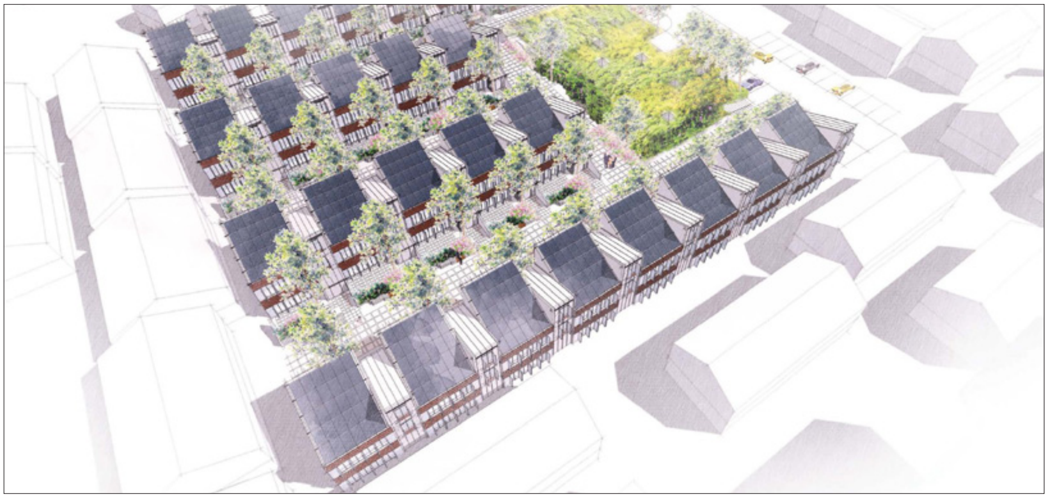

High Performance, High Density, High Ambitions: Housing for the Salem Housing Authority

Winter/Spring 2011 • Architecture

Shane O'Neil • Architecture

Peter Keyes • Associate Professor • Architecture

UNIVERSITY OF OREGON

SCI
Sustainable Cities Initiative

Acknowledgements

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About SCI

The Sustainable Cities Initiative (SCI) is a cross-disciplinary organization at the University of Oregon that seeks to promote education, service, public outreach, and research on the design and development of sustainable cities. We are redefining higher education for the public good and catalyzing community change toward sustainability. Our work addresses sustainability at multiple scales and emerges from the conviction that creating the sustainable city cannot happen within any single discipline. SCI is grounded in cross-disciplinary engagement as the key strategy for solving community sustainability issues. We serve as a catalyst for expanded research and teaching, and market this expertise to scholars, policymakers, community leaders, and project partners. Our work connects student energy, faculty experience, and community needs to produce innovative, tangible solutions for the creation of a sustainable society.

About SCY

The Sustainable City Year (SCY) program is a year-long partnership between SCI and one city in Oregon, in which students and faculty in courses from across the university collaborate with the partner city on sustainability and livability projects. SCY faculty and students work in collaboration with staff from the partner city through a variety of studio projects and service-learning courses to provide students with real-world projects to investigate. Students bring energy, enthusiasm, and innovative approaches to difficult, persistent problems. SCY's primary value derives from collaborations resulting in on-the-ground impact and forward movement for a community ready to transition to a more sustainable and livable future. SCY 2010-11 includes courses in Architecture; Arts and Administration; Business Management; Interior Architecture; Journalism; Landscape Architecture; Law; Planning, Public Policy, and Management; Product Design; and Civil Engineering (at Portland State University).

About Salem, Oregon

Salem, the capital city of Oregon and its third largest city (population 157,000, with 383,000 residents in the metropolitan area), lies in the center of the lush Willamette River valley, 47 miles from Portland. Salem is located an hour from the Cascade mountains to the east and ocean beaches to the west. Thriving businesses abound in Salem and benefit from economic diversity. The downtown has been recognized as one of the region's most vital retail centers for a community of its size. Salem has retained its vital core and continues to be supported by strong and vibrant historic neighborhoods, the campus-like Capitol Mall, Salem Regional Hospital, and Willamette University. Salem offers a wide array of restaurants, hotels, and tourist attractions, ranging from historic sites and museums to events that appeal to a wide variety of interests. 1,869 acres of park land invite residents and visitors alike to enjoy the outdoors.

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Executive Summary

In collaboration with Peter Keyes's 2011 Advanced Architectural Design Studio at the University of Oregon and the Sustainable Cities Initiative, the City of Salem and the Salem Housing Authority (SHA) sought to re-imagine the future of public housing so that it would dignify those who inhabit it and do so in a more economically, environmentally, and ecologically sustainable manner than is currently the norm.

The impetus for this collaborative effort arises from multiple changing global and local contexts, including population growth, increasing uncertainty in the housing market, urban / suburban sprawl, and the need for resource efficiency and sustainability in the built environment. In response to this complex problem, the students adopted an atypical approach to an architectural design studio, organized around critically examining the contexts from which the design is realized before considering the design of the built environment.

Following their research and analysis, the students generated room, unit, and building prototypes based on an understanding of their relationship to different local contexts. The students subsequently developed infill and redevelopment proposals for three multi-family properties currently owned by the SHA: Orchard Village, Meadowlark Village, and Glen Creek. The SHA provided students a list of goals focused on optimizing the use of available resources, including energy, land, water, and materials. Building on the SHA's goals, the students sought to elevate perceptions of what is possible in low-income housing.

Each proposal and recommendation exists in the context of high-density development using low-rise (less than four-story) buildings. The students offered vibrant proposals for high density at each of the SHA multi-family sites, along with global recommendations for design and construction of housing in the Pacific Northwest.

The students' global recommendations for the SHA can be generalized as follows: promote sense of dignity, identity, and ownership; implement passive design strategies; design resilient, future-proofed housing; build high-performance housing; and integrate local food production networks into public housing. The types of and designs for housing that can result from these recommendations can be seen in the students' infill and redevelopment proposals for Orchard Village, Meadowlark Village, and Glen Creek.

Throughout the process, the students prioritized the creation of long-term value and quality over short-term expediency. For the SHA, the recommendations in this report could result in housing that lasts longer, performs better, costs less to operate, costs less to live in, and instills confidence in its residents. The SHA has an opportunity to create sites that are safer to live on, provide more housing opportunities, make better use of open spaces, create pedestrian- and child-friendly environments, and support the goals of the City of Salem to accommodate a growing population using existing residential land.

Introduction

Market-oriented housing policy is essentially the status quo in the United States. Driven by private development interests, the housing market caters to the economically empowered and inherently excludes those living with minimal means. In Salem, 26% of owner-occupied households and 42% of renter-occupied households pay more than 35% of their income toward housing (Parker and Goodman 2011). The recent housing market crash evidenced the volatility of such exclusionary market policies and highlighted a need for low-income housing. In many parts of the country, Salem in particular, population growth threatens to exacerbate the need for low-income housing in an already stressed public housing infrastructure. Within the Salem-Keizer Urban Growth Boundary (UGB), a population increase of 66,000 new residents (27.4% of the current population) is estimated in the next 20 years (Parker and Goodman 2011). In order for the Salem Housing Authority (SHA) to keep pace with current demands for low-income housing in the face of population growth alone – it currently serves 9,372 individuals as of January 2011 (SHA 2011a) at an average occupancy rate of 98% (SHA 2011b) – it can anticipate housing an additional 2,570 residents. Predominantly suburban, at an average density of 7.7 dwelling units per acre in the Salem-Keizer area (Parker and Goodman 2011), the City of Salem has identified increasing the average density of new developments and supporting high-density infill developments as a common sense approach to accommodate population growth. The construction of new low-income housing units is inevitable if the City of Salem is to continue to serve those whom the market cannot.

