

**From:** [Diana W](#)  
**To:** [Urban Design Comments](#)  
**Subject:** Public Comment: 5534 Medical Circle & 5555 Odana Road (UDC Meeting - April 29, 2026)  
**Date:** Wednesday, April 29, 2026 2:58:06 PM

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To the Members of the Urban Design Commission,

My name is Diana Weng, and I am a parent and board member at Montessori Children's House (MCH), located at 5530 Medical Circle. I am writing to submit public comments regarding the proposed development at 5534 Medical Circle and 5555 Odana Road.

While the project includes a landscaping plan, I am concerned that the current proposal for the northern and western borders of our school site is insufficient as a functional environmental buffer. For a school where children are outdoors year-round, landscaping must be viewed as critical infrastructure for mitigating construction dust, noise, and ongoing air pollution.

I would like to request that the Commission consider the following technical points and incorporate them as conditions for approval:

**1. Year-Round Air Filtration (Species Substitution)** The current plan relies heavily on London plane trees. While these are effective at sequestering particulate matter when in leaf, they are deciduous and provide no protection for nearly half the year. I urge the Commission to require the inclusion of hardy, salt-tolerant conifers—such as **Norway Spruce** or **Eastern White Pine**—along the southern and eastern property lines of the development. These evergreens provide a dense, multi-layered "green curtain" that filters pollutants 365 days a year.

**2. Mitigation of the "Tunneling Effect"** A scattered or sparse line of trees can create a "tunneling effect," where wind and pollutants are funneled through gaps at higher velocities. To effectively protect the playground, the buffer must be continuous and multi-tiered, incorporating a dense evergreen base with a tall canopy to ensure ground-level particulates are captured.

**3. Soil Health and Viability** The developer's notes acknowledge a "lack of sun" in these specific buffer zones and the reality of significant soil compaction from heavy machinery. Without specific requirements for **structural soil cells or deep soil remediation**, new plantings are unlikely to survive the adverse conditions. We request a certified soil management plan to guarantee these trees thrive and provide the promised environmental benefits.

**4. Installation Timing** The most intensive phases of excavation and diesel-heavy site work happen at the beginning of construction. We ask for a phased planting approach where these perimeter buffers are established **before** major site work begins, rather than as a final aesthetic touch at the end of the project.

Our students deserve a design that prioritizes their long-term health and air quality. We ask that the Commission hold this project to a high standard regarding its environmental impact on

its youngest neighbors.

Thank you for your time and consideration.

Sincerely,

Diana Weng

Parent and Board Member

Montessori Children's House

I would like to bring attention to a site-specific concern related to the buildings' design and massing, the location of this project in relation to a major highway, and a vulnerable population of children whose health may be directly impacted.

In particular, I want to emphasize an issue often overlooked in urban design discussions: the role that building configuration and design plays in concentrating and trapping air pollution. When located along major roadways, the built environment can either disperse pollution – or intensify it.

In this proposal, the buildings' massing and height stands to create an urban canyon effect, where pollutants are more likely to accumulate at ground-level, rather than disperse. Pollutant concentrations in these entrapment zones can be several times higher than ambient readings and easily reach unsafe levels. Young preschool children are especially vulnerable to the adverse health effects of air pollution exposure.

In light of these increasingly recognized concerns, there is a growing body of literature exploring the impact of urban design on ground-level air pollution entrapment. Design mitigation strategies frequently include:

- breaking up building massing
- using a pitched roof design
- considering the impact of balconies on wind recirculation effects
- reducing building height
- using step-up building designs
- and increasing building setback to widen the width of the canyon.

None of these mitigating features are embodied in the current design plan.

While vegetative barriers, such as evergreen hedges may provide some localized reduction in particulate exposure, it cannot fully compensate for poor airflow conditions created by building geometry.

Nonetheless, research findings generally support that green walls can help absorb particulates within an urban canyon, while strategically installing

dense evergreen hedges (such as red cedars) can be useful as filtering buffers. When discussing outstanding items, I urge this commission to not only consider aesthetics, but also how building and landscape design meaningfully impacts airflow. How can we use landscaping at the site boundary to at least partially absorb these anticipated harmful pollutant effects? Given that the new plan increases the impermeability ratio of the property significantly, how can we maintain or compensate for the lost green space that previously absorbed air pollutants?

Below is an example of aesthetically pleasing semi-pervious metal privacy wall that could be installed between the sites that would still promote airflow. A living hedge of evergreens planted on the preschool side may function to absorb particulate matter. Adding taller trees on the development side of the fence could be advantageous in mitigating downstream recirculation effects.



April 29, 2026

**City of Madison Urban Design Commission**  
**Re: Final Approval — 5555 Odana Road & 5534 Medical Circle, File #89886**

Dear Members of the Urban Design Commission,

My name is Margaret Porco. I am writing again as the President of the Board of Directors of Montessori Children's House (MCH), located at 5530 Medical Circle — immediately adjacent to the proposed development on two sides. MCH has served Madison's families for over 60 years as a licensed early childhood education facility for children ages 18 months to 6 years.

