

Improving Health in Communities Near Highways

Northeast Sustainable Energy Association

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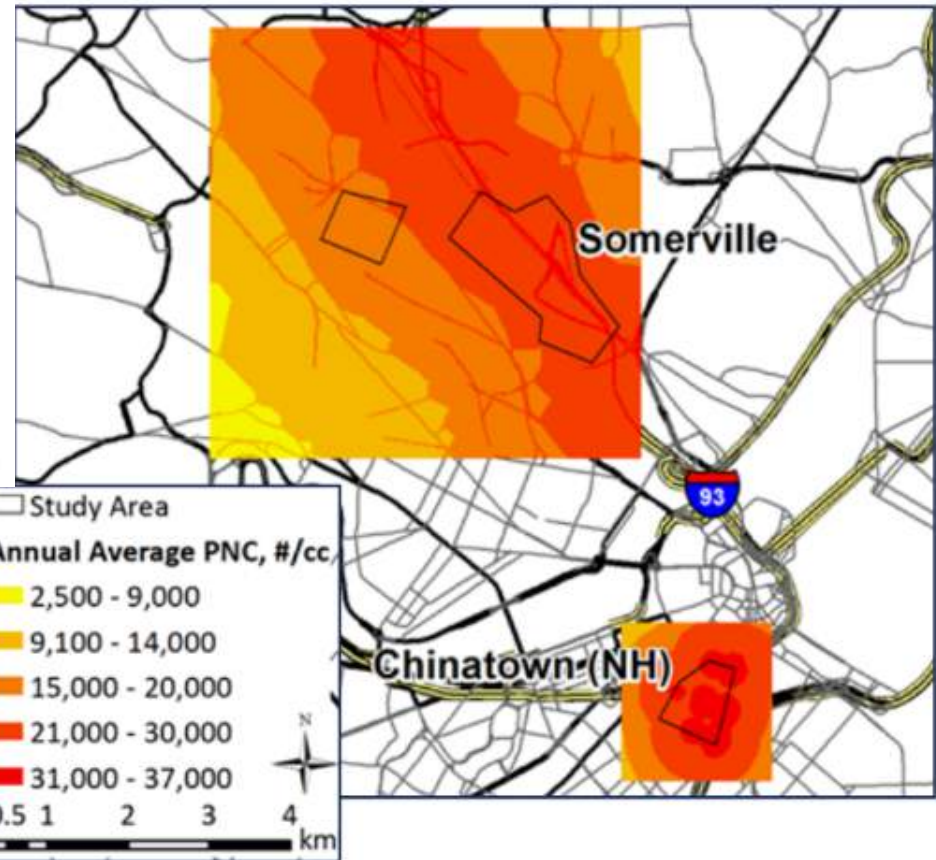