Recognizing the impetus to develop strategies that respond to multiple changing contexts, the SHA is using this opportunity to critically examine the way the City of Salem designs, develops, and builds low-income housing as well as to propose new visions of how the city can support higher density. In collaboration with the SHA, Professor Peter Keyes's 2011 Advanced Architectural Design Studio explored new ways to provide low-income housing options that dignify those who inhabit such housing, and do so in a more environmentally, ecologically, and economically sustainable manner than is currently the norm.

Project Goals

The SHA provided students with the following brief list of general goals to guide site-specific proposals:

- Optimize energy use.
- Protect and conserve water.
- Incorporate environmentally preferable products.
- Enhance indoor environmental quality.
- Optimize operations and maintenance practices.

- Balance market-driven realities for density, mixed income, neighborhood compatibility, and financial feasibility with community interests.
- Consider infill and redevelopment options for existing SHA multi-family properties.
- Produce design proposals displaying a range of integrated strategies and concepts to inform future SHA or market-rate housing projects that meet the above goals.

Global and Local Contexts

Global contexts are those that exist nearly universally in American housing and inform all design decisions made on an individual site. The student goals listed above all are responses to global contexts of housing in America. In essence, recommendations that arise from global contexts are principles of design. Global recommendations form the intellectual and analytical basis for any design work. Of the goals provided by the SHA listed above, the following are responses to global contexts: optimize energy use, protect and conserve water, optimize site use, enhance indoor environmental quality, and optimize operations and maintenance practices.

Local contexts pertain to specific sites. While similar local contexts can be found in many different areas, they are a product of individual circumstances and are treated as the unique issues of a particular place. Student responses to local contexts found at the SHA multi-family properties will be discussed in more detail in the Local Recommendations section of this report. Of the SHA goals listed above, the following are responses to local contexts: consider infill and redevelopment options for existing SHA multi-family properties; and balance market-driven realities for density, mixed income, neighborhood compatibility, and financial feasibility with community interests.

The students, throughout the course of the studio, also developed individual goals that would guide their personal designs. The students' goals emerged as a natural product of the studio methodology, focusing first on global contexts, and can be generalized as follows:

- Explore new housing typologies and assess their responsiveness to issues of density, affordability, livability, and resource efficiency.
- Create integrated strategies that work to multiple ends and answer issues of energy, comfort, livability, and security.
- Adopt cost-effective design measures that create real value for the occupants and owners.
- Pursue economically and technically feasible strategies for high-performance and high-density housing.
- Create pedestrian and child friendly environments.

- Engender supportive communities by integrating community resources into site designs and accommodating occupants needs, current and future, into building designs.

For the sake of clarity, project goals can be differentiated as globally or locally relevant. It is useful to define the project goals as being globally or locally relevant because of the inherently exploratory nature of this project. The SHA desires specific proposals for specific sites but also recognizes the unique opportunity to conjure a broad scope of possibilities for what public housing and market-rate housing can be, to inform the City of Salem’s outlook of housing over the next century.

Studio Methodology

To produce the highest quality of work possible, this two-term studio required a radical departure from the normal way an architecture studio is conducted.

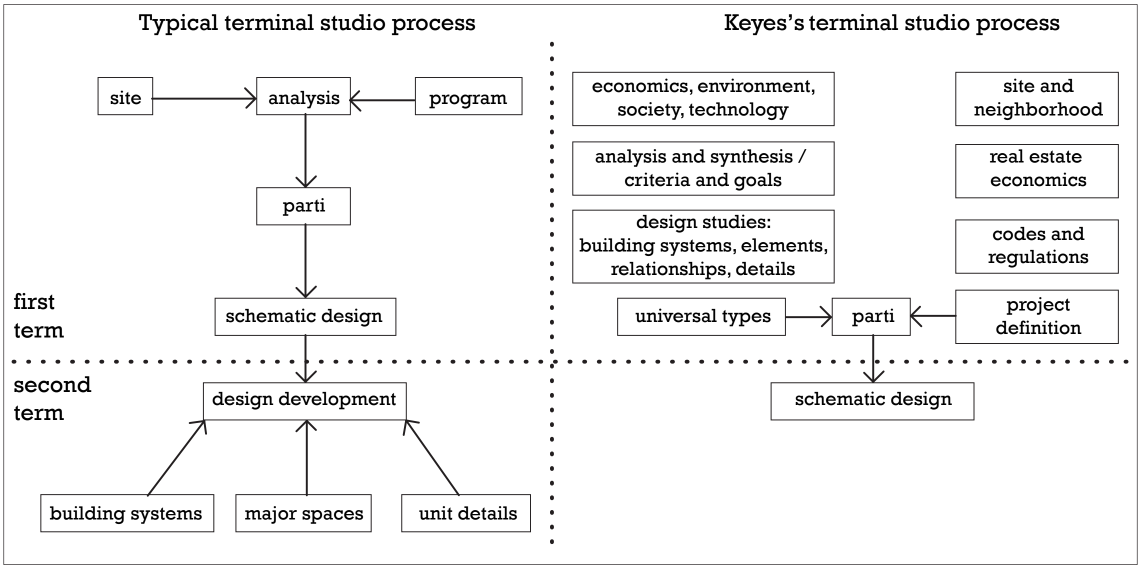


Figure 1: Diagram showing process of typical University of Oregon terminal architectural design studio, on left, and inverted process of Peter Keyes's 2011 Advanced Architectural Design Studio, on right.

The studio is organized around the principle that before one considers the design of the built environment, one must critically examine the contexts from which the design is realized. The translation of this principle into the organization of an architecture studio stemmed from Professor Keyes's understanding of the difference between students of architecture and seasoned professionals. Experienced professionals design housing that is informed by their previous successes and failures; they design from a working catalog of strategies that are then tailored to the particular site and project. Students, however, do not have these successes and failures to inform their designs. Because of their lack of professional experience, students tend to be more experimental and open to new ideas than professionals.

Professor Keyes has observed a pattern in the way architecture students design housing, which is characterized by designs overly concerned with site issues to the detriment of the quality of the housing unit. To counteract this tendency, the studio was organized in order to explore global contexts first. During the first term, the students developed prototypical room, unit, and building layouts and established a conceptual and analytical kit-of-parts, similar to the working catalog of design strategies that professionals implicitly use. The students explored how the relationship of rooms, units, buildings, and the land affect development economics, constructability, livability, household interaction, community interaction, thermal comfort, energy efficiency, spatial efficiency, microclimates, and stormwater management before applying these strategies to a specific site.

