

Basic Concepts and Applications

2010 International Low Impact Development Conference



1. LID Basics & Principles

2010 International Low Impact Development
Conference

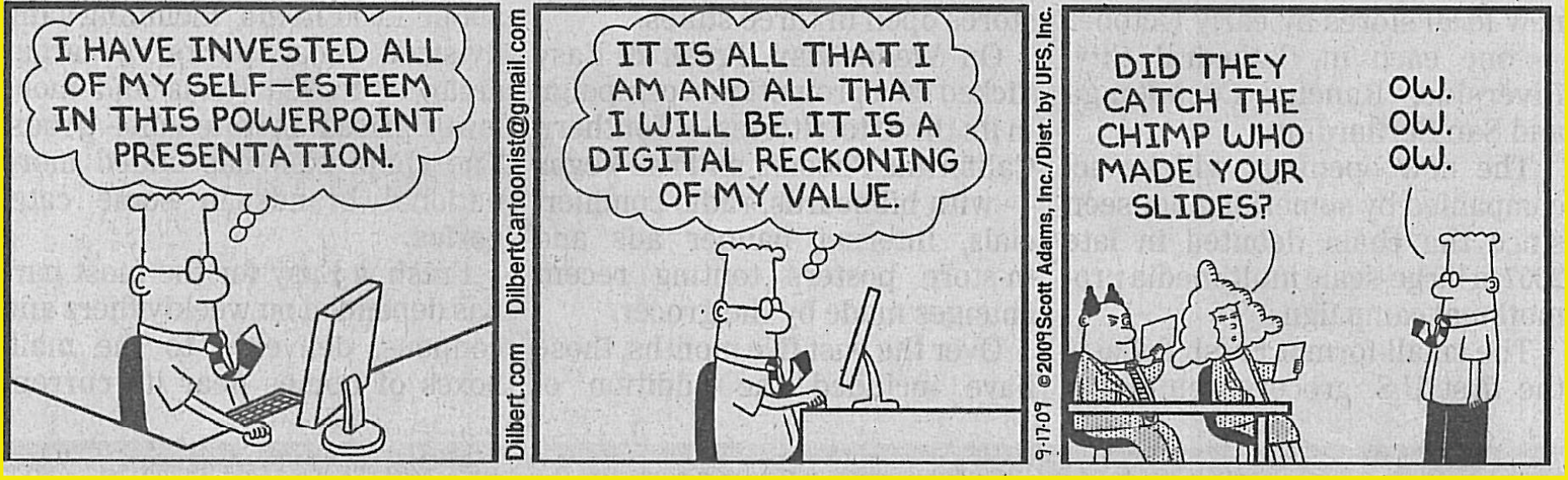
Matt Yeager
San Bernardino County Flood Control District



Introduction

Dilbert

By Scott Adams



Presentation Outline

- Impacts from Development
- Purpose of LID
- Definitions
- Frequently asked questions
 - **Misconceptions**

Impacts of Development



City of Los Angeles—1870s

<http://www.lapl.org>

Hollywood and Cahuenga—1900



Impacts of Development

Los Angeles—2000s



Sherman Oaks--1960



<http://www.lapl.org>

Impacts of Development



LOS ANGELES FROM SPACE

Unintended Environmental Consequences



Another problem caused by deforestation



ENVIRONMENTAL &
WATER RESOURCES
INSTITUTE



Watershed Changes

Changes Caused by Urbanization.

- **Impervious surface area increases**
 - **A runoff conveyance system is installed**
 - **Land use is changed (formerly natural vegetation or agriculture)**
 - **Topography is modified**
 - **Vegetative cover is modified**
 - **Direct flow modifications may occur (extractions, diversions, or effluent inputs)**
 - **Development encroaches on the stream corridor**
 - **Streams may be engineered, including channelization and/or hardening**
-

What is LID?



A site development strategy that emphasizes the integration of site planning and best management practices that mimic the natural hydrologic functions of a site.