I understand that the Commission's review today is scoped to the conditions imposed at the time of initial approval in February 2026. The landscaping condition is the subject of these comments. I have reviewed the revised landscape plans submitted by the applicant and while I acknowledge that revisions have been made, I do not believe the submitted plan fulfills the purpose of that condition. Further, as explained below, the landscaping condition carries direct implications for air quality and the health of young children who are required by state licensing to spend time outdoors each day, immediately adjacent to this site. Therefore, I ask the Commission to require meaningful changes before granting final approval

**February 18, 2026 Landscaping Approval Condition**

At its February 18, 2026 meeting, the Urban Design Commission granted conditional approval of this project. Two of the six conditions are directly before the Commission today:

- Landscaping: "The applicant shall revise the landscape plan to incorporate additional landscape islands along the east elevation of Building A and southern property line shared with the school, including considering full size trees, additional tree islands, reducing parking, etc."

The Commission specifically named "the southern property line shared with the school" as the area requiring landscaping attention. I ask the Commission to evaluate whether the landscape plan submitted for final approval actually fulfills that intent — not merely whether it constitutes a revision.

**The Air Quality Concern: Canyon Effect and the Beltline**

The proposed development creates a specific and foreseeable air quality risk that has not been adequately studied or addressed at any stage of this review process. The site sits directly across from the Beltline (U.S. Highway 12/14/18), the City's primary urban freeway and one of the highest-traffic corridors in the Madison metropolitan area. The Beltline is a continuous source of diesel particulate matter, nitrogen oxides (NOx), and

fine particulate matter (PM2.5). Research consistently shows that ambient pollutant levels are measurably elevated within 300–500 meters of high-volume highways — and this site is well within that zone.

The proposed building configuration — a six-story building along Odana Road and a five-story building along Medical Circle, positioned in close formation around the MCH site — creates the physical geometry for a “canyon effect” or pollution pocket. When tall buildings flank a relatively narrow open corridor near a major roadway, they impede the natural vertical dispersion of air pollutants. Rather than rising and dispersing, vehicle emissions become trapped in vortices within the corridor, recirculating and concentrating at ground level — precisely where young children play and breathe.

Victoria Williams, PhD — a faculty member at the University of Wisconsin-Madison with published peer-reviewed research on air pollution and adverse health outcomes — raised this concern in testimony at both the Urban Design Commission and Plan Commission meetings, and in written comments to the Common Council. Dr. Williams cited research demonstrating that the building permeability, height, and setback characteristics of this project are precisely those associated with elevated pollutant trapping in isolated urban canyons. No air quality study, dispersion modeling, or canyon-effect analysis has been submitted as part of this application. None was required.

Research on roadside vegetation barriers — including studies conducted specifically at school playgrounds adjacent to high-traffic corridors — demonstrates that a continuous evergreen planting along a shared boundary can reduce particulate matter concentrations on the playground side by between 13% and nearly 50%, with the most effective configurations reducing ultrafine particle concentrations by more than 74%. These are not marginal gains — they represent meaningful protection for children whose lungs are still developing and who are required by their state licensing to be outdoors daily.

MCH has appealed the Plan Commission’s conditional use approval to the Common Council on the grounds that no air quality analysis was required or conducted. That appeal is pending. I am not asking this Commission to re-litigate those issues today. But I am asking the Commission to recognize that the landscaping condition before it is, at this moment, the primary available mechanism to provide some measure of protection between a documented and foreseeable pollution risk and the children most directly exposed to it. Though we are continuing to reach out and attempt to work with the developer in good faith, the developer has not made any commitment to support our requests and has not been able to find time to meet and discuss these things with us. So we are asking the city for support.

### **The Landscaping Condition: Four Deciduous Islands Are Not Sufficient**

The applicant’s revised submittal responds to the landscaping condition with four landscape islands along the shared boundary — two along the east elevation of Building A and two along the southern property line shared with MCH — each

containing an Exclamation London Plane Tree (*Platanus x acerifolia* 'Morton Circle'). Four isolated islands. Four deciduous trees.

I do not believe this fulfills the purpose of the condition, for two reasons:

- London Plane Trees are deciduous. They are bare from fall through early spring — precisely the seasons when children are still outdoors and when vehicle-related pollution concentrations tend to be highest. A buffer that provides no interception for five or six months of the year is not a meaningful pollution buffer for this school.
- Four isolated landscape islands are not a continuous buffer. The condition called for landscaping “along the southern property line shared with the school” — language implying coverage along the boundary, not four discrete planting pockets separated by open asphalt. Gaps between isolated specimens allow ground-level pollutants to flow through unimpeded. Continuity is essential to the function.

I ask the Commission to require a two-part landscaping response that addresses both sides of the boundary line and provides layered, year-round protection. The Commission has greater expertise than I do in specifying appropriate species, and I defer to that expertise on the particulars. What I ask for is that the design principle be established: the plantings must function as a continuous pollution barrier, not merely as isolated ornamental specimens.

#### **On the development side of the shared boundary:**

**I ask the Commission to require a continuous row of evergreen trees planted along the full length of the lot line shared with MCH, on the applicant's property. The species selected should be of a type that provides both significant height at maturity and meaningful year-round pollution interception** — the kinds of dense, fine-needled or scale-leaved evergreens, such as cedar and arborvitae varieties, that research has identified as particularly effective at capturing fine particulate matter due to their leaf surface characteristics, and that retain that function in all seasons. The Commission is better positioned to specify which particular cultivars are most appropriate for this site, context, and climate. What is essential is that the planting be continuous — a row, not isolated islands — and evergreen, not deciduous.