The kit-of-parts necessarily reflected the students' understanding of recent demographic trends. The students were not given a specific building program, so decisions about housing type, unit type, number of units, type of parking, and types of amenities or community spaces were made by the students themselves. In this regard, the students played the role of developer as well as architect. In direct contrast to typical market-rate developments, where first-day costs trump all, the studio emphasized a consideration of trends on the scale of 50 to 100 years and how the design of the room, unit, and building could respond to accommodate those changes.

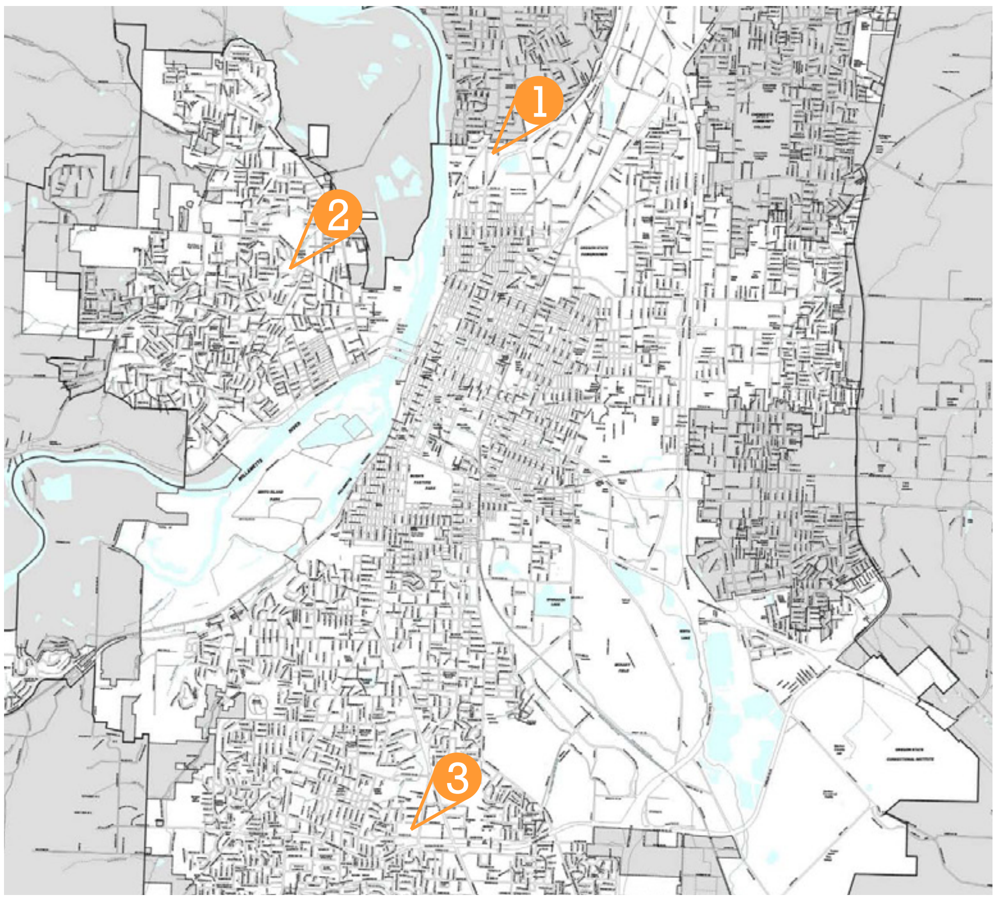
Weekly group critiques focused on analysis and execution of strategies, looking first at individual rooms, then individual units, clusters of units, buildings, and clusters of buildings. In the last week of the first term (almost halfway through the two-term studio), the students visited the SHA sites for the first time and proceeded to quickly explore schematic design alternatives on each of the sites. This organization allowed the students to design high quality housing units and prototype building designs based on an analytical understanding of their relationship to different possible local concerns.

During the second term, students continued to develop site-specific proposals for SHA multi-family properties. The students rigorously sought to balance the influence of global concerns while refining their designs to thoughtfully integrate local concerns.

The students' design proposals were presented for input to SHA representatives, city employees, local architectural professionals, developers, builders, and university faculty throughout the two-term design process.

Existing Site Conditions

The SHA currently owns or operates 646 housing units on 15 sites throughout the Salem-Keizer area, composed of 158 townhouse units, 390 apartments, and 98 single-family homes. In the second half of the studio, the students focused on three sites in particular: Orchard Village, Meadowlark Village, and Glen Creek.



1 orchard village

2.78 acres w/ adjacent commercial opportunities

30 units demolished due to mold & site safety concerns

2 glenn creek

~ 6.5 acres in suburban neighborhood on busy street

32 units existing on site; flood plain covers 1/3 of site

3 meadowlark

4.6 acres (1.6 acres undeveloped) adjacent low density res.

30 existing units on site : infill + renovation strategies

Figure 2: Map of Salem, Oregon showing existing SHA multi-family properties including Orchard Village, Glen Creek, and Meadowlark Village.

Orchard Village

Site Characteristics

The 2.78-acre Orchard Village property at the north end of Salem, near the City of Keizer, previously contained 30 public housing units. Neighboring the site are commercial and government buildings, low-density residential areas, and Parkway Village, another multifamily public housing development.

The site is accessed off Broadway Street, near public transit, and is tucked behind an underutilized two-acre plot of privately owned land along Broadway

Figure 3: Map of Orchard Village public housing site, located in Salem, Oregon.

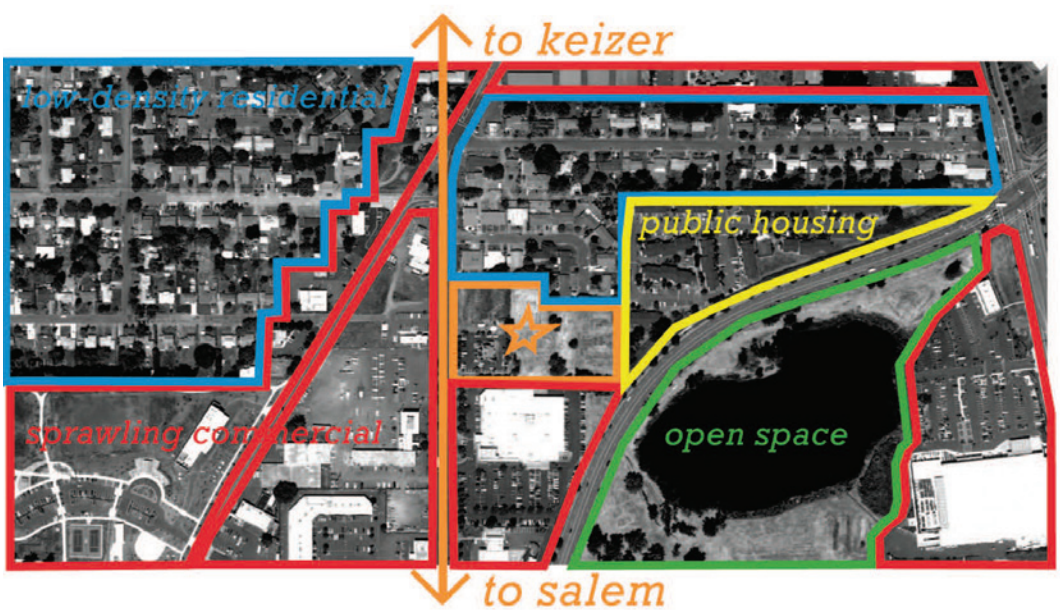


Figure 4: Map showing Orchard Village site and surrounding land uses.