POLLUTION CONCENTRATION

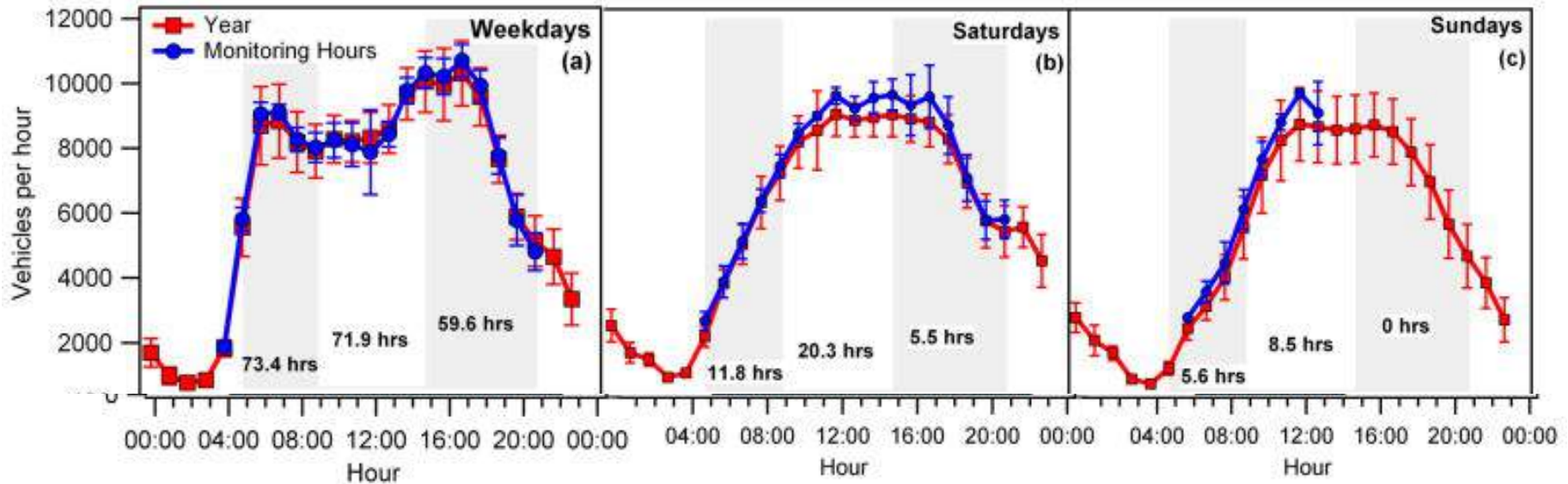
Point-Based Results



Normalized Results



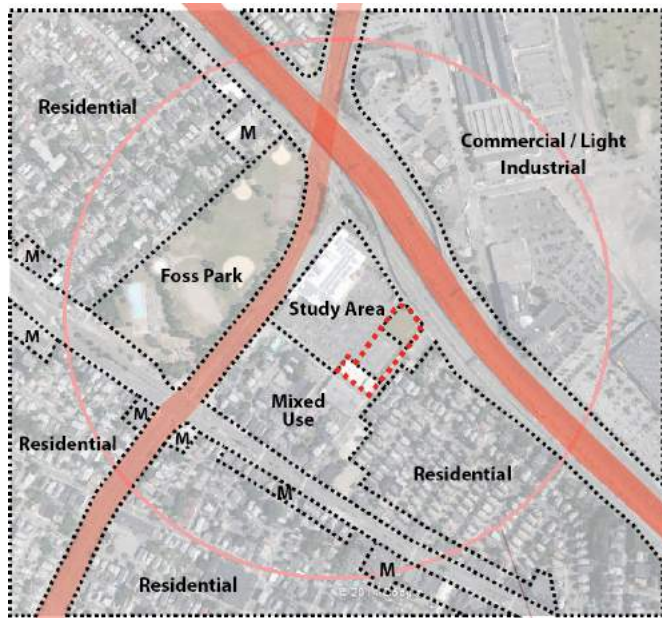
PREDICTABLE, YET DYNAMIC



- Pollution concentration varies daily and weekly
- Highest pollution concentration at rush hour

HOW DOES THIS APPLY TO MY PROJECT?

- Conduct a site analysis to determine the main sources of pollution
- Consider solutions that can protect the most people



A PATH FORWARD

Kresge Project research support and implementation has focused on:

**Working
with
Developers**

**Municipal
Regulation**

Legislation

ACTIONS & ADVOCACY

Working with Developers

- Moving housing and parks outside of buffer zones,
- Installing more effective filtration,
- Placement of outside air intake grills.



ACTIONS & ADVOCACY

City of Somerville

- Potential addition to updated city-wide zoning aimed at reducing occupant exposure to vehicle-generated pollution.
- Setting performance goals for buildings inside buffer zones,
- Defining testing protocol for compliance.

ACTIONS & ADVOCACY

Proposed Healthy Breathing Act

- Considers fine and ultra-fine particulate,
- Requires siting of publicly funded residential or sensitive buildings outside of defined buffer zones,
- And/or mitigation and testing.



POLLUTION MITIGATION TACTICS

Improving Health in Communities Near Highways

Design Solutions from a Charrette

Prepared by the
Community Assessment of Freeway Exposure and Health
(CAFEH)

Participants in the Charrette:

David Arond	Michael Gimieres	George Proakis
Brad Bellows	John Gravelin	Denise Provost
Alex Bob	Sherry Hon	Ellin Reisner
Jeremy Bowman	Peter James	Matt Simon
Dung Brugge	Sae Kim	Josh Safdie
Richard Chang	Jon Levy	David Spillane
Damon Chaplin	Dana Lewinter	Dec Spiru
Lawrence Cheng	Chin Lin	Noemie Sportiche
Meera Deean	Angie Liu	Anne Tate
Martine Dion	Lydia Lowe	Terry Yin
John Durant	Yi Qi Lu	Wig Zamore
Shauna Gillies-Smith	Jim Newman	Felix Zemel
	Allison Patton	

