



# Terwilliger Center for Housing



Sendero Verde is one of the largest certified affordable Passive House residential developments in the world. (Albert Vecerka/Esto)

## ULI CASE STUDY: SENDERO VERDE

— ★ —  
**WINNER**

**ULI TERWILLIGER CENTER**

**2025**

**AWARD FOR  
INNOVATION IN  
ATTAINABLE HOUSING**

### NEW YORK, NEW YORK

**LOCATION:**

50 and 60 East 112th Street, and 75 East 111th Street (*East Harlem, full city block bounded by Park Avenue, Madison Avenue, and 111th and 112th streets*)  
New York, New York

**PROJECT TYPE:**

Mixed-use, affordable housing

**UNITS:**

709

**SIZE:**

750,000 square feet

**COST:**

\$445.8 million

**COMPLETION DATE:**

2024

**OWNER:**

Jonathan Rose Companies, L+M Development Partners, Acacia Network (co-developers/owners)

**OPERATOR:**

C+C Apartment Management (property management)

**PARTNERS:**

Handel Architects, Steven Winter Associates, Cosentini, DeSimone, Langan, AECOM, Union Settlement, Promesa/Acacia Network, New York City Housing Preservation and Development, New York City Housing Development Corporation, Goldman, Bank of America, New York State Energy Research and Development Authority

