

The Lungs of the City

Landscape Design for Air Quality

SUN-A03

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and EXPO
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Philadelphia

PANELISTS

Kurt Culbertson, FASLA | Design Workshop
James Stickley, ASLA, LEED AP | WRT
Brent Bucknum | Hyphae Design Laboratory

MODERATOR

Scott Shinton, Assoc. ASLA | Kounkuey Design initiative



statement

We have addressed stormwater quality, but what about air quality? Through this session, panelists will present research and built projects to show how to begin to approach this problem that negatively impacts the public health of the most disadvantaged populations in this country and worldwide through landscape design tactics.

learning objectives

1 | Historical Context

Unpack the historic conception of parks as the lungs of the city and inspire creative thinking about the next great challenge in landscape architecture: air quality.

2 | Defining the Problem

Explore how we define air quality in all its complexities: air temperature, humidity, pollen, particulates

3 | Gathering Data

Uncover site-specific data which supports the faith-based claim that parks are the lungs of the city.

4 | Adaptation Strategies

We take faith that trees clean the air—is this true? What data supports this claim? What about pollen and allergies? Begin to understand pollutants that can be addressed with plantings.

Historical Background (Kurt Culbertson)

- + History of the expression “parks are the lungs of the city.”
- + The expression was first attributed to William Pitt (1708-1778) the Earl of Chatham, by Lord Windham in a speech in the House of Commons on 30 June 1808, during a debate on encroachment of buildings upon Hyde Park
- + Olmsted famously stated later, in 1872, that “parks are the lungs of the city and the heart of the community.” We will interrogate how he anticipated the intense growth of metropolitan areas and recognized that human benefit would accrue from setting aside land to remain forever green. Parks would be ‘lungs’ for cities, where people could relax and breathe air that had been cleansed and refreshed by trees.
- + Crompton dissects the evolution of the term “parks as lungs” by describing the conditions which fostered the metaphor, explains its private and public good dimensions, traces its genesis and diffusion, including its transition from England to the US and concludes with an assessment of its potency in contemporary society.

Comparison of the profession’s interest of green stormwater infrastructure and relative lack of emphasis on air quality

The Health Impact of Air Quality

- + The Right to Breathe

Defining Air Quality

Trees as A Tool for Air Quality: The relationship between trees and air quality

- + What does the empirical data really show about the ability of trees to clean air?
- + Trees as a source of isoprene VOC emissions
- + What is the impact of air quality and acid rain on trees?
- + What does empirical data say about concrete, algae, activated charcoal to absorb pollution.

How is air quality monitored?

- + The challenge of data from air quality monitoring station for site specific design
- + Advances in “backpack/hand held” air quality monitoring devices. One in particular, an affordable handheld monitor being crowdsourced right now, will be released this fall.

Other Techniques

- + Channeling winds through land form, carbon sequestration machines, algae installations, carbon sequestering materials (charcoal, concrete, etc.), how soils absorb carbon

Examples of Projects specifically designed to address air quality:

South Grand

- + Heat Island Effect
- + Material Selection
- + Shading
- + Tree Canopy

Chengdu Riverfront Park

- + Beijing’s plan to clear buildings to open up air channels through the city
- + Landscape Guidance for Improvement Air Quality Near Roadways (Sacramento)

USDA Agroforestry Center Research on Air Quality Buffers

Session Outline

Addressing Air Quality as Part of a Broader Application of Ecosystem Services (James Stickley)

Microsoft Silicon Valley Campus Example (Mountain View, CA)

The broader eco-system service strategy

- + Water quality
- + Drought tolerance / water conservation
- + Air quality
- + Habitat
- + Soils
- + Pollinators
- + Food production
- + Heat island
- + Recreational
- + Social & spiritual

Specific responses to air quality

- + Understanding particulate loads and prevailing winds
- + Designing responses to mitigate air quality conditions
 - + Lines of defense
 - + Species selection
 - + Overcoming challenges of rooftop planting

Mariposa Park Example (San Francisco, CA)

- + Creating a neighborhood park in a constrained urban environment -- the broader ecological and cultural integration strategy
- + Specific responses to freeway adjacency – noise and air quality
 - + Combining topography and planting to amplify effectiveness

Measuring Air Quality and Health through Designed Experiments (Brent Bucknum)

Adapt Oakland

West Oakland Army Base

Urban Biofilter

University of Louisville clinical trial on road greening and health

- + 5-year study with cardiovascular researchers
- + Federal Highway funded pilot study on vegetated buffer adjacent to a school
- + Measuring blood and urine samples for near road vocs and immune cell responses
- + Discussion Q&A session with the audience (30 Minutes)

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