#### **On the MCH side of the shared boundary — the easement area:**

On the other side of the fence, our side of the boundary, I would ask to plant a complementary layered buffer in the easement area — a mixed planting of taller evergreen trees and shorter understory trees and hedges that would further reduce pollutant infiltration into the playground zone. Research on layered vegetation barriers demonstrates that a combination of canopy-height trees and lower shrub or hedge plantings provides substantially greater pollution reduction than a single-height planting alone, because it intercepts emissions at multiple levels. This two-sided approach — a

continuous evergreen row on the development side, a layered mixed buffer on the MCH side — would represent a genuinely effective mitigation strategy rather than a nominal design gesture.

I ask the Commission to condition final approval on a revised landscape plan that reflects this framework, and to require a five-year maintenance and replacement obligation for the plantings along the shared boundary so that the protective function is durable over time.

### **The Larger Point: Mitigation in the Absence of Study**

I want to be direct with this Commission about where things stand. MCH has raised the canyon-effect air quality concern throughout the process. No dispersion study has been required. No findings have been made. The developer has not made any commitments, and has not been willing to meet with us. The Plan Commission approval is under appeal to the Common Council, but that proceeding has its own timeline and outcome is uncertain.

If the city is not yet willing to require the study, and the developer is not willing to discuss and/or commit to making changes, the landscaping condition before this Commission today is the most immediate and concrete opportunity available to put some measure of real protection between a foreseeable pollution risk and a playground full of toddlers. I am asking only that the condition be fulfilled in a way that actually functions — a continuous evergreen row on the lot line and a layered mixed buffer in the easement. I believe these are reasonable, implementable, and scientifically supported requests. They are also the minimum that children playing in a canyon corridor adjacent to one of Madison's busiest freeways deserve.

The children at Montessori Children's House cannot wait for a future proceeding to resolve what should be determined at the fence line and the tree line today.

### **Summary of Requests**

I ask the Commission to require the following landscape revisions before granting final approval:

- Landscaping — Development side: Require a continuous row of evergreen trees (cedar, arborvitae, or comparable varieties of appropriate height and density) along the full length of the lot line shared with MCH and Building A on Odana Road, on the applicant's property. The planting must be continuous, not isolated islands, and must be evergreen to provide year-round pollution interception. The Commission's expertise in selecting appropriate species for this site and context is welcomed.
- Landscaping — MCH easement side: Encourage and facilitate a complementary layered buffer planting in the easement area on the MCH side of the fence line, incorporating a mix of taller evergreen trees and shorter understory trees and

hedges, to further reduce pollutant infiltration into the playground zone from multiple height levels.

- Maintenance: Require a five-year maintenance and replacement obligation for all plantings along the shared boundary, ensuring the protective function is durable and not merely nominal at installation.
- Review: Provide MCH the opportunity to review any revised landscape plan before final approval is granted.

Respectfully submitted,

**Margaret Porco**

Board President, Montessori Children's House  
5530 Medical Circle, Madison, WI

**Common Council Meeting: 03/24/2026**

**Comment on Item 91514: Development at 5555 Odana Rd / 5534 Medical Circle Dr**

Dear members of the Common Council,

I recognize that the Conditional Use Permit (CUP) for this project has already been approved by the Plan Commission on 03/16/26 and that the Council's role at this stage may be limited. However, I am submitting this comment to ensure that my ongoing concerns are part of the record. In this testimony, I raise concern as to whether the required finding for CUP approval – that the project will not be detrimental to public health - has been fully supported by site-specific evidence. **I want to emphasize that this is not a general objection to development at this site, but rather site-specific concerns considering the site's location, proposed design and massing of the buildings, and the vulnerable population of preschool children whose health may be impacted by this development.**

The location of this specific development is located immediately adjacent to a preschool and in close proximity to the Beltline, a major source of traffic-related air pollution. Young children are particularly susceptible to these pollutants due to their higher respiratory rates and developing lungs. Adverse health outcomes from traffic-related pollution exposures in children has been strongly supported in the medical literature. **A recently published review in this area reports that exposure to air pollutants during sensitive early childhood developmental periods is associated with heightened risk for respiratory disorders, neurodevelopmental impairment, and chronic conditions including cardiovascular disease**<sup>1</sup>. Accordingly, the World Health Organization has recently lowered its health-related limit values for particulate matter (PM<sub>2.5</sub>) and nitrogen dioxide (NO<sub>2</sub>), both of which are tied to vehicular emissions, to reflect these known harmful effects of air pollution on human health<sup>2</sup>. In my research as faculty at UW Madison, I have previously published on how air pollution exposure is associated with increased risk for dementia in another vulnerable population, older adults<sup>3</sup>. However, the mechanisms by which harmful air pollution exposure impacts the body are universal across these sensitive populations,

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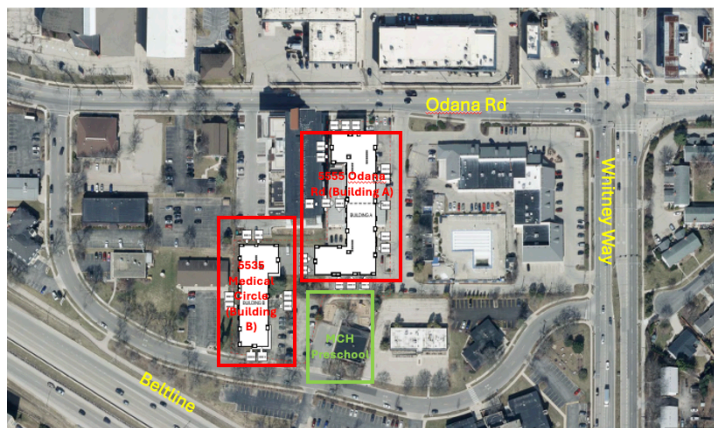
<sup>1</sup> Chong-Neto, H. J., & Rosário Filho, N. A. (2025). How does air quality affect the health of children and adolescents?. *Jornal de Pediatria*, 101, S77-S83.