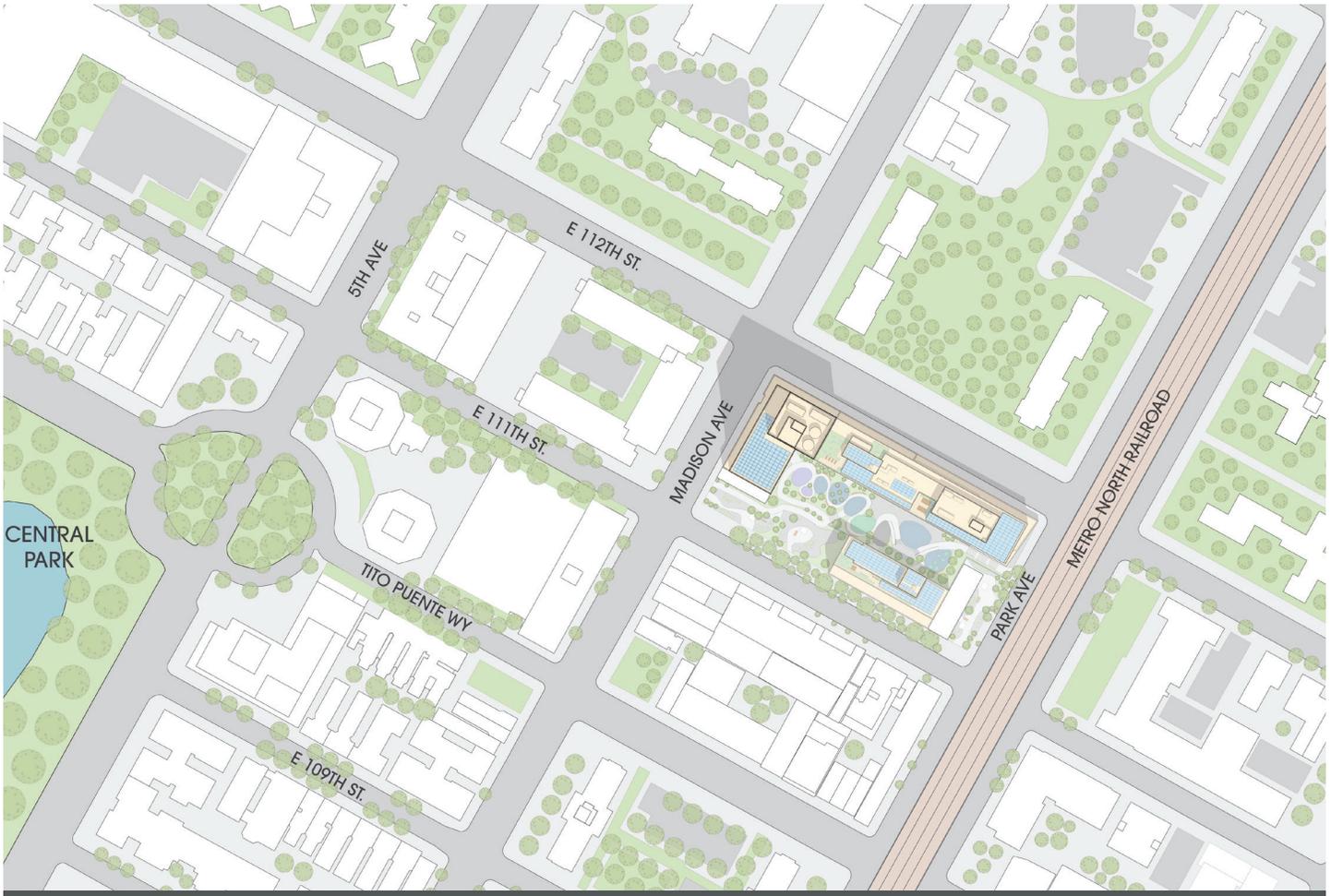
**PROJECT WEBSITE:**

<https://www.senderoverdenyc.com>

**CONTACT:**

Sabrina Barker, Senior Director of Development, Jonathan Rose Companies

Jessica Yoon, Managing Director, L+M Development Partners



Sendero Verde is a transformative mixed-use development that occupies an entire city block in East Harlem with 709 apartments, all affordable. (Handel Architects)

## Project Overview

Sendero Verde is a transformative mixed-use development in East Harlem and one of the largest Passive House affordable residential projects in the world. Completed in 2024, it delivers 709 affordable apartments, ranging from studios to three-bedroom units. Households range from formerly homeless to middle-income families earning up to 110 percent of area median income (AMI).

The development also incorporates a 72,000-square-foot K–5 charter school, approximately 14,000 square feet of community and cultural facility space, neighborhood-serving retail, and three community

gardens. Conceived as a Community of Opportunity, Sendero Verde weaves together housing, education, health, cultural, and economic supports to create a resilient neighborhood anchor.

Residents benefit from on-site services provided by trusted local partners such as Promesa (an affiliate of the Acacia Network) and Union Settlement, including behavioral health care, arts programming, youth and family enrichment, and senior services. Amenities such as fitness centers, computer labs, rooftop terraces, and multipurpose rooms are available to all households in each building.



Sendero Verde includes a 72,000-square-foot K–5 charter school, approximately 14,000 square feet of community and cultural facility space, neighborhood-serving retail, and three community gardens. (Handel Architects)

## Planning and Design

Sendero Verde originated from New York City’s 2016 SustainNYC request for proposals (RFP) that sought both deep affordability and Passive House performance. The RFP emphasized not just energy efficiency, but also integration with the surrounding community in East Harlem. The winning team—Jonathan Rose Companies, L+M Development Partners, and Acacia Network—proposed a Community of Opportunity model that wove housing together with education, health, and cultural programming.

The project occupies an entire city block and is organized into three distinct buildings, with two mid-rise wings and a 34-story tower linked by an expansive central courtyard. The design preserves open space for gardens, gathering areas, and natural light by concentrating height along the northwest corner, while maximizing density across the site.

The three-building configuration offers a mixed-use living environment that includes the following:

- Two mid-rise wings (8–15 stories) that frame the central courtyard and create a scale consistent with East Harlem’s streetscape;
- A 34-story tower that provides high-density housing while preserving open green space and maximizing daylight penetration;
- A 72,000-square-foot K–5 charter school with a gymnasium, cafeteria, and classroom spaces;
- Over 14,000 square feet of community and cultural facilities, including multipurpose rooms, computer labs, and a performing arts/cultural space;
- A fitness center, resident lounges, and rooftop gardens for resident use;
- Three community gardens, designed in collaboration with neighborhood gardeners; and
- 4,000 square feet of retail frontage to bring services and small businesses to the block.

## Passive House Design

Sendero Verde is one of the largest certified affordable Passive House residential developments in the world. Passive House is a rigorous, performance-based building standard that originated in Germany in the late 1980s and has since become an internationally recognized benchmark for sustainable design. At its core, Passive House is about creating a highly efficient building envelope and systems that keep indoor spaces comfortable with minimal energy.

“Passive House made the objective clear and performance-based—less ‘sell the green story,’ more ‘design to the standard.’ It focused us on technical pathways that were cost-appropriate for affordable housing.”

– Jessica Yoon, managing director,  
L+M Development Partners

At Sendero Verde, an efficient mechanical, electrical, and plumbing system is particularly central to keep the building comfortable. In effect, the building is constructed like a thermos, and the mechanical system ensures that fresh air is continuously delivered. The additional insulation and high-performance windows are also important to keep tempered air inside the building and reduce drafts.