This report was made possible by support from The Kresge Foundation

THE KRESGE FOUNDATION

Report compiled national research and categorized solutions

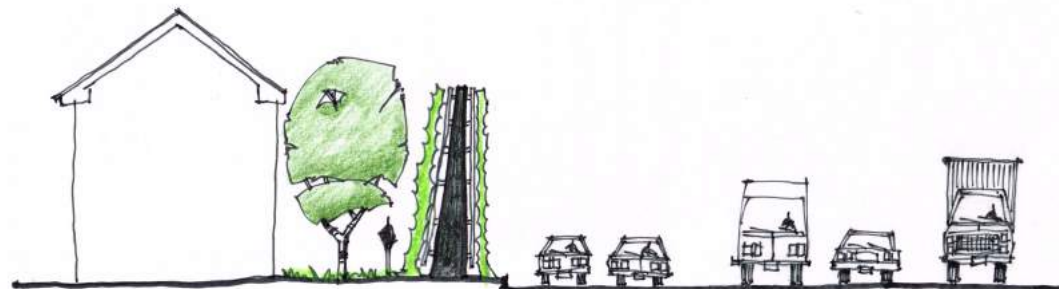
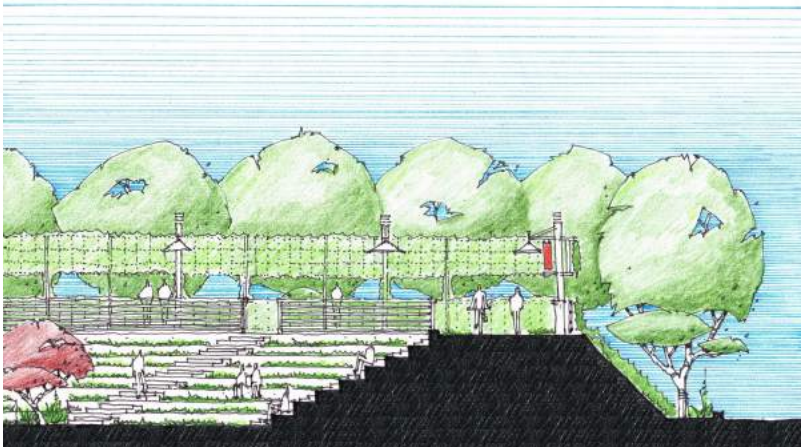
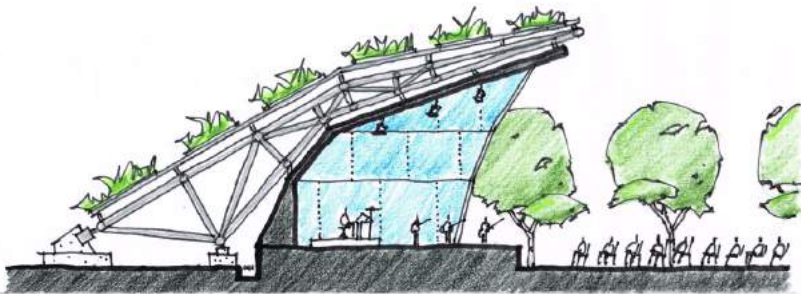
Solutions reduce exposure from 10-80%

Why do these solutions matter?