Street. The SHA gave the students the option of incorporating this neighboring plot of land in their designs as an opportunity for a neighborhood revitalization project.

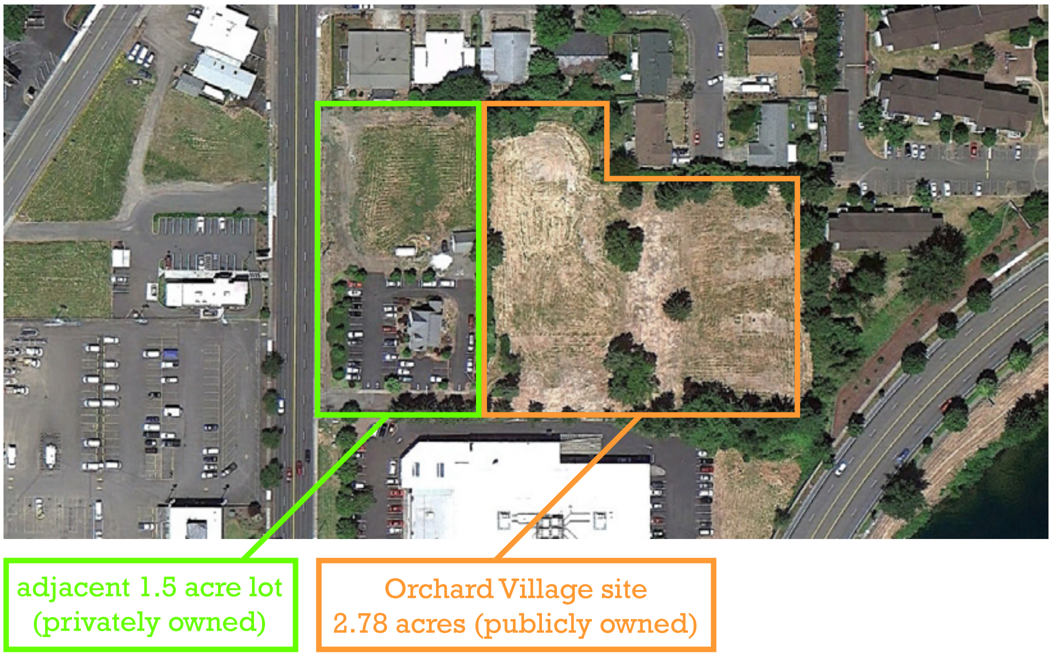


Figure 5: Map showing boundaries of the existing Orchard Village public housing site and adjacent 1.5-acre privately owned lot.

The site is currently accessed via a small easement at its south edge, with no formal access points at any other location. The east end of the site abuts Salem Parkway and the Salem Parkway Bike Path, sloping down significantly to the east. The roads surrounding Orchard Village to the east and west are high volume, moderate to high speed, and loud. Toward the north and middle of the site, noise is not an issue, because of the moderate berms at the west, south, and east edges of the site. Otherwise, the site is predominantly flat, with only a slight overall slope to the north/northeast.

The surrounding area is not particularly picturesque. There are limited views of the Cascade Range to the east and views of the retention pond on the other side of the Salem Parkway to the southeast.

In 2009, the 30 townhouse units on the site were razed due to water damage and indoor environmental quality problems within the units. There are only a few sizeable trees on the property, including some Oregon White Oaks along the south edge of the site. Invasive plants occupy the east and north perimeter, covering the existing chain link fence. Much of the site is currently covered in broken aggregate, the sparse remains of the previous development.

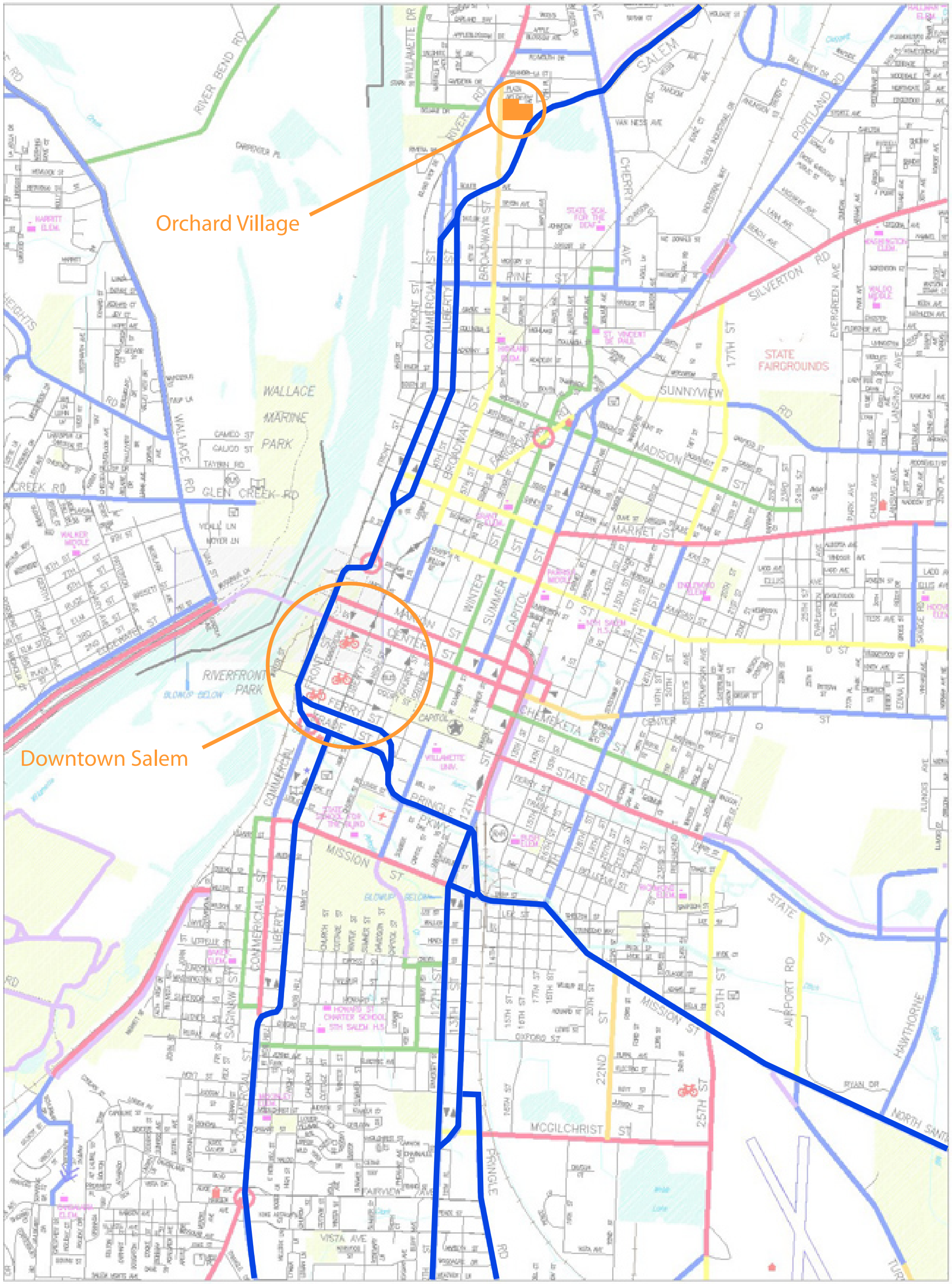


Figure 6: City of Salem Bike Map with Orchard Village site and Downtown Salem highlighted, Salem Parkway Bike Path and connecting bike paths are shown in blue.