The design team, led by Handel Architects and sustainability consultants Steven Winter Associates, integrated energy efficiency and resilience strategies throughout the project. Sendero Verde’s planning and design process became a model for how policy-driven requirements can catalyze innovation and push affordable housing development toward climate goals.

Key elements of the Passive House approach at Sendero Verde include the following:

- **Airtight building envelope:** Use of liquid-applied vapor barriers and continuous insulation create a highly airtight structure, reducing energy loss and improving indoor air quality.
- **High-performance windows:** Triple-glazed windows minimize drafts, reduce noise infiltration from nearby elevated subway tracks, and enhance thermal comfort.
- **Efficient mechanical systems:** The buildings employ variable refrigerant flow heating and cooling systems, paired with centralized energy recovery ventilators that supply filtered fresh air year-round.
- **Thermal resilience:** The Passive House standard ensures apartments maintain stable indoor temperatures during both extreme heat and cold, providing resilience during grid disruptions or climate events.

These design choices reduce projected energy use by nearly 50 percent compared to a code-compliant multifamily building. Residents benefit from lower utility costs, healthier indoor environments, and quieter apartments.

# Costs and Financing

Sendero Verde’s financing reflects the complexity of building a 709-unit, 100 percent affordable Passive House development on a full city block in New York City. The capital stack combined multiple sources, each tailored to specific project elements.

A project of this scale required careful coordination across financing streams, each with its own calendar. Low-income housing tax credit (LIHTC) allocations, bond issuances, and Brownfield tax credit audits all operated on different schedules. Delays in one source risked cascading impacts on others, particularly as market conditions shifted during tax reforms that reduced LIHTC pricing. Later, the COVID-19 pandemic introduced cost inflation and supply-chain disruptions. To mitigate these risks, the development

team sequenced financing by phasing construction. The project first delivered community-facing amenities and mid-rises and deferred the tower until financing stabilized.

Constructing to Passive House standards increased upfront hard costs by an estimated 6 to 8 percent compared to conventional code-compliant affordable housing. This premium was absorbed through a combination of Brownfield equity, New York State Energy Research and Development Authority (NYSERDA) support, and deeper collaboration with New York City Housing Preservation and Development (HPD) and the New York City Housing Development Corporation (HDC).

## PRO FORMA: SENDERO VERDE

Source	Amount (\$)
4 percent LIHTCs: Bank of America/Goldman Sachs	142,390,000
Hard debt: HDC	106,125,000
Soft debt: HDC	35,000,000
Soft debt: HDC and HPD	108,310,000
NYSERDA grant	1,262,500
Brownfield tax credits: Bank of America/Goldman Sachs	18,987,000
Developer equity	5,414,000
Deferred interest/developer fee	28,331,840
<b>Total sources</b>	<b>445,820,340</b>

Use	Amount (\$) Residential Only	Amount (\$) Full Development
Acquisition (land and improvements)	0	0
Hard costs	270,821,200	308,859,200
Soft costs	30,835,180	34,222,320
Financing and related costs	52,163,400	59,655,400
Reserves and contingency	4,641,400	6,108,570
Other costs: Paid and deferred developer fee; deferred fee was high in order to generate additional tax credit equity	36,974,850	36,974,850
<b>Total uses</b>	<b>395,436,030</b>	<b>445,820,340</b>



Sendero Verde demonstrates that deep affordability and climate-forward design can be achieved jointly. (Albert Vecerka/Esto)

## Community Engagement

From the outset, community engagement shaped Sendero Verde's design and program. Aligning with the broader East Harlem Neighborhood Plan, the project emphasized affordability, open space, and cultural preservation. Neighborhood residents and stakeholders were invited into design charrettes and workshops, where they voiced priorities: ensuring

affordability across income levels, preserving community gardens, and providing education and social services on site. The longstanding GreenThumb gardeners—who had been cultivating plots on the site for decades—informed the final design that included three new community gardens within the development.