LID is not just infiltration

Purpose of LID

- **Minimize impacts from development projects**
 - Land
 - Water (emphasized)
 - Air
- **Integrate site planning with best management practices (BMPs) to mimic the natural functions of a site**
 - Preserve natural areas/minimize land disturbance
 - Preserve natural system and processes
- **Re-evaluate the use/need for traditional infrastructure**
 - Decentralize stormwater management features



Re-evaluate the use/need for traditional infrastructure



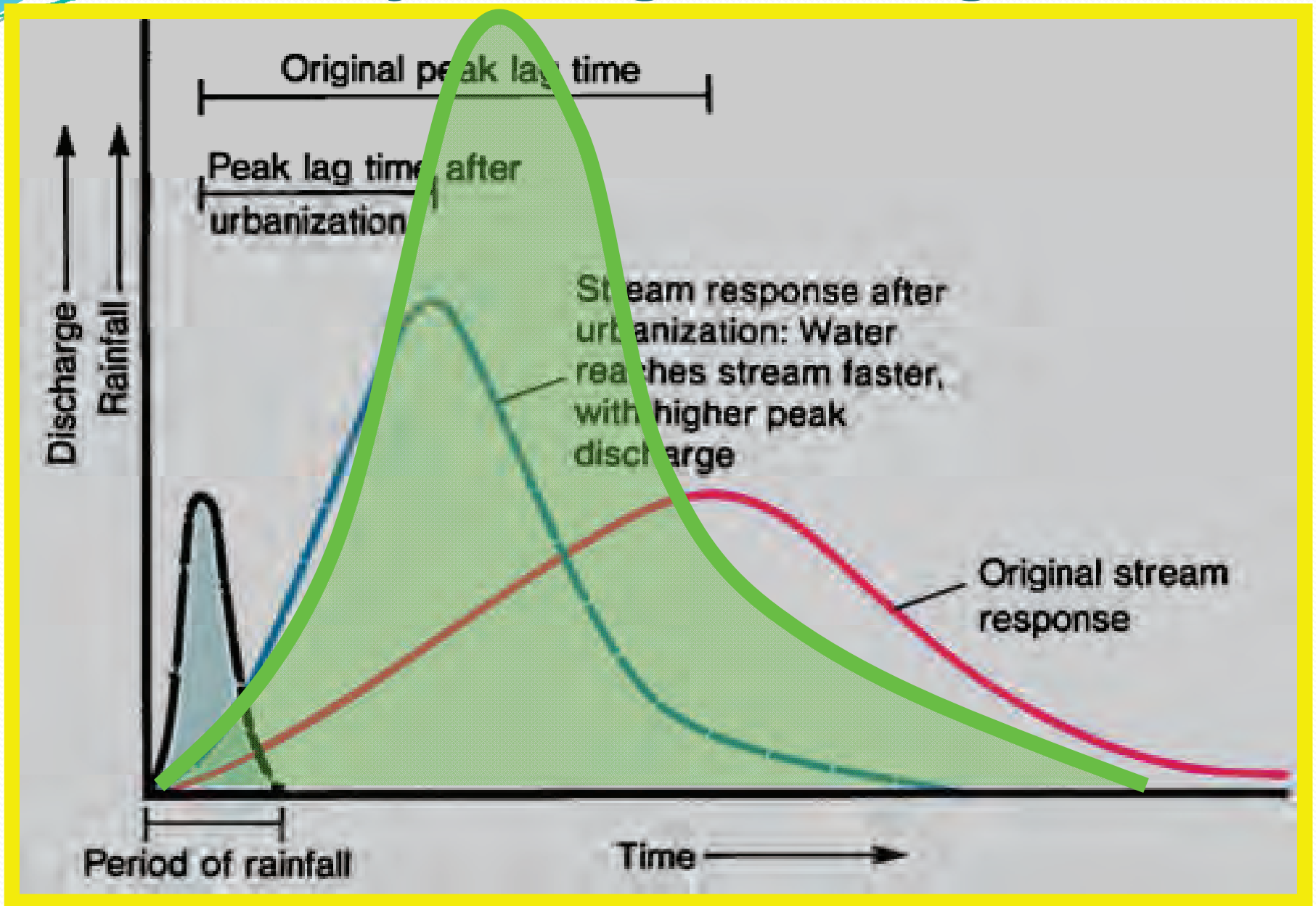
LID and Sustainability

- **Water supply and use**
 - **Complications due to water transfers, recycled water, code restrictions**
- **Reduced flooding potential**
- **Energy use**
- **Urban heat island reduction**
- **Community “livability”**