Site Opportunities

- Significant reevaluation of site circulation and access is possible with new development, especially if the adjacent two-acre plot is included.
- Major east-west axis of the site supports the integration of passive solar strategies.
- Existing bus lines and neighboring bike path support the use of pedestrian and transit oriented development strategies.
- New development can capitalize on mixed use and mixed income strategies without disrupting neighborhood fabric because the site is sandwiched between commercial and residential areas.
- Infrastructure improvements, such as added traffic controls, pedestrian and bike friendly streets, and street trees, support increasing the density of housing on the site.
- Inventive stormwater mitigation and low-maintenance landscape strategies, such as bioswales, rain gardens, and native flora, can be implemented in conjunction with infrastructure improvements to reduce runoff, pollution, and water consumption.
- The relationship of the Orchard Village site to the adjacent Parkway Village public housing can be reevaluated in the design process to assess potential of establishing new physical connections between the two sites.

Passive Solar Strategies

“Passive solar” refers to the bountiful and free resources of the sun that a building can harness through appropriate design. Passive solar strategies reduce the need for cooling energy in the summer and heating energy in the winter, while providing daylight, access to views, and fresh air. Passive solar design centers around careful consideration of when and how the sun’s radiation enters the building. In a similar manner, passive solar design focuses on how the building, its spatial layout, and material composition interact with the sun’s radiation. While heady in concept, passive solar strategies can result in a reduction of the heating and cooling demand by as much as 65% in the Willamette Valley.

Meadowlark Village

Site Characteristics

This 4.6-acre property in south Salem is surrounded by residential areas on all sides and currently contains 30 units of public housing. Slightly further to the northeast, there is a sprawling commercial zone along Southeast Commercial Street. The site is accessed from the east, from Sunnyside Road, where a bus stop connecting Meadowlark Village to downtown Salem is located. The surrounding areas are car-centric, mostly low-density residential developments, including a mobile home park immediately to the south and a detached single-family residential neighborhood immediately to the north.

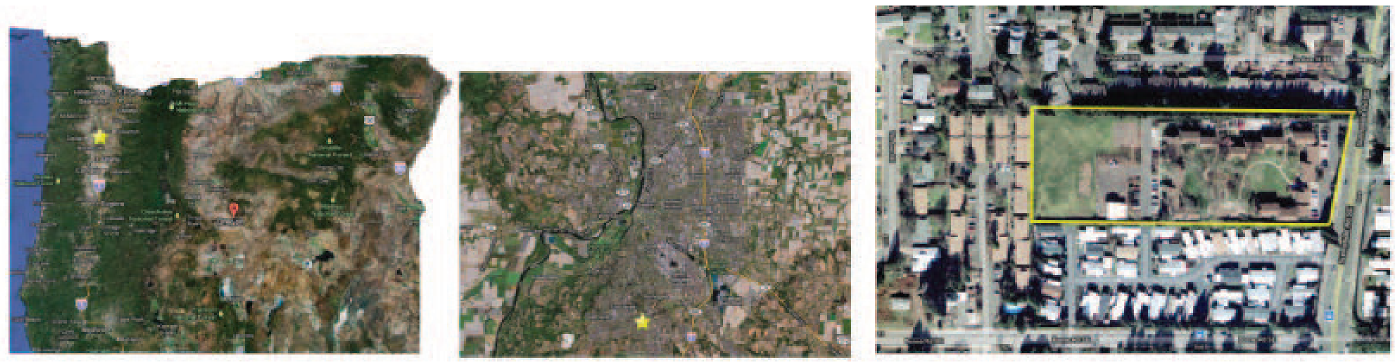


Figure 7: Meadowlark Village site located in Salem, Oregon.

There are 30 townhouse units currently on the site, composed of 22 three-bedroom units, six four-bedroom units, and two five-bedroom units. The existing housing is organized around a large courtyard with little to no private outdoor space. The courtyard is too large in relation to the surrounding buildings and number of residents. The layout of the courtyard and the landscape design does little to preserve privacy within the units themselves. Parking surrounds the existing housing to the west, north, and east. The complex has a foreboding, cold sense of arrival, resulting in an underutilized space at the entry of every unit and around nearly the entire perimeter of the site. Considering this layout, it should be no surprise that Meadowlark Village's relationship to its neighbors

Figure 8: View from Sunnyside Road of the entrance to Meadowlark Village (Google Street View, Aug. 2011).

consists of a seven-foot fence on all sides. Given this layout, the successful design of the interior of the site becomes all the more important.

At the west end of the site, there is an undeveloped 1.7-acre plot of land. The SHA wanted the proposals for this site to focus on infill development strategies and optimizing the use of the existing housing on site. The site is predominantly flat, with only a slight grade to the northeast. Despite surrounding local roads approaching the Meadowlark Village site, the only pedestrian access is to the east on Sunnyside Road where, although there is a bus stop, there are no pedestrian traffic controls.

Figure 9: Map of Meadowlark Village site and surrounding residential neighborhoods.

Site Opportunities

- Major east-west axis of the site and mobile homes to the south support the implementation of passive solar strategies.
- Distance of infill area from Sunnyside Road, and relation to surrounding neighborhoods, suggests inward-focused site response.
- Lack of pedestrian accommodations at Sunnyside Road and around the perimeter of the existing housing presents opportunity for infill development to propose new means of creating pedestrian and child friendly environments in a disconnected site.
- Infill site access limits potential uses to site-specific resources and presents opportunity to integrate localized community resource network or cohousing principles.
- The direction of the slope on site (down to the northeast) necessitates integration of stormwater mitigation to prevent runoff to the existing housing and courtyard.

Cohousing

Cohousing represents a particular way of understanding resource distribution networks within a small community. In cohousing, facilities are made available to occupants under a social agreement of shared ownership of and responsibility for the facilities. These community facilities exist apart from the occupant's private dwelling and often are designed to accommodate those functions of the home that occur daily as well as those that occur less frequently. For example, cohousing communities may have a large shared dining hall where occupants and families can elect to eat on any particular night, as well as guest lodging that is usable by all residents. When this is the case, the individual dwellings do not have as great a need for a large spacious kitchen or extra guest bedrooms. In public housing, cohousing principles can be used to maximize the utility of community resources so as to reduce the need for redundant facilities within the individual dwelling. Further, the focus on community interaction and positive community support engendered by cohousing works to reduce the demands on the individual living in public housing.

Glen Creek

Site Characteristics

An approximately 5.5-acre site in the northwest area of Salem, Glen Creek is in a suburban context surrounded by very low-density residential developments.

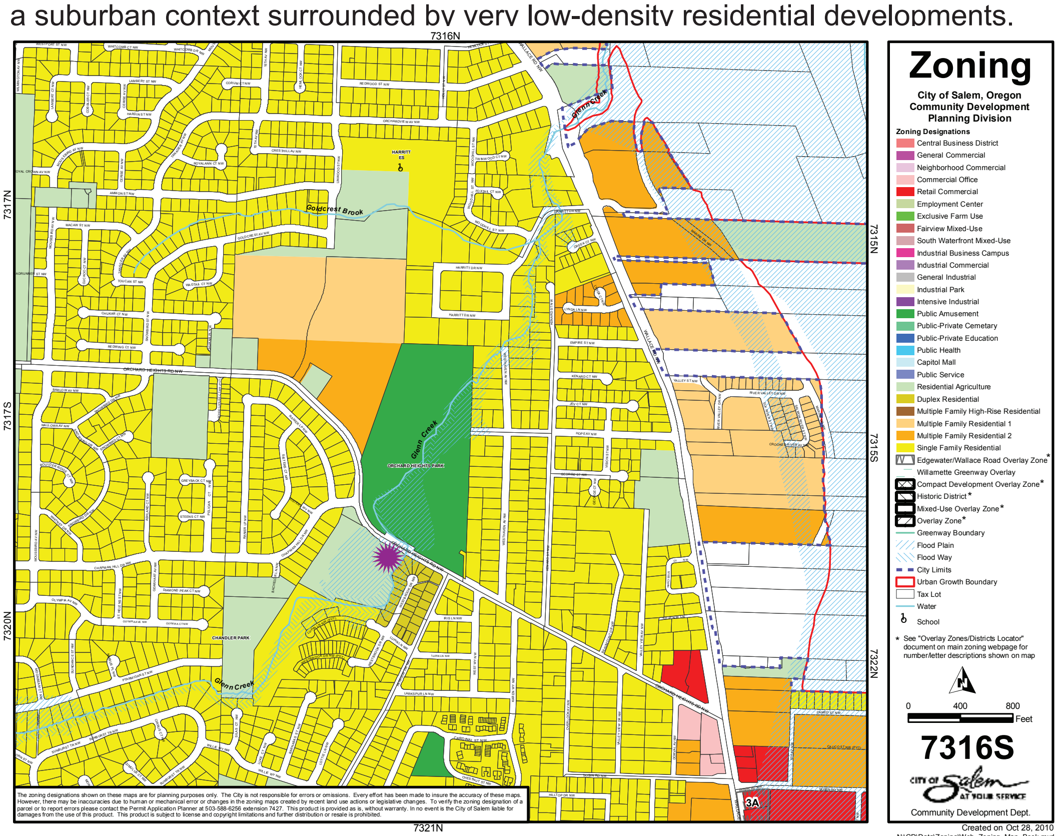


Figure 10: Zoning map of area surrounding the Glen Creek site, marked with a star.

There are isolated commercial areas along Orchard Heights Road to the north and east. The eponymous creek borders the east and south edges of the site; about one third of the site is in a floodplain.

The site is accessed from the north off Orchard Heights Road and is situated in the middle of a hill that slopes down primarily to the southeast. The existing 32 housing units on the site are arranged around the center of the site, where a potential courtyard space is located. The outdoor spaces on this site possess a character similar to that of the Meadowlark Village site, notably the contrast of over-emphasized parking areas and underutilized outdoor spaces.

At the southeast edge of the site, at the end of the entry road, is an SHA staffed office to support residents and potential tenants. The edges of the site have a decidedly natural feel as wooded areas create a transition between the developed area and the creek. These wooded areas are starting to show signs of being overwhelmed by invasive species, including blackberries, and, due to their significant slope, present few opportunities for landscaped spaces without significant intervention.

Figure 11: Image of the exterior of existing housing on Glen Creek site, taken from the parking area.

The location of this site amid market-rate suburban neighborhoods, near good schools, and with access to the creek makes it a very desirable plot of land for private developers. Public housing on this site is not seen as desirable by its neighbors. The SHA, however, seeks to increase the value and quality of public housing on this site, and wanted the students to focus on infill development strategies that optimize the use of the site and present new perspectives on what public housing can look like.

Site Opportunities

- Existing SHA office facilities on site allow for easy integration of additional community resources when density is increased.
- The natural character of the site allows for a robust relationship between outdoor and indoor spaces not typically found in public housing.
- Location of creek to the south suggests orientation of living spaces that open to south facing outdoor spaces and in turn supports the use of passive solar strategies.
- The presence of a creek on site increases the necessity of on-site stormwater management, especially of polluted runoff from roads and roofs.
- The site's location amid large, market-rate, suburban neighborhood supports experimentation with expectations of style and beauty in low-income housing.

Design Proposals

The overarching goal of the students' work was to elevate perceptions of what is possible in low-income housing, specifically in terms of livability, community interaction, dignity, beauty/aestheticism, performance/resource efficiency, and longevity. Further, these proposals can inform market-rate development as much as low-income, subsidized housing development because of the many similarities between the two. The students endeavored to design housing that is affordable to build and that people would want to live in, something any housing development also seeks to achieve, but were not willing to sacrifice quality of life for the occupants in return for expediency or profitability. While cost-cutting, value engineering, and half measures of design understandably plague housing of all types, given the large amount of unpredictability inherent in any building project, this need not be the norm.

Many of the proposals that follow are a result of the belief among the students and the design faculty at the University of Oregon that we cannot afford to continue developing housing in the short-sighted manner of the last few decades if we are to begin to address the looming issues of climate change, urban/suburban sprawl, and the current economic uncertainties surrounding housing. The students worked in acknowledgement of the seriousness of the act of building, both environmentally and economically, privileging the long-term quality and value of the structure over short-term interests such as first-day costs and first-day profits. The students sought to take advantage of the responsiveness of markets to consumer needs and tailored their designs to accommodate the needs of people and families living at higher densities in order to achieve marketability.

In the most straightforward way, the students worked with an understanding of the impact of design on the building operations budgets of the SHA and its clientele. An energy efficient, well-detailed, durable, and resilient building costs less to own, maintain, and live in. This fact is pertinent to all housing, but the benefits of designing housing with this understanding of value can be realized most fully in public housing, where long-term ownership and public accountability allow for greater focus on the life-cycle costs of the building. More fundamentally, the most sustainable building is one that lasts the longest and proves useful well into the future. The students' work diverged most in their individual interpretations of these concepts.

Multiple strategies, at times working towards the same ends, are executed in different ways throughout the students' work, as there is no one catch-all solution. Rather, these design proposals are meant to explore areas of coalescence where multiple strategies work together to result in otherwise unrealized value for the occupant, property manager, and owner. Each of the following sections represent convergent themes in the students' work but will also highlight complementary strategies at the room, unit, building, and neighborhood scale.

Global Recommendations

The students' proposals, while displaying a wide range of interpretations of how best to address the current and future needs of the SHA, were grounded in big ideas that formed the basis of how their designs evolved. The big ideas can be understood as global recommendations to inform the design of housing in general.

The global recommendations emerged as a result of research the students conducted under the guidance of Professor Keyes during fall term of 2010. Their research ranged in scope and examined, among other topics, the role of technology in changing patterns of household activity, how high-density housing can accommodate the emotional and physical needs of suburban residents, the potential of residential solar power in Oregon, how green building certification programs address or ignore the relationship between development pattern and carbon footprint, and the latent food production potential of existing and infill developments. While the students' individual research informed the studio as a whole, this section will focus primarily on the students' design work produced during the winter and spring terms of 2011.

Each of the following global recommendations were guiding principles in the students' work, intending to address the specific needs of public housing and the burgeoning needs of American housing in general.

- Promote sense of dignity, identity, and ownership.
- Implement passive design strategies.
- Design resilient housing (Future-Proof building).
- Build high-performance housing.
- Integrate local food production networks into public housing.

The underlying impetus of each global recommendation involves the creation of real value in the built environment. In addition, each global recommendation exists in the context of high-density developments using low-rise (less than four-story) buildings.

For the SHA, following these global recommendations means creating housing that lasts longer, performs better, costs less to operate, costs less to live in, and instills confidence in its residents; it means sites that are safer to live on, provide more housing opportunities, make better use of open spaces, create pedestrian and child friendly environments, and accommodate a growing population using existing residential land.

Promote Sense of Dignity, Identity, and Ownership

Caitlin Gilman's design recommendation is a response to the idea that by engendering a sense of ownership, identity, and dignity in the occupants of low-income housing, value will be embedded into the structures by virtue of the

Figure 12: Exterior view showing typical unit and outdoor patio/parking space (Caitlin Gilman).

residents' emotional connections to the place. If it is a place that people call home, a place that is beautiful, a place where people want to be, then people will take care of it. Such humanitarian design is pertinent for the SHA, especially considering how popular opinions of low-income housing hold it in low esteem, like market-rate housing but built even more cheaply. This is apparent in the fact that throughout the design process the students encountered individuals who levied critiques of their work summed up thusly: "…it is too nice for public housing." To make such a statement is to condemn low-income residents as unworthy of the dignity of decent housing. More importantly, it represents an antiquated way of thinking, one that says that nothing in public housing can be as good as anything in market-rate housing.

By necessity, these proposals cast aside that preconceived notion about public housing, and, in turn, cast away preconceived notions about the relationship of low-income individuals and families to society as a whole. The scale and form of these designs intentionally refer to an identifiable symbol of American pride, the single-family home.

They use a similar visual language of elements that describe the composition of a home – a front porch, a welcoming family area, and an area to call one's own. Within each proposal however, we can see a thoughtful reevaluation of how these parts fit together to make the home and the community, particularly in the outdoor areas created between individual residences.

Figures 13 and 14: View showing garden places for solitude in courtyard and view showing garden place for group gathering in courtyard (Eleni Tsivitzi).

In her proposal, Eleni Tsivitzi created residences organized around a shared courtyard offering different opportunities for neighborly interaction and activities such as gardening, cooking, and playing. Interior living spaces and kitchens open onto the courtyard. Individual residences are punctuated with trellises that define the threshold between private space and shared, public space, further emphasizing the role of the courtyard in organizing the design. A sense of place was established through the creation of graceful entry sequences, elevating the process of arriving at home and making it easy and safe to walk or drive in from the street. The rituals of modern daily life were re-examined in this manner, and an attempt was made to bring beauty and dignity to each of them.

Figure 15: View showing community outdoor space and exterior of cottages (Andy Drake).

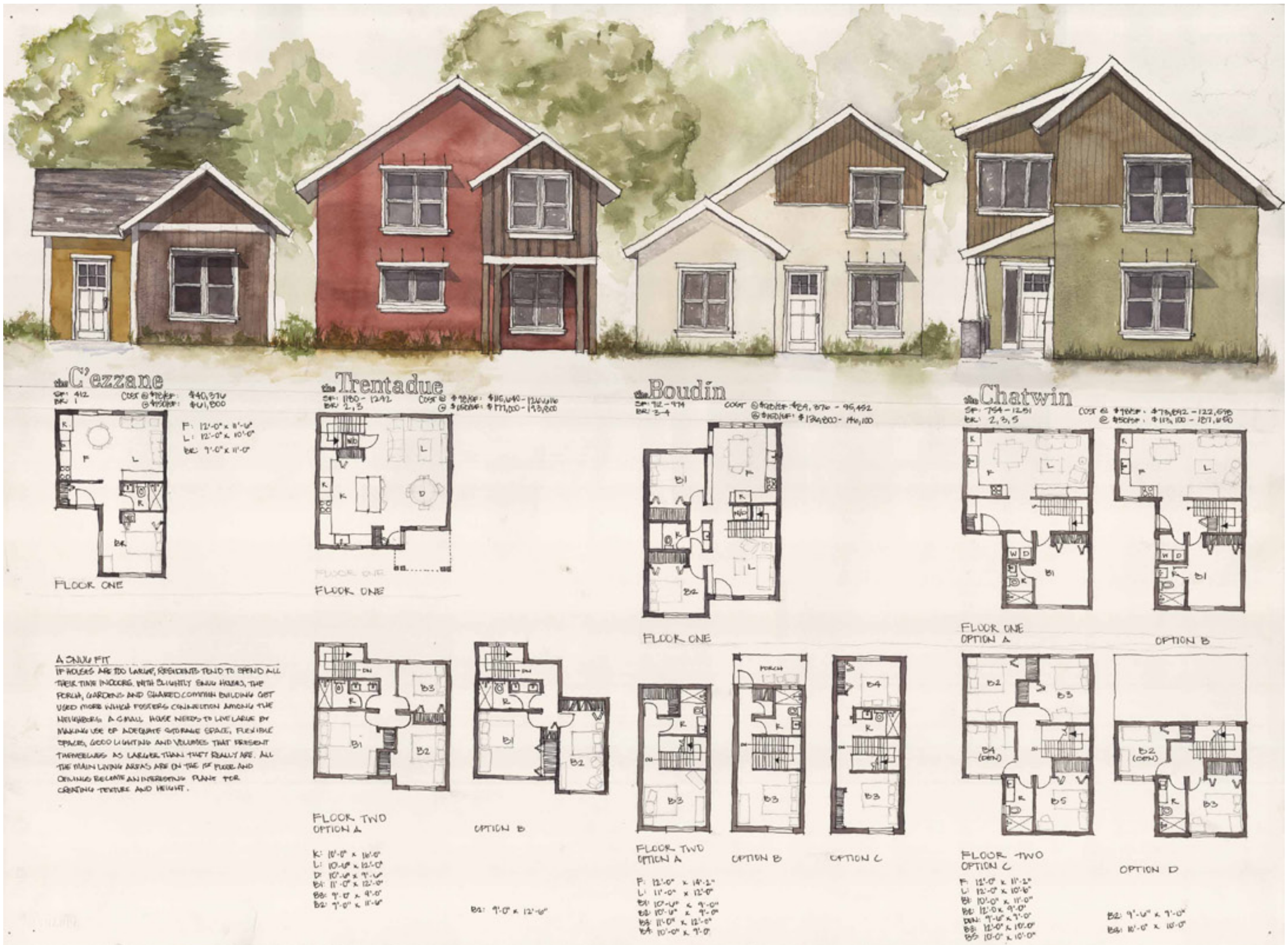


Figure 16: Cottage Unit Types showing plans and exterior elevations (Andy Drake).

Andy Drake's proposal for the Meadowlark site similarly embraced the value of promoting a sense of dignity, identity, and ownership using the timeless form of the cottage as a symbol of his intent. The front porches and simple forms of the cottage remind residents they live in a home rather than a public housing unit. Varying the exterior of the cottages, in both color and form, embeds in each dwelling a unique identity – residents won't need to say, "I'm in unit number 17a," but rather "my home is the red one with the front porch." In turn, he created a place that many would be proud to call home. In keeping with the mission of the SHA, the home itself needed to be at the confluence of affordability and everyday beauty. This is accomplished through a concise material palette that lends itself to great variation on the exterior, including wood paneling, textured concrete, and vibrant colors, and functional built-in elements on the interior to break up the monotony of the white gypsum box.

Despite the use of typically suburban architectural styles, there has been no sacrifice of density, privacy, relationship to neighbors, or relationship to the city. Quite the contrary, these proposals make more efficient use of the land and create positive community spaces that enrich the lives of the occupants. A common thread at the site scale is the use of pocket neighborhoods to support increasing density and to engender community interaction. This can be seen in both Eleni Tsivitzi's and Andy Drake's implementation of smaller scale clusters of residences than is typical of other SHA multi-family properties, at average densities of 18 units per acre and 16.9 units per acre, respectively. In addition, these proposals provide a useful example of appropriately scaled outdoor spaces at the heart of the pocket neighborhoods concept.

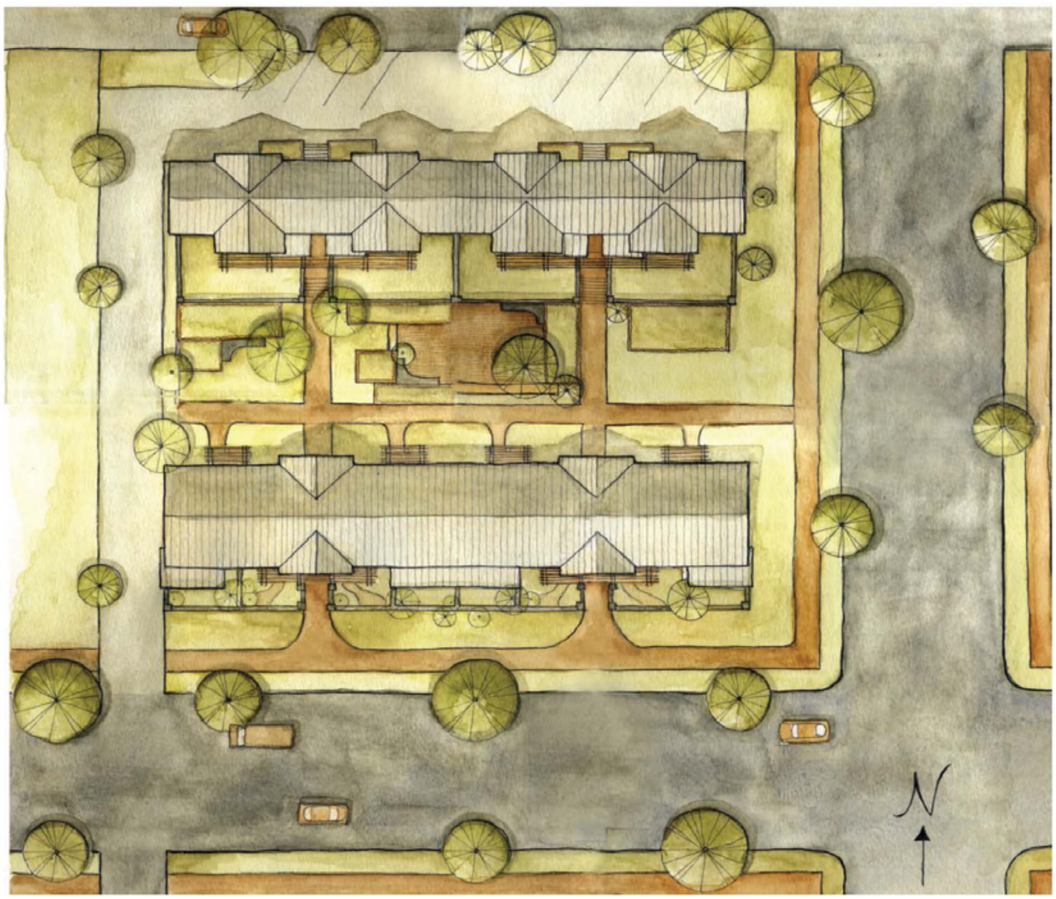


Figure 17: Prototypical site plan on an urban half-block showing courtyard and surrounding 12 units (Eleni Tsivitzi).

Pocket Neighborhoods

Pocket Neighborhoods represent an approach to organizing dwellings on a site to create positive neighborly interactions. A pocket neighborhood is “a cohesive cluster of homes gathered around some kind of common ground within a larger surrounding neighborhood” (Chapin 2011). At the crux of this design strategy is a shared outdoor space. “The residents surrounding this common space share in its care and oversight, thereby enhancing a felt and actual sense of security and identity” (Chapin 2011).

“It’s as if we were at a dinner party. The table is large enough for 10 to 15 people, and there are multiple conversations happening. Each of these conversations is a cluster, naturally formed into optimally sized groupings. When the group is too large, the conversation becomes quite difficult.” - Andy Drake, architecture undergraduate.

Figure 18: Exterior view showing site plan and outdoor spaces on the Meadowlark Village site (Andy Drake).

In another incarnation of this recommendation, Peter Hanley's proposal for the Meadowlark Village site includes 23 single-family homes. The compact scale and layout of these homes creates a tightly knit community where individual identity and ownership are preserved. The homes range in size from 900-square-foot, two-bedroom to 1,340-square-foot, three-bedroom, each with a semi-private outdoor patio, 1.5 parking spaces, a private roof deck, and many of the other amenities typically enjoyed in single-family housing. These are family homes, with an emphasis on design that accommodates positive family interaction. Sleeping spaces are kept to a small footprint and provide adequate storage, while activities such as play or work on a computer are pulled into the public realm of the family. Circulation is kept to a minimum in Hanley's design, but is treated in such a way that activities take place directly off the circulation, so as to make better use of the space.

On the site scale, Hanley's design augments the concept of a pocket neighborhood by focusing on different scales of infill developments – starting at a two-unit infill strategy and building up to larger scale strategies. The compact design and simple form of these units facilitates affordability, and when implemented at the moderate densities he proposes, stands to offer a great infill development strategy.

Figure 19: Exterior view of two-unit infill development on typical suburban Salem lot (Peter Hanley).