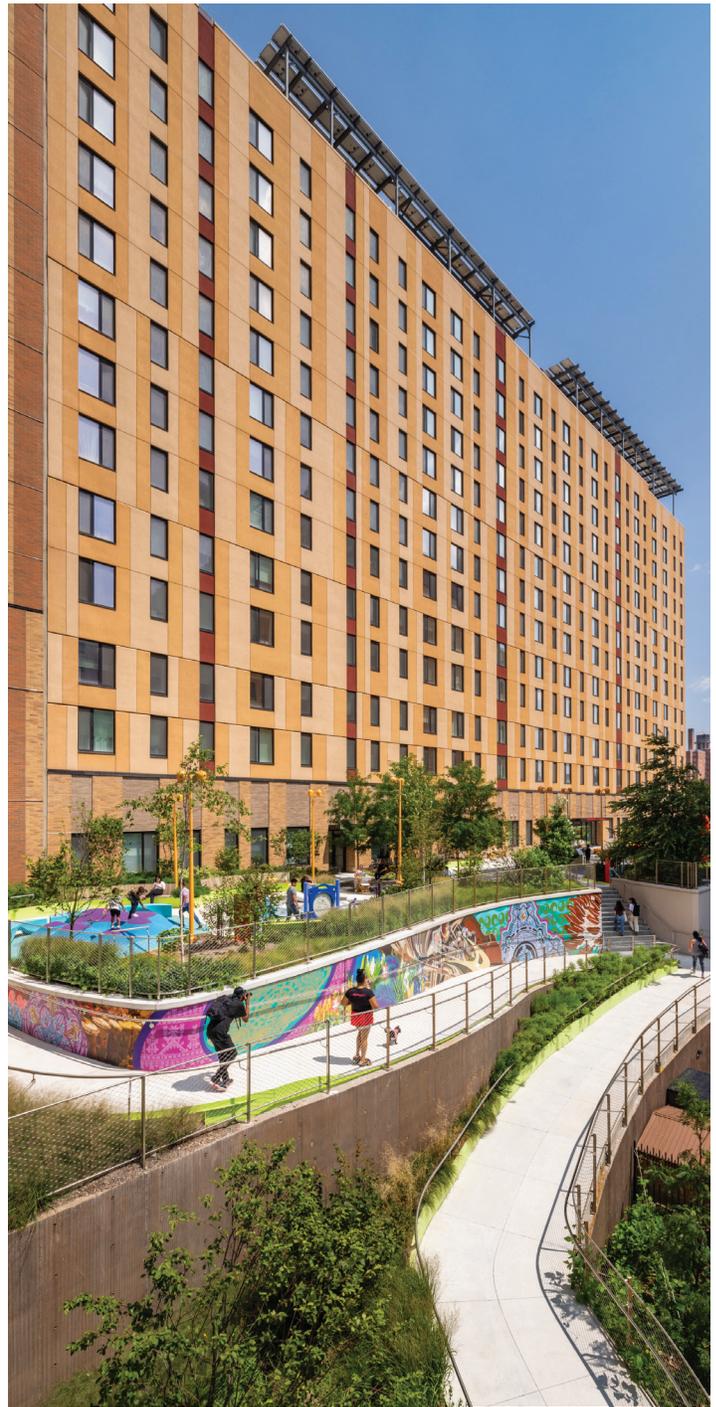
The design process sought to celebrate East Harlem’s cultural richness. Local artists were commissioned to contribute murals, photography, and installations throughout the property. The colorful courtyard, designed as a central gathering space, features bold palettes.

Community partners were integrated into the project to ensure programming met local needs.

- Acacia Network serves multiple roles as co-developer, service provider, and operator of the on-site Community Arts Center, which hosts exhibitions, performances, and cultural events. Acacia, through one of its affiliate entities, Promesa, also provides behavioral health, youth programming, and supportive housing services.
- Union Settlement, one of East Harlem’s oldest and largest community organizations, operates a Family Enrichment Center that offers resources for seniors, youth, and families. Programs include after-school activities, counseling, job-readiness training, and senior engagement.
- The K–5 charter school, built in partnership with Harlem Children’s Zone’s Promise Academy II, anchors the site as an educational hub. Its gymnasium, cafeteria, and event spaces double as community resources after hours.

“Acacia is a co-developer/owner, services provider, and a tenant operating a community arts center. Their involvement brought vibrant programming aligned with the neighborhood.”

– Jessica Yoon, managing director,  
L+M Development Partners



Sendero Verde originated from New York City’s 2016 SustainNYC Request for Proposals that sought both deep affordability and Passive House performance. (Albert Vecerka/Esto)

# Policy Profile: Sendero Verde

*ULI Terwilliger Center's Policy Profiles highlight the public policies that made the project possible. They showcase local, state, or federal tools—such as financing incentives, regulatory changes, or permitting reforms—and distill lessons other communities can adapt to expand housing affordability and choice.*

## Overview

Sendero Verde was made possible through a combination of City-led policy innovation, state and federal incentives, and targeted financing tools. Together, these policies enabled the development of a 709-unit, 100 percent affordable, large-scale Passive House project with deep affordability and robust community amenities.

