in the City's Storm Water BMP Guide



Approved LID Site Design Strategies

1. Conserve Natural Areas, Soils, and Vegetation
2. Minimize Disturbances to Natural Drainages
3. Minimize Soil Compaction
4. Minimize Impervious Surfaces
5. Direct Runoff to Landscaped Areas



Approved LID Retention & Biofiltration BMPs

Retention

1. Infiltration Basin
2. Infiltration Trench
3. Subsurface Infiltration
4. Dry Well
5. Bioretention Basin
6. Permeable Pavement

Biofiltration

1. Vegetated Bio-Filter
2. Green Roof
3. Enhanced Swale
4. Downspout Disconnection
5. Vegetated Swale
6. Vegetated Buffer Strip
7. Tree Box Filter



Module Summary



INTRODUCTION - SUMMARY

- Reissued Permit requires LID standards
- LID addresses more of Oahu's pollutants
- LID is better at reducing runoff volumes
- LID may save you money
- LID consists of Site Design, Retention, and Biofiltration



INTRODUCTION

For more information...

1. Reducing Stormwater Costs Through Low Impact Development (LID) Strategies and Practices, EPA, 2007.
2. Low Impact Development, A Practitioner's Guide, Hawaii Office of Planning, Coastal Zone Management Program, 2006.
3. County of Los Angeles Low Impact Development Standards Manual, County of Los Angeles, 2009.
4. Unified Facilities Criteria, Low Impact Development, US Department of Defense, 2010.
5. Low Impact Development Manual for Michigan, Southeast Michigan Council of Governments, 2008.
6. Low Impact Development Approaches Handbook, Clean Water Services, 2009.
7. California Stormwater Quality Association (CASQA), California LID Portal, <http://www.casqa.org/LID/tabid/240/Default.aspx>



End of Module 1