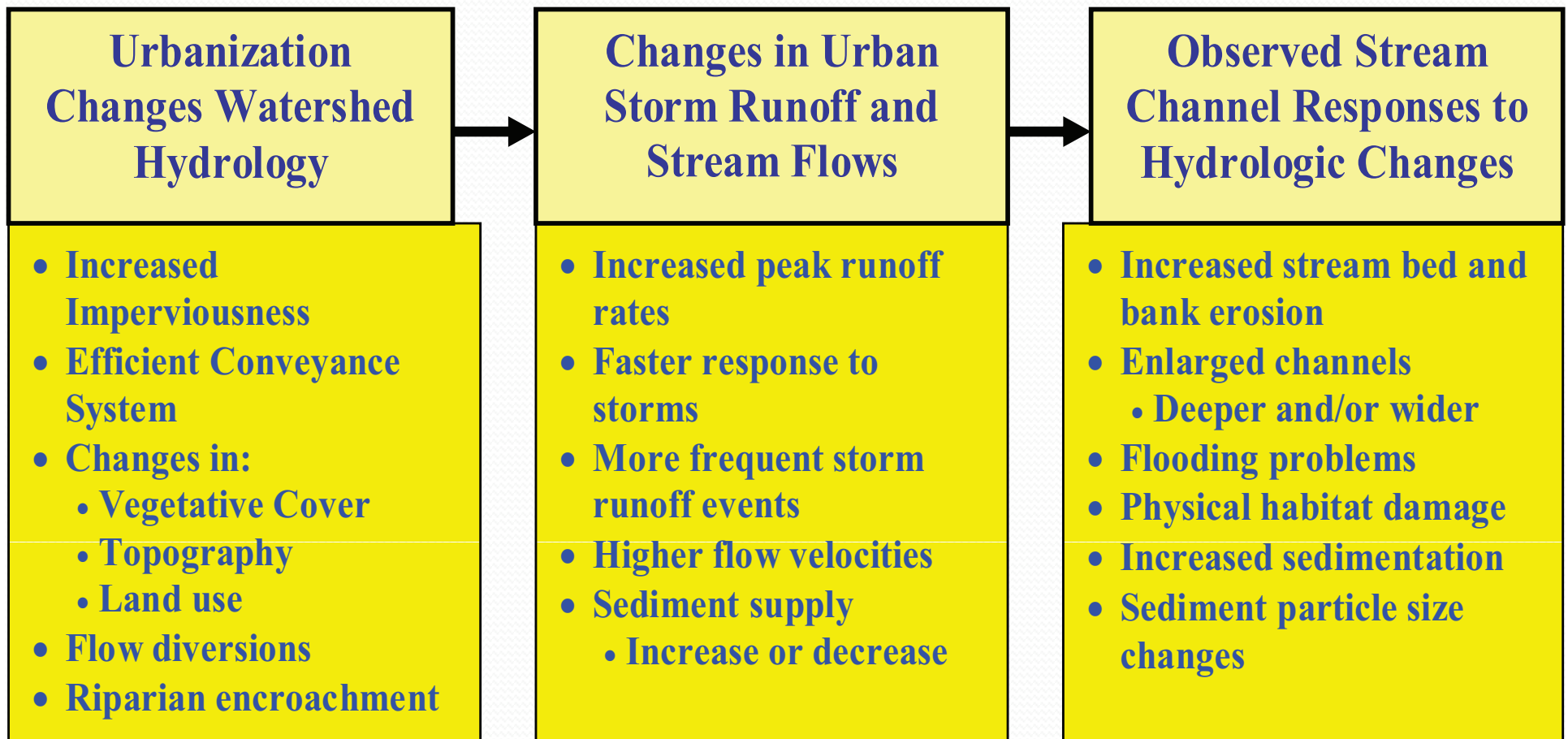
LID and Stormwater

- **Water Quality—pollutant removal**
- **Groundwater recharge**
- **Augment water supply—capture and use**
- **Reduced runoff volumes**
 - **Reduce impacts from hydromodification**

Hydrologic Changes



Changes and Impacts: Conventional Development



What is Hydromodification?

- **Urban-Related Hydromodification**

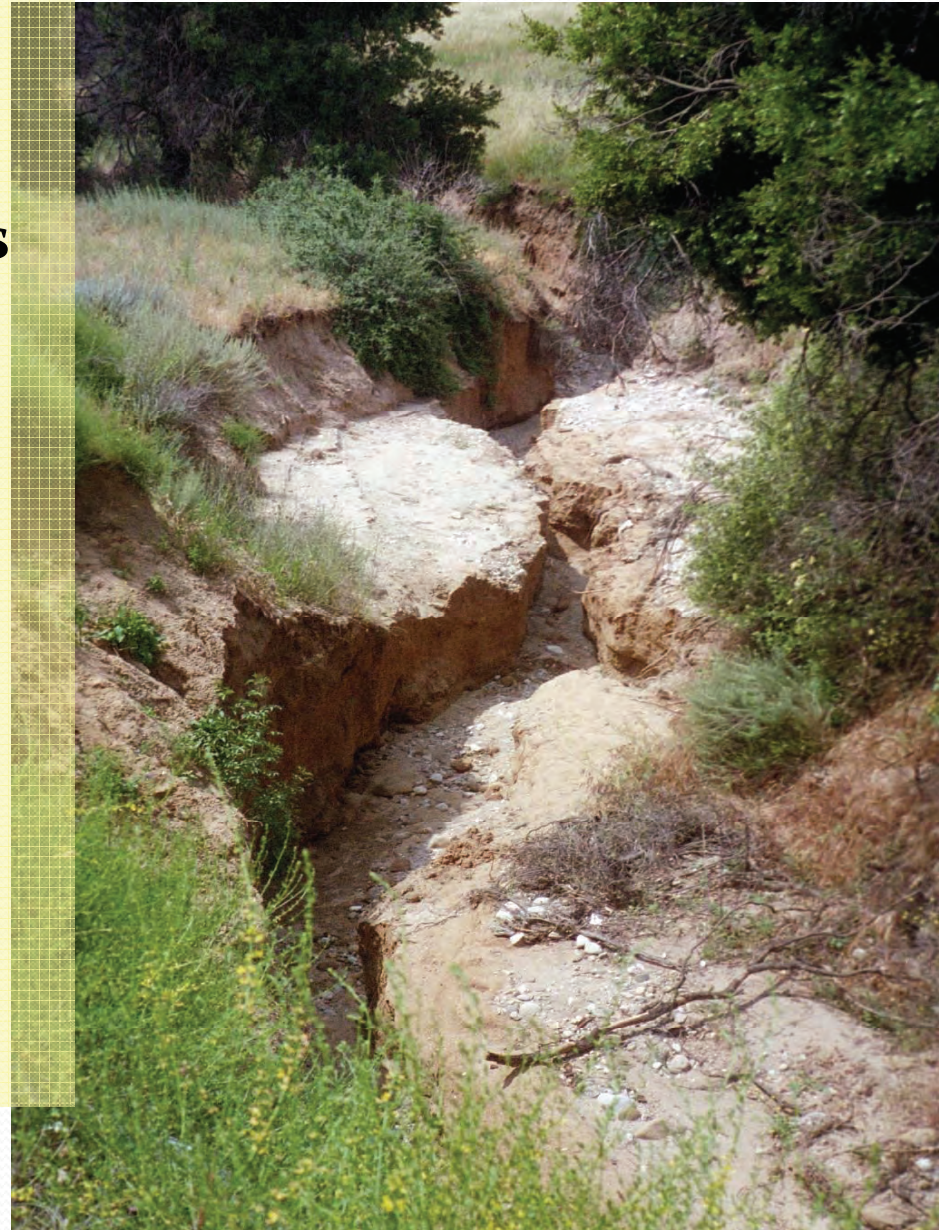
- Increased Imperviousness
- Changes in runoff volume and frequency
- Changes in sediment supply
- Direct channel changes

- **Hydromod Impacts**

- Increased Erosion
- Sedimentation Changes

Habitat Loss/degradation

Bio/ecological impacts



Benefits of LID

- **Reduces pollutant loads**
 - Reduces runoff volume
 - Reduces pollutant transport
 - Removes/transforms pollutants
- **Enhances water supplies**
 - Infiltration can recharge GW
 - Provides capture and reuse potential
- **Reduces impacts to downstream areas**
 - Less hydrologic alteration
 - Less stress on conveyance system

FAQs & Misconceptions

- **LID ≠ Smart Growth**
- **Smart Growth**
 - **Urban planning and transportation approach**
 - Reduce sprawl
 - Enhance sustainability
 - LID used to address water quality/conservation
- **LID v. Sprawl**
 - LID is adaptable to the site—doesn't necessarily demand additional land
 - LID encourages preservation of open space—not

FAQs & Misconceptions

- **Mosquito breeding habitat?**
 - 48 hour drain/infiltrate designs should prevent breeding habitat
- **LID v. Flood Control**
 - LID Reduces runoff volume
 - May require less flood flow capacity
- **Cost?**
 - Materials
 - Construction sequence and permitting
 - Long-term benefits difficult to quantify



Acronyms

Hippopotomonstrosesquipedaliophobia

- **BMP**
- **CWA**
- **LID**
- **CASQA**
- **SWRCB**
- **RWQCB**
- **MS₄**
- **NPDES**
- **SCCWRP**
- **SMC**
- **SUSMP**
- **WQMP**
- **TMDL**

Questions?

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Richard Basehart
“He Walked By Night”
1948