## SustainNYC RFP

New York City HPD issued the SustainNYC RFP in 2017, requiring projects on City-owned land to combine deep affordability with Passive House standards. This was among the first competitions nationally to tie public land disposition to both climate and affordability goals.

*Impact on Sendero Verde:* The SustainNYC RFP was the direct catalyst for Sendero Verde, ensuring that Passive House certification and broad affordability were embedded in the project from the start. It aligned the development team's proposal with the City's climate resilience and equity agenda, setting the framework for the Community of Opportunity model.



Sendero Verde was made possible through a combination of City-led policy innovation, state and federal incentives, and targeted financing tools. (Albert Vecerka/Esto)

## Property Tax Abatements: 420-C and Article XI

New York City property tax exemption 420-C is available for affordable housing projects sponsored by charitable or nonprofit organizations. It provides a substantial reduction in property taxes for up to 60 years, tied to long-term affordability commitments.

Article XI of the New York State Private Housing Finance Law authorizes local governments to grant property tax exemptions to limited-profit housing companies, nonprofits, or housing development fund corporations that develop and operate affordable housing. These exemptions typically extend for 40 years or more, with the possibility of renewal if affordability is maintained.

*Impact on Sendero Verde:* The project affordability depended heavily on these abatements. Property taxes are one of the largest operating expenses for multifamily housing in New York City. Without long-term abatements, the deep affordability structure would not have been financially viable.

- **Phase I of the project used 420-C**, locking in affordability for 60 years.
- **Phase II used Article XI**, ensuring affordability for 40 years, reinforced by regulatory agreements with HPD and HDC that extend protections effectively in perpetuity.

## HPD and HDC Financing Programs

HPD's ELLA (Extremely Low- and Low-Income Affordability) and Mix & Match programs provided subsidies for deep affordability ( $\leq 30$  percent and  $\leq 50$  percent of AMI) while supporting a range of incomes up to 110 percent of AMI. HDC paired these subsidies with tax-exempt bonds to deliver lower-cost debt financing.

*Impact on Sendero Verde:* These programs shaped the project's affordability mix and ensured long-term regulatory agreements tied to property tax abatements (420-C and Article XI). Without them, the breadth of affordability and permanence of restrictions would not have been financially feasible.

## NYC 15/15 Supportive Housing Initiative

Launched in 2016, NYC 15/15 is the City's largest supportive housing initiative, aiming to create 15,000 units of supportive housing over 15 years. The program provides two funding streams:

- **Rental assistance:** Residents pay 30 percent of their income toward rent, with the remainder covered by a City-funded subsidy structured like a building-based Housing Assistance Payment contract.
- **On-site services funding:** Through the NYC Human Resources Administration, nonprofit partners deliver case management, behavioral health care, and housing stability services.

*Impact on Sendero Verde:* The 15/15 program allowed the project to deepen affordability, while ensuring supportive housing for formerly homeless households to help them succeed in a mixed-income environment. In Phase I, 10 percent of the units were allocated to families exiting shelter. In Phase II, 15 percent of the units were reserved for supportive housing. An on-site services suite designed specifically for Acacia Network/Promesa staff ensures that residents have ready access to services.

“15/15 was brand new when we started; being early adopters made the services financially feasible. We built an on-site social-services suite with multiple offices serving both phases.”

– Sabrina Barker, senior director of development, Jonathan Rose Companies



All of Sendero Verde's apartments are income-qualified, with rents structured across a broad spectrum of income levels. (Albert Vecerka/Esto)

## Brownfield Tax Credits

New York State's Brownfield Cleanup Program provides tax credits for remediation of contaminated sites, including refundable credits tied to cleanup costs and redevelopment.

*Impact on Sendero Verde:* Sendero Verde's site required significant remediation. The project leveraged approximately \$19 million in Brownfield tax credit equity, closing a crucial financing gap and offsetting the incremental costs of Passive House construction.

## NYSERDA Incentives

NYSERDA offers grants and technical assistance to advance energy efficiency and renewable energy in buildings.

*Impact on Sendero Verde:* NYSERDA support helped defray the 6–8 percent cost premium associated with Passive House construction. This incentive was essential in proving that large-scale affordable housing could achieve ambitious energy performance standards.