<sup>2</sup> World Health Organization . World Health Organization; Geneva: 2023. Climate Change and Noncommunicable diseases: Connections.<https://www.who.int/news/item/02-11-2023-climate-change-and-noncommunicable-diseases-connections>

<sup>3</sup> Williams, V. J., Trane, R., Sicinski, K., Herd, P., Engelman, M., & Asthana, S. (2024). Midlife and late-life environmental exposures on dementia risk in the Wisconsin Longitudinal Study: The modifying effects of ApoE. *Alzheimer's & Dementia*, 20(12), 8263-8278

where aside from direct impacts to the respiratory system, other body organs (including the brain) are indirectly impacted by elevated pollution-associated systemic inflammation.

At issue with this particular development is how the approved building design may limit air movement and the dispersion of nearby traffic-related air pollution in a way that would concentrate these pollutants at ground level at the preschool. The building's massing and increased height (which required approval through a Conditional Use Permit) creates a nearly continuous wall of development that largely envelops the north and east boundaries of the preschool (shown below). Although the back of Building A is currently zoned at 5 stories, with the CUP allowance of 6 and accounting for elevation change, will stand at least 7 stories within 100 feet of the preschool playground. With the orientation of the beltline to the South, **this creates a strong potential for a canyon or barrier effect, where the air circulation is constrained and pollutants are more likely to accumulate rather than dissipate**<sup>4</sup>. Of notable relevance, the prevailing winds generally come from the South/Southwest in summer months when children at this preschool spend a large portion of their day playing outside. Whitney Way and Odana Rd also carry a high traffic volume, and the proximal placement of driveways and internal circulation routes bordering the preschool boundary, both likely confound these exposure effects as well. Given the known health risks associated with air pollution, there is a substantial scientific literature that has evaluated the impact of urban design configurations on ground-level air pollution exposures. A particularly relevant finding is that **increasing building permeability, limiting height, and increasing setbacks were found to be the most effective solutions to mitigating air pollutant exposure problems in isolated urban canyons**<sup>5</sup> – which are precisely the problems with this development.



<sup>4</sup> Fu, X., Liu, J., Ban-Weiss, G. A., Zhang, J., Huang, X., Ouyang, B., ... & Tao, S. (2017). Effects of canyon geometry on the distribution of traffic-related air pollution in a large urban area: Implications of a multi-canyon air pollution dispersion model. *Atmospheric Environment*, 165, 111-121.

<sup>5</sup> Ng, W. Y., & Chau, C. K. (2014). A modeling investigation of the impact of street and building configurations on personal air pollutant exposure in isolated deep urban canyons. *Science of the Total Environment*, 468, 429-448.

**These specific circumstances of this development compound to increase the need for due diligence to ensure public health and safety.** This is not a general planning concern; it is in response to the potential for site-specific harm. This is a unique situation where there is a direct problematic intersection between the massing and enveloping layout of the proposed developments and its proximity to the freeway where air quality concerns are greatest. When combined, these factors importantly compromise the health of preschool children (as young as 18 months), whom by state licensing requirements must spend time outside each day. Together, these facts **elevate the concerns above typical zoning considerations into substantive health and safety risks.** This combination is also not a typical condition, where the "comparable developments" or precedents that were raised in the Plan Commission are applicable. Instead, **the presence of these risk factors warrants a site-specific evaluation rather than reliance on general assumptions about the development's impacts on air quality.**

Under Madison's ordinance, the Council must be able to make specific findings that the project will a) not be detrimental to public health, safety, or welfare, b) is compatible with surrounding area, and c) will not create substantial adverse impacts. Without the city evaluating how the buildings' height and massing would affect pollutant concentrations at a preschool boundary, it is difficult to conclude that the project will not be detrimental to public health or welfare. **The very modification being granted through the Conditional Use Permit (additional height) is directly related to the potential for increased pollution concentration at a location that serves a vulnerable population (children).** The absence of analysis regarding the effects of this development on near-roadway air pollution exposure in the context of increased building height and massing adjacent to a sensitive use, raises questions about whether that finding was fully supported. Further, the expectation that this development will be publicly funded and subsidized should create a higher expectation of due diligence to ensure that health and safety standards are met.