- Reduces exposure
- Reduces health risk

VEGETATIVE / BUILT WALL BARRIERS

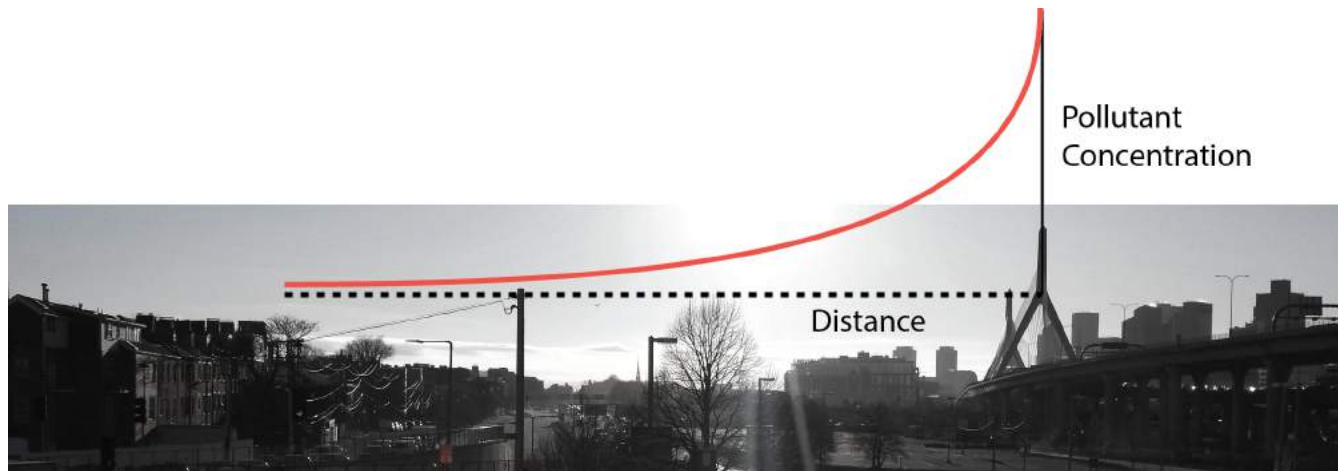
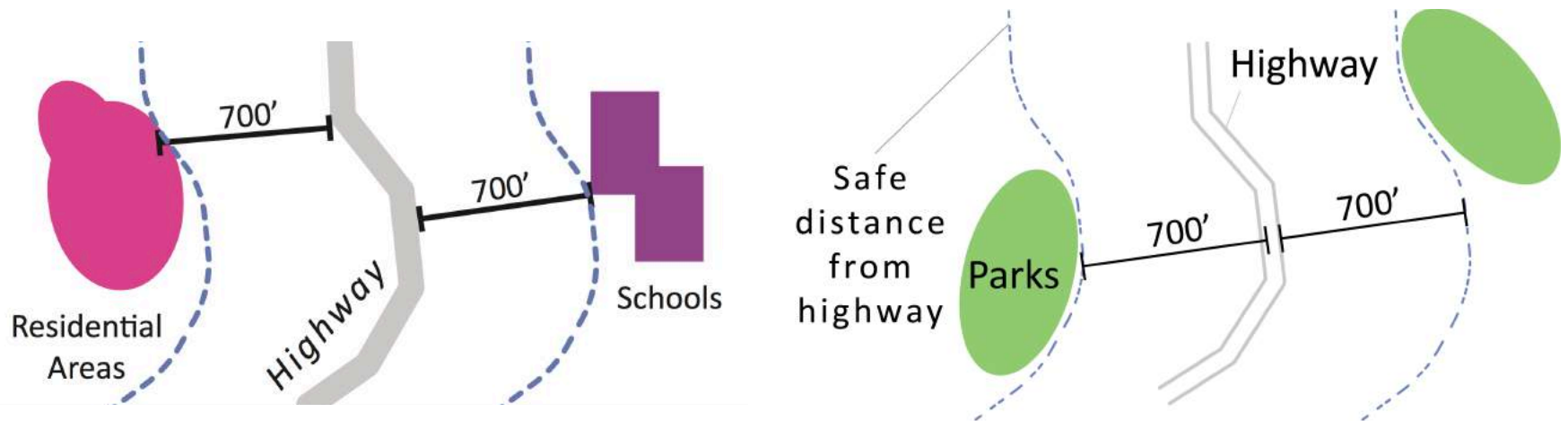
Pollution Reduction Potential:
10-50%



LAND USE BUFFERS

Pollution Reduction Potential:

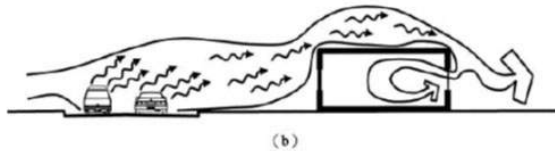
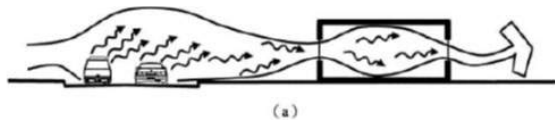
40%



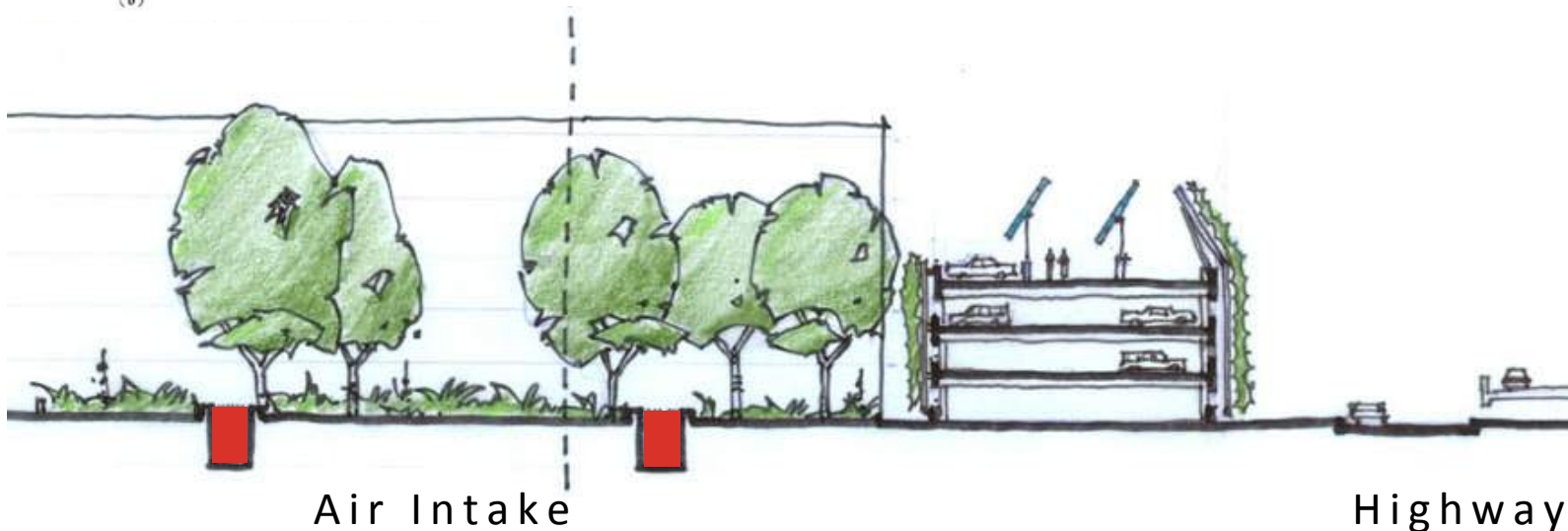
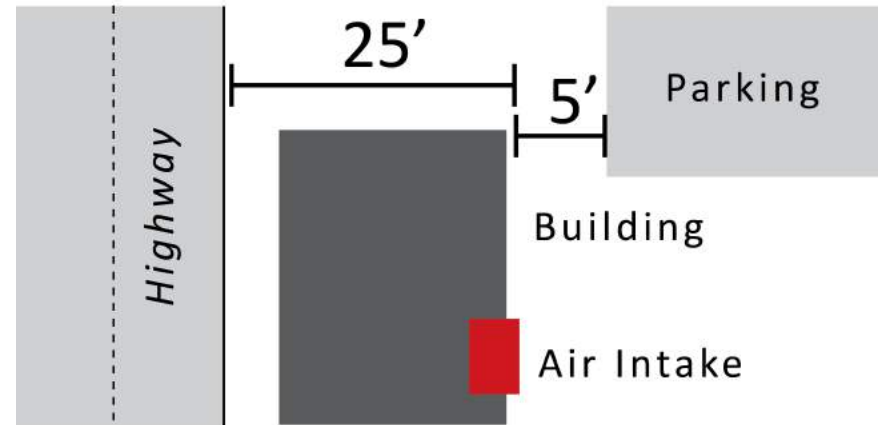
AIR INLET LOCATIONS

Pollution Reduction Potential:

50%



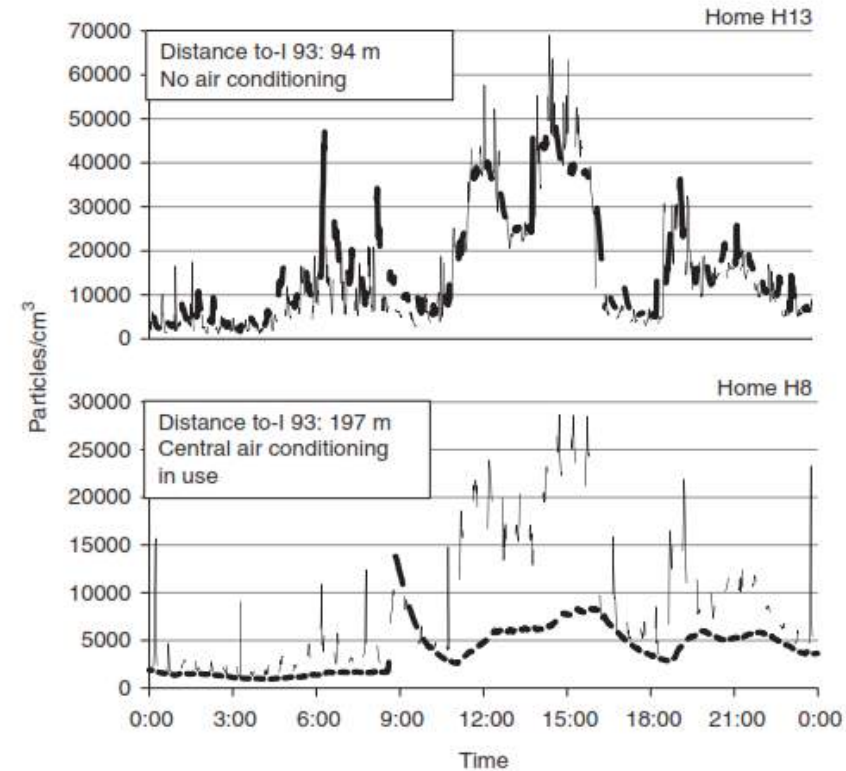
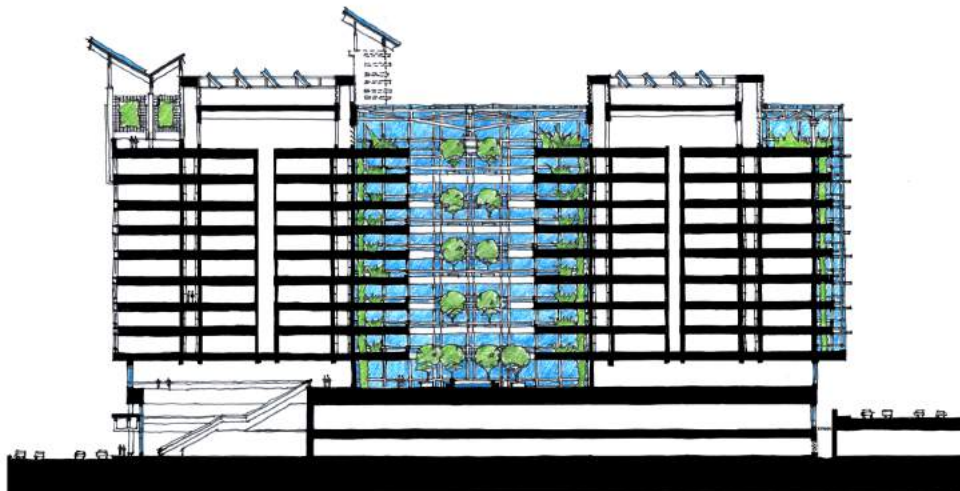
ASHRAE 62.1-2013
Minimum Distances



FILTRATION

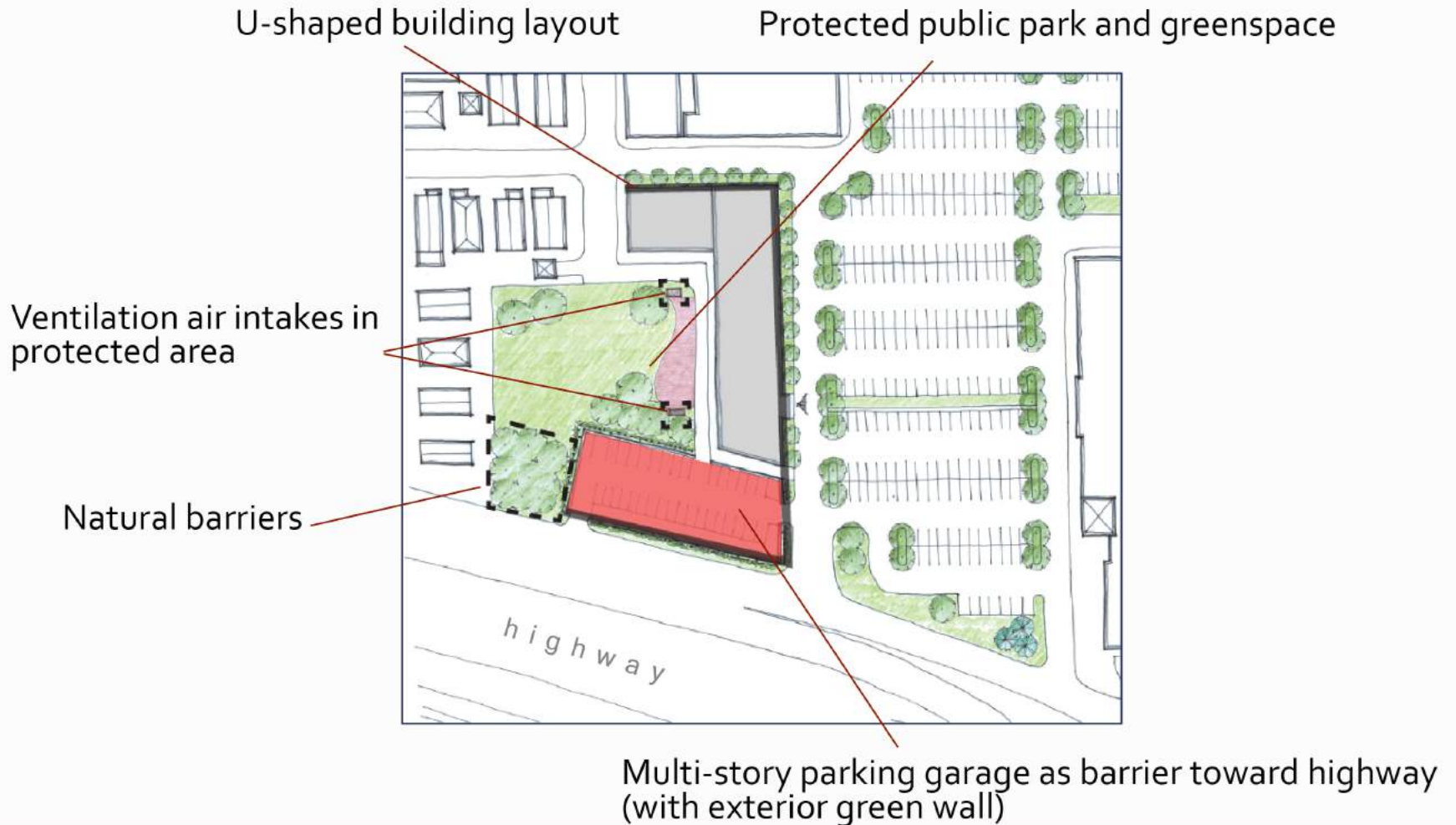
Pollution Reduction Potential:

10-80% (depending on MERV Filters 4-16)



COMBINED SOLUTIONS

Example Diagram from the Design Charrette



GLUMAC SHANGHAI OFFICE

- Health Petal Goal: Maintain indoor air quality in a city that reports harmful air pollution levels
- At times, PM2.5 is measured at 250 ug/m³
- (WELL Building standard must be below 15 ug/m³)
- Building employs 3 stage filtration system to achieve 50 ug/m³
 - 1: MERV 8 filter
 - 2: Electrostatic
 - 3: MERV 15 filter

Source:

<http://www.glumac.com/announcements/2-new-steps-for-sustainability-glumac-brings-the-living-building-challenge-to-asia-and-our-shanghai>



Key Questions

- What does the best possible filtration system look like?
- How can we increase filtration of air while reducing energy demand?
- How can we deal with operable windows and interior pollution sources?