## Key Takeaways for Policy and Practice

- **Leverage public land for innovation.** Competitively awarded RFPs for the redevelopment of publicly owned land can set new standards by linking affordability with climate-forward design.
- **Pair affordability with long-term regulatory agreements.** Combining LIHTCs with local abatement programs (420-C, Article XI) ensures lasting affordability.
- **Pair rental assistance with service funding.** Supportive housing programs such as NYC 15/15 enable affordable housing developments to serve extremely vulnerable populations.
- **Use state-level tax credits to fill gaps.** Brownfield and clean energy incentives can bridge financial shortfalls to unlock transformative projects.

# Construction Process

Sendero Verde was executed in two distinct phases to balance financing complexity, construction logistics, and community priorities.

- **Phase I (2019–2022):** The first phase delivered 361 units across two mid-rise buildings, along with the charter school shell, community facilities, and much of the publicly accessible open space. This sequencing ensured that community-facing amenities and educational infrastructure were operational early in the project’s life.
- **Phase II (2022–2024):** The second phase focused on the 34-story residential tower at the northwest corner, adding 348 units and additional ground-floor retail and community space. This phase completed the massing strategy and reinforced the site’s visual identity along Park Avenue.

## Passive House Implementation at Scale

As one of the largest Passive House projects globally, Sendero Verde required new levels of coordination across disciplines. L+M’s in-house construction arm, L+M Builders Group, collaborated with Steven Winter Associates to train subcontractors and laborers in Passive House techniques. On-site crews underwent workshops on air-sealing, vapor barriers, and window installation—treating these tasks as mission-critical quality control steps.

Construction occurred during volatile market conditions, spanning both the 2017 federal tax credit reform and the COVID-19 pandemic, which introduced supply-chain disruptions and inflation. The development team worked closely with HPD and HDC to re-size subsidies and adjust phasing.

## Workforce Development

Sendero Verde doubled as a workforce pipeline for local residents. The development team partnered with Acacia Network and community organizations to sponsor OSHA-certified safety trainings for East Harlem residents. Over 75 participants gained credentials that facilitated entry into unionized construction jobs, creating tangible employment benefits in addition to the housing and community facilities.



Amenities at Sendero Verde include resident lounges and rooftop gardens for resident use. (Albert Vecerka/Esto)

“ We assembled a highly experienced Passive House team: Handel [the architect] had done the only other large multifamily Passive House in NYC then. . . . That technical readiness likely stood out. ”

– Sabrina Barker, senior director of development, Jonathan Rose Companies

# Housing Affordability and Unit Mix

All of Sendero Verde’s apartments are income-qualified, with rents structured across a broad spectrum of income levels. Fifty percent of the project’s units are designated as permanently affordable, while the other half of the units have 40- and 60-year terms of affordability. The development provides housing for residents ranging from formerly homeless households to those earning up to 110 percent of AMI.

All residents, regardless of income level, have access to the same suite of amenities: fitness centers, rooftop gardens, computer labs, multipurpose rooms, and cultural programming. This approach reinforces equity in design, ensuring no household is segregated by affordability band or supportive housing status.

UNITS	Number of Units by Bedrooms and Affordability Level						Monthly Rent (\$)	
	Rental Units		Rental Unit Configuration					
	Total Number	Percent	Studio	1BR	2BR	3+ BR	Low	High
Units at or below 30% of AMI	196	28%	35	70	61	30	-	856
Units between 31 and 60% of AMI	228	32%	65	93	50	20	558	1,957
Units between 61 and 80% of AMI	72	10%	18	25	20	9	1,241	2,140
Units between 81 and 120% of AMI	211	30%	61	88	45	17	1,463	3,170
<b>Total rental units</b>	<b>707</b>	<b>100%</b>	<b>179</b>	<b>276</b>	<b>176</b>	<b>76</b>		

	Total Number	Percent	Studio	1BR	2BR	3+ BR
Total units at or below 60% of AMI	424	60%	35	70	61	30
Total units between 61 and 120% of AMI	283	40%	61	88	45	17
<b>Rental units</b>	<b>707*</b>	<b>100%</b>	<b>179</b>	<b>276</b>	<b>176</b>	<b>76</b>
<b>Total units</b>	<b>709</b>					

\* Includes two superintendent units



All residents, regardless of income level, have access to the same suite of amenities: fitness centers, rooftop gardens, computer labs, multipurpose rooms, and cultural programming. (Albert Vecerka/Esto)

## Marketing and Performance

New York City's Housing Connect lottery system handled marketing for Sendero Verde. Thousands of applications were submitted for the first phase of apartments. Phase I lease-up also occurred during the COVID-19 pandemic, which presented logistical hurdles for tours and resident intake.