Overall, I want to clearly reiterate that this constitutes a site-specific issue involving the intersection of design, location, and a vulnerable population. Addressing it doesn't require opposing development or sidelining this project, but it does **require ensuring that public health considerations are meaningfully integrated into the final design.** I respectfully defer to the Common Council what strategy should be pursued to ensure that this new development is not adversely impacting the health of our children; whether this proposal needs to be sent back to the Urban Design or Plan Commission(s) or can be addressed and mitigated during future planning stages. However, I strongly urge the Council to acknowledge this potential harm in the record and ensure that the necessary steps, including a site-specific air dispersion modeling study, be completed in order to reach an informed decision that this development does not pose a risk to the health of a sensitive

population. If adverse impact is indicated, I encourage the applicant to incorporate reasonable mitigation measures, such as:

- Stepping down building height and/or increasing setback of Building A along the boundaries adjacent to the preschool
- Adjust building placement or design to improve airflow and pollutant dispersion
- Relocating or minimizing vehicle activity near the preschool boundary
- Incorporating vegetative or structural buffering to aide in pollutant dispersion
- Implementing enhanced filtration and air quality protections

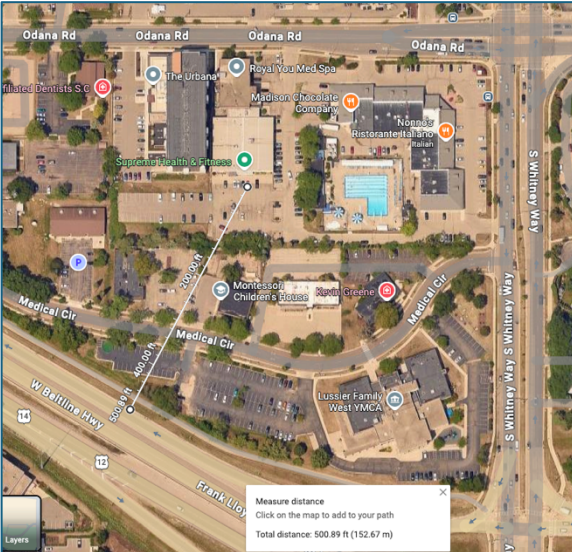
Thank you for your time. I would greatly appreciate any guidance, recommendations, or next steps your office could provide regarding this matter. I have yet to receive a direct response to this foreseeable concern that I have now raised through public and written comments at the Urban Design and Plan Commission meetings, and in direct email correspondence to the Common Council. I would welcome the opportunity to discuss this concern further.

Sincerely,

Victoria Williams, PhD

## Summary of Precedent and Planning Practice: Air Pollution, Building Design, and Sensitive Receptors

Planning and environmental review practice consistently recognize that **building height, massing, and configuration can significantly influence air pollution exposure**, particularly in areas near major roadways. Where these factors intersect with **sensitive populations such as children**, it is standard practice to require **site-specific analysis and, where necessary, design modification** prior to approval.



**Fig. 1:** White line on map shows a maximum of 500 feet from the Beltline (zone of elevated pollution exposure), which would include the preschool site, and the south section of Building A.

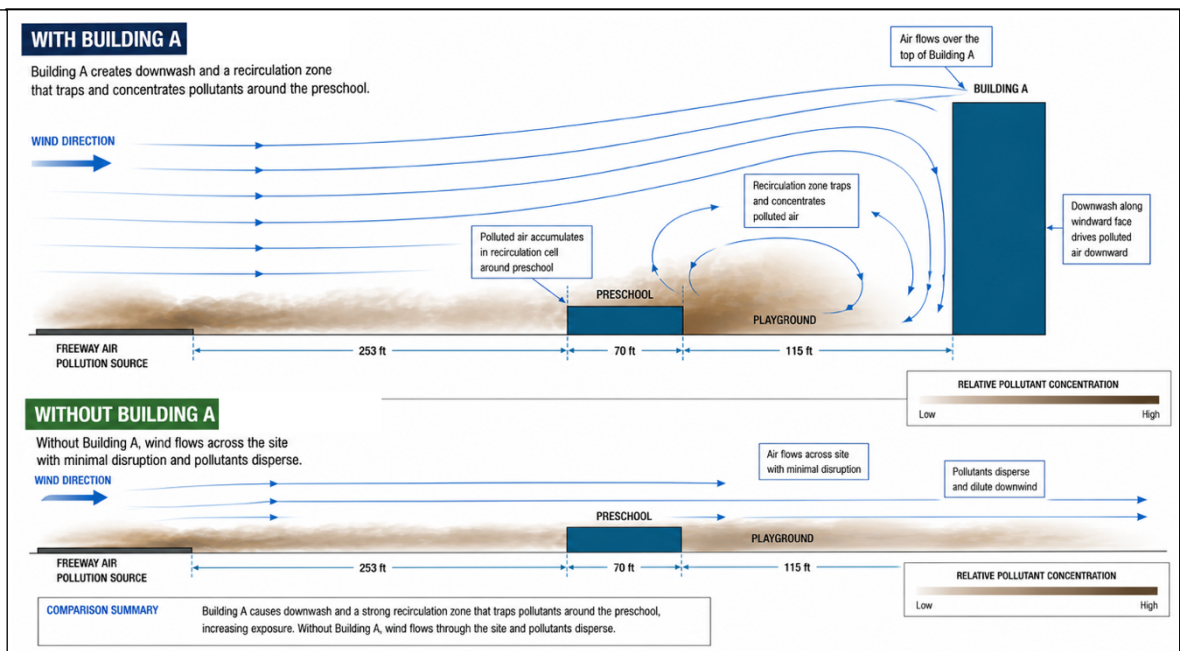
Across U.S. jurisdictions, this principle is most clearly articulated in guidance from the California Air Resources Board, including the *Air Quality and Land Use Handbook*. This widely used framework identifies a zone of elevated pollution exposure within approximately 500 feet of major roadways and emphasizes that schools, childcare facilities, and housing are especially vulnerable. Where such uses are proposed or affected, agencies routinely require **health risk assessments, air dispersion modeling, and mitigation measures**, including changes to building placement, height, and orientation.

This approach is reinforced through environmental review practice under the South Coast Air Quality Management District, where projects near highways or freight corridors must evaluate site-specific exposure and implement design changes when warranted. In these contexts, **building configuration is treated as a key determinant of exposure**, not a neutral design feature.

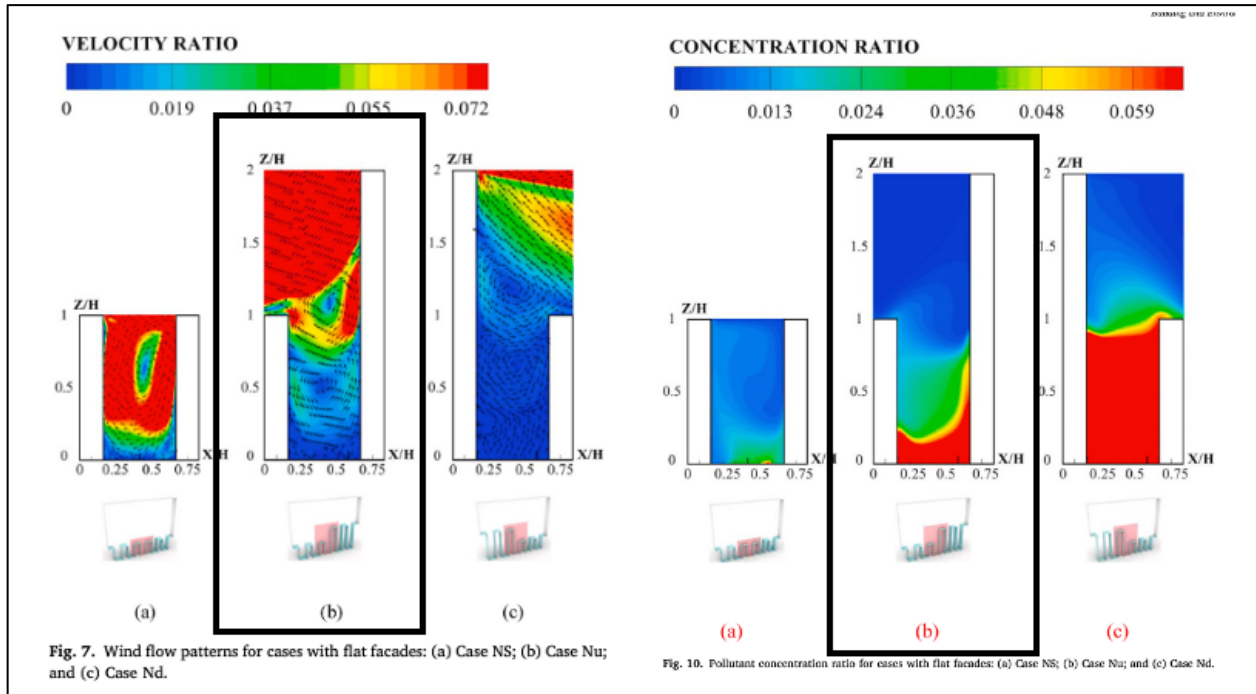
International planning guidance reflects the same standard. The Greater London Authority and Environmental Protection UK require Air Quality Assessments that explicitly evaluate how

building massing may create “street canyon” conditions that trap pollutants. Where such effects are identified, developments are commonly required to **step down building heights, increase spacing, or reconfigure layouts to improve airflow and reduce exposure**. Similarly, the City of Vancouver incorporates “ventilation corridor” planning, requiring building design to maintain air movement and prevent pollutant accumulation.

**Fig. 2:** Schematic of how placing a taller structure downwind of a smaller structure can impact air flow and pollutant concentration due to downwash and recirculation effects. Prevailing wind comes from the S/SW in warmer months with the beltline directly upstream from the site.

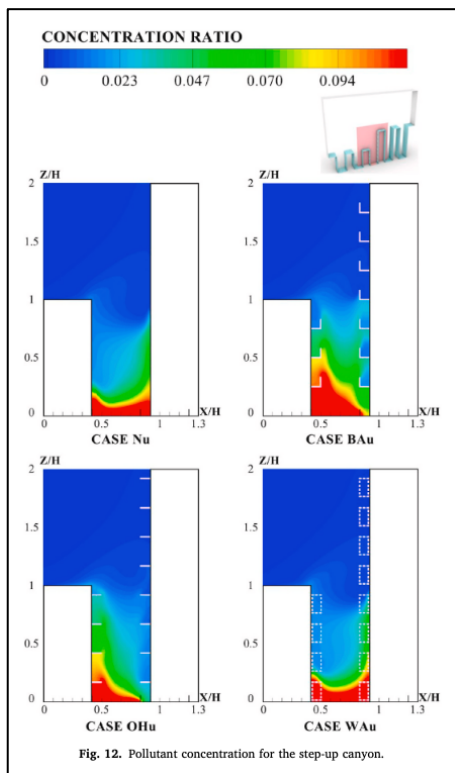


These practices are grounded in a substantial body of scientific literature demonstrating that **unequal building heights**—particularly where a taller structure is located downwind of a smaller one—can create **recirculating airflow patterns that trap pollutants and increase ground-level concentrations**. This phenomenon, commonly referred to as a “street canyon” or “step-up” configuration, is well documented and accepted in urban air quality research.



**Fig. 3:** Impacts to wind velocity ratio (left) and air pollutant concentration ratios (right) based on building design. Relevant to this site, a step-up design is shown in black rectangles (option b). Note decreased wind velocity and higher ground-level concentration ratios at ground-level.

Citation: Cui, D., Li, X., Liu, J., Yuan, L., Mak, C. M., Fan, Y., & Kwok, K. (2021). Effects of building layouts and envelope features on wind flow and pollutant exposure in height-asymmetric street canyons. *Building and Environment*, 205, 108177.



In addition to the building’s overall massing and height, aspects of the envelope design within a canyon can also significantly alter airflow. The addition of balconies (Fig. 4, top right) notably increases pollution concentrations against the leeward wall.

Taken together, these precedents establish a consistent and widely applied principle: **When a development may increase pollution exposure to a sensitive population due to building design or configuration, it is standard practice to require site-specific analysis and, if necessary, modification of building height, massing, or layout to mitigate that risk.** The approval of such a project without evaluating these effects is insufficient to ensure there will be no adverse impact of this development on public health, particularly for a vulnerable and sensitive population of young children who are at substantially increased risk for adverse health effects from air pollutant exposures.

**Fig. 4:** Impact of various step-up building envelope design: flat façade (top left), balconies (top right), overhang (bottom left), wing walls (bottom right).

Citation: Cui, D. et al. (2021). Effects of building layouts and envelope features on wind flow and pollutant exposure in height-asymmetric street canyons. *Building and Environment*, 205, 108177.

## Mitigation Strategies

The California State Policy Evidence Consortium (CalSPEC) leverages University of California expertise in research to support evidence-based policymaking at the state level. **In 2024, CalSPEC released a report based on systemic review of existing scientific literature on the impact of near-roadway air pollution (NRAP) on health effects, and strategies for mitigation.** The consortium found clearly established and consistent evidence that NRAP increases the risk of adverse health effects including asthma in children, diabetes, all-cause mortality, lung cancer mortality, and heart disease mortality. CalSPEC also identified moderate to sufficient evidence that urban design strategies could reduce near roadway air pollution exposure, summarized below.

**Table 17. Summary of Evidence About Built Environment Design Strategies**

Strategies	Design Parameter	Recommended Design	Evidence Rating	Effects of Strategy on Ambient Concentrations
<b>Street canyon configuration</b>	Canyon orientation	Streets parallel to wind directions	Moderate	Increased ventilation and reduced pollutant levels*
	Aspect ratio (AR)	Lower aspect ratio, preferably with height-to-width less than 0.65		
<b>Building architecture</b>	Roof shape	Pitched roofs rather than flat roofs in canyons with AR <1	Moderate	Increased ventilation and reduced pollutant levels*
	Building height	Variable building heights preferred		Reduced 40%–45%
	Building setback	Half open space outside on the side of the building is recommended		Reduced 6%–13%
	Building permeability	Lift-up design with void decks underneath the first floor		Reduced 34%–50%
<b>Land use buffers/ siting</b>	Separation distance from roadways	500 meters away from the roadways	Moderate	Reduce concentration from roadway edge level to background level

*Source: CalSPEC, 2024.*  
 \*Directionality is reported here due to lack of a reference level to compare with or lack of quantitative results for changes in pollutant levels.

Of note, the current design features of Building A directly contradict established mitigating principles:

- **Proposed Design Aspect Ratio ( $AR = H_{max}/W$ ).** In a step-up canyon, AR is more precisely calculated using the height of the taller downwind building ( $H_{max}$ ), which yields a value of 1.48 based on the current specifications. Using the more general AR formula, which averages the building heights, the AR is ~0.85. In this proposal, the height of Building A is **maximized** through a CUP request and the distance between buildings is **minimized** by pushing its setback within ~40 feet of the preschool border as opposed to matching the set-back of the neighboring residential building and existing footprint (~140 ft). Both layout choices **increase the Aspect Ratio** of the canyon, significantly elevating the risk of restricted air flow and air pollution entrapment when compared to the existing site conditions.
- **Roof Shape.** The proposed buildings adopt a flat roof shape, where pitched roofs may improve air flow.
- **Building Height.** Both Building A and B heights are maximized at (or above with CUP) building codes, and are of a similar height of the existing apartment complex on Odana Road. Together, these structures create a dense row of similar heighted massing, as opposed to variable building heights.

# Appendix 1: Detailed List of Precedents and Related Policies

## 1. California Environmental Review Practice (CEQA) – Established U.S. Standard

### Key Source

- California Air Resources Board Air Quality and Land Use Handbook (2005, widely used in CEQA review)

### Core Findings

- Traffic-related air pollution (TRAP) exposure is **elevated within ~500 feet of major roadways**
- Sensitive land uses (schools, daycare centers, housing) are **particularly vulnerable**
- Land use decisions should:
  - Avoid siting sensitive receptors near highways where feasible
  - Require **site-specific analysis and mitigation** where not feasible

### Required / Common Mitigations (documented in CEQA practice)

- Increased setbacks from highways
- Relocation of sensitive uses (e.g., play areas)
- **Building design changes**, including:
  - Orientation relative to pollution source
  - Height and massing adjustments
  - Enhanced ventilation and filtration

### Supporting Evidence

- California Air Resources Board, *Air Quality and Land Use Handbook* (2005)
- South Coast Air Quality Management District, *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning* (2005, updated)

### Precedential Value

This framework is:

- Routinely applied in **thousands of project approvals**
- Used by planning commissions to **condition or redesign projects**
- Considered a **baseline standard of care** in U.S. environmental planning

## 2. Near-Roadway School and Residential Siting Decisions (California Case Practice)

### Example Contexts

- I-710 Corridor (Los Angeles region)
- LAUSD school siting reviews

### Documented Requirements

Projects involving schools or housing near major roadways were required to:

- Conduct **health risk assessments (HRAs)** using dispersion modeling
- Evaluate **building placement and configuration effects**
- Implement design changes such as:
  - Repositioning buildings or play areas
  - Adding barriers or buffers
  - Modifying layout to reduce exposure

### Supporting Sources

- South Coast Air Quality Management District CEQA Air Quality Handbook
- California Office of Environmental Health Hazard Assessment risk assessment guidance
- Los Angeles Unified School District environmental review documents (multiple projects)

### Key Principle Established

Where sensitive populations are present near a pollution source, **site design and building configuration must be evaluated and modified if necessary to reduce exposure.**

## 3. United Kingdom – Air Quality Assessment in Planning Decisions

### Governing Bodies

- Greater London Authority
- Environmental Protection UK

### Requirements

Major developments must:

- Conduct **Air Quality Assessments (AQAs)**
- Evaluate:
  - Building massing effects
  - Street canyon formation
  - Impacts on nearby receptors

### Typical Required Design Changes

- Step-down building heights
- Increased spacing between structures
- Avoidance of enclosed courtyards near pollution sources
- Creation of airflow corridors

### Supporting Documents

- GLA, *Air Quality Neutral / Air Quality Positive Guidance*
- EPUK & IAQM, *Land-Use Planning & Development Control: Planning for Air Quality* (2017)

### Precedential Value

Planning authorities explicitly:

Require **design modification where building form would worsen air quality at sensitive receptors**

## 4. Canada – Ventilation Corridors and Built Form Controls

### Example Jurisdiction

- City of Vancouver

### Planning Practice

- Identification of “**ventilation corridors**” to preserve airflow
- Requirements to:
  - Adjust building height
  - Modify orientation
  - Prevent stagnation zones

### Supporting Sources

- City of Vancouver, *Urban Design Guidelines*
- Metro Vancouver, *Air Quality and Land Use Planning Guidelines*

### Key Principle

Urban form must be designed to **maintain air movement and prevent pollutant accumulation**

## Urban Airflow and “Street Canyon” Research (Scientific Basis for Design Controls)

### Key Findings from Literature

- Building geometry (height, spacing, orientation) strongly controls pollutant dispersion
- “Street canyon” and **step-up configurations (short → tall downwind)**:
  - Create **recirculating vortices**
  - Reduce ventilation
  - Increase pollutant concentrations at ground level

### Representative Sources

- Vardoulakis et al. (2003), *Atmospheric Environment*
- Gromke & Ruck (2009), *Boundary-Layer Meteorology*
- Zhang et al. (2022), *Science of the Total Environment*
- He et al. (2021), urban airflow and high-rise effects

### Key Conclusion

Building height and massing are not neutral—they are **primary determinants of exposure** in near-road environments.

### Precedential Value

These findings are:

- Widely incorporated into **planning guidance and environmental review**
- Used to justify **design modifications** in real-world approvals

## **Core Cross-Jurisdictional Principle**

Across all jurisdictions and sources reviewed, a consistent standard emerges:

**When all three conditions are present:**

1. **A known pollution source** (e.g., highway)
2. **A sensitive receptor** (e.g., children, housing)
3. **A building configuration that may alter airflow**

**Then:**

- **Site-specific analysis is required, and**
- **Design modification is standard practice if risk is identified**

## **Relevance to Conditional Use Permit Decisions**

These precedents directly support the following conclusion:

Where a Conditional Use Permit authorizes building height or massing that may affect pollutant dispersion, and where a sensitive population is adjacent to the site, the approving body must evaluate those effects.

**From:** [Erin riley](#)  
**To:** [Urban Design Comments](#)  
**Subject:** Item 89886 UDC 4/29/26 agenda item 5 comments  
**Date:** Wednesday, April 29, 2026 10:48:40 AM

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To the Board of the Urban Design Commission

I am Erin Riley, a board member of the Montessori Children's House (MCH) and a parent of a child at the same school. I have continued concerns regarding the proposed development on 5555 Odana Road & 5534 Medical Circle.

While the developer has shared the shadow study, which shows that the buildings shouldn't overly shade the school, the committee has also asked for additional tree islands between the buildings and the school.

As the school is located close to the highway and will be boxed in by the apartment buildings on the North and West side, there is reason to be concerned that these buildings will start to create a canyon effect, trapping noise and air pollution near the school and playground. As children are more susceptible to noise and air pollution given their developing brains and bodies, this is an especially notable concern.

I would ask that the committee require the builders to commit to having the tree stands near the school complete prior to the demolitions of the existing buildings as this will help to mitigate the noise and air pollution. I would also ask that the species chosen for these locations be specifically chosen for their ability to mitigate air pollution effects, such as evergreen species, rather than the currently planned deciduous varieties. These will ideally form a "tredge hedge" which is a thick layer of both short and tall trees to provide a filtering effect for air pollution.

I thank the committee for their time and consideration of these comments  
Erin Riley