Despite these hurdles, occupancy reached over 80 percent by mid-2024, with the tower lease-up underway immediately after completion. The phased approach to marketing ensured that units across different affordability levels leased at a steady pace.

# Lessons Learned

- **Use policy innovation as a catalyst.** The SustainNYC RFP linked affordability with Passive House standards, setting a new bar for what affordable housing could achieve. The City demonstrated that ambitious environmental and social goals can be advanced simultaneously when policy frameworks are well designed.
- **Determine feasibility of Passive House design at scale.** The project delivered Passive House design at the largest scale of affordable housing. Key conditions for success included early team alignment around technical goals. Contractor and workforce training ensured airtightness and construction precision. Close collaboration with public agencies adjusted underwriting assumptions as needed.
- **Sustainable design delivers long-term benefits for affordable housing.** Building Sendero Verde to Passive House standards carried an estimated 6 to 8 percent cost premium compared to conventional affordable housing construction. However, the long-term benefits outweighed the initial costs. Benefits include lower utility costs for low- and moderate-income households, stabilized operating costs for owners, and improved resilience—including better indoor air quality and durability against extreme weather.
- **Phased delivery provides benefits.** Phasing the project allowed the development team to sequence financing and delivery in ways that reduced risk. Delivering the mid-rises and school first ensured that the community saw tangible benefits early, fostering credibility. Deferring the tower to Phase II provided time to stabilize funding during volatile economic conditions (tax reform and COVID-19).
- **Community engagement provides risk mitigation and value.** Engagement with the local community board, gardeners, and cultural groups was not only a social good but a practical necessity for project success. Preserving and reimagining the community gardens defused a major source of potential opposition. Embedding cultural programming and trusted service providers such as Acacia Network and Union Settlement ensured the project met real community needs, strengthening local support.
- **Layered financing requires timing agility.** The project’s financing revealed how misaligned timelines across funding sources—from LIHTC allocations to Brownfield tax credit audits—can create risk. Flexibility and close coordination with HPD and HDC were essential in managing these complexities.
- **Resident-centered design matters.** Sendero Verde highlighted the importance of focusing on the resident experience. Features such as quieter apartments, reduced energy bills, healthier indoor air, and resilience during wildfire smoke and heat waves reinforced the project’s value.

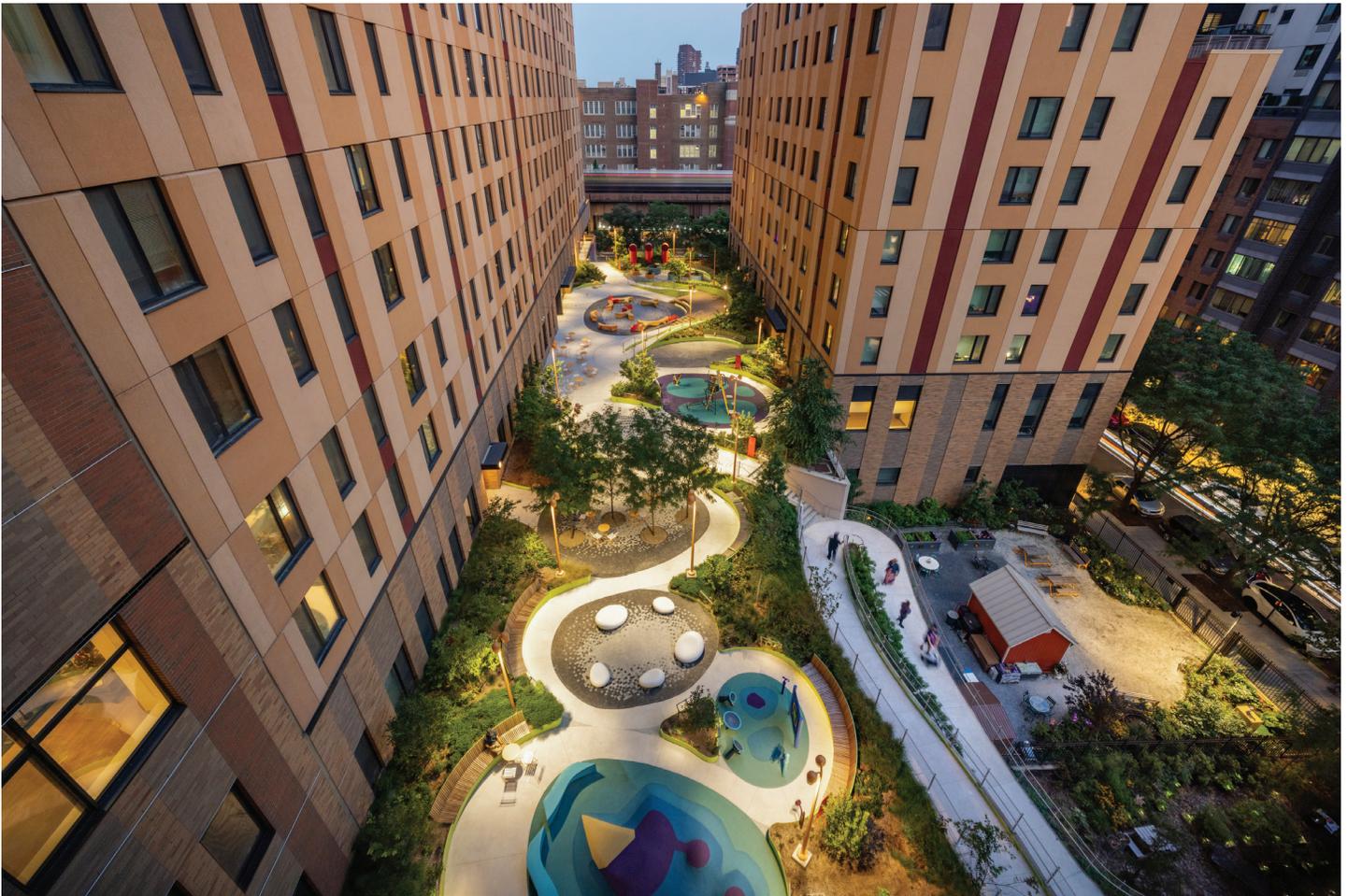
“ Triple-pane windows deliver thermal benefits and noticeably lower noise—apartments are very quiet. We’ve heard anecdotes of fewer asthma flare-ups, likely tied to better indoor air quality. ”

– Jessica Yoon, managing director,  
L+M Development Partners

# Conclusion

Sendero Verde represents a transformative model of affordable housing, demonstrating that deep affordability and climate-forward design can be achieved in tandem. By tying Passive House standards to the SustainNYC RFP, the City pushed the development community to integrate affordability with sustainability at an unprecedented scale. The result is a project that not only reduces utility costs for low- and moderate-income households, but enhances residents' health and comfort.

Sendero Verde's housing affordability serves households across the income spectrum by combining traditional affordable housing programs with supportive housing set-asides and mixed-income financing. The development ensures both deep affordability for the most vulnerable as well as long-term financial viability for affordable housing. The seamless integration of supportive services creates a community where families exiting shelter can thrive alongside working households.



The project is organized into three distinct buildings, with two mid-rise wings and a 34-story tower linked by an expansive central courtyard. (Albert Vecerka/Esto)

# About the Urban Land Institute

The Urban Land Institute is a global, member-driven organization comprising more than 45,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 84 countries.

The extraordinary impact that ULI makes on land use decision-making is based on its members sharing expertise on a variety of factors affecting the built environment, including urbanization, demographic and population changes, new economic drivers, technology advancements, and environmental concerns.

Peer-to-peer learning is achieved through the knowledge shared by members at thousands of convenings each year that reinforce ULI's position as a global authority on land use and real estate. Each year, thousands of events, both virtual and in person, are held in cities around the world.

Drawing on the work of its members, the Institute recognizes and shares best practices in urban design and development for the benefit of communities around the globe.

More information is available at [uli.org](https://uli.org). Follow ULI on [X \(formerly known as Twitter\)](#), [Facebook](#), [LinkedIn](#), and [Instagram](#).

# About the Terwilliger Center

The mission of the Terwilliger Center for Housing is to ensure that everyone has a home that meets their needs at a price they can afford. Established in 2007 with a gift from longtime member and former ULI chairman J. Ronald Terwilliger, the Center's activities include technical assistance engagements, forums and convenings, research and publications, and an awards program. The goal is to catalyze the production and preservation of a full spectrum of housing options. [Learn more.](#)

Author: Deborah L. Myerson  
Senior Research & Policy Fellow,  
ULI Terwilliger Center for Housing

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20036-4948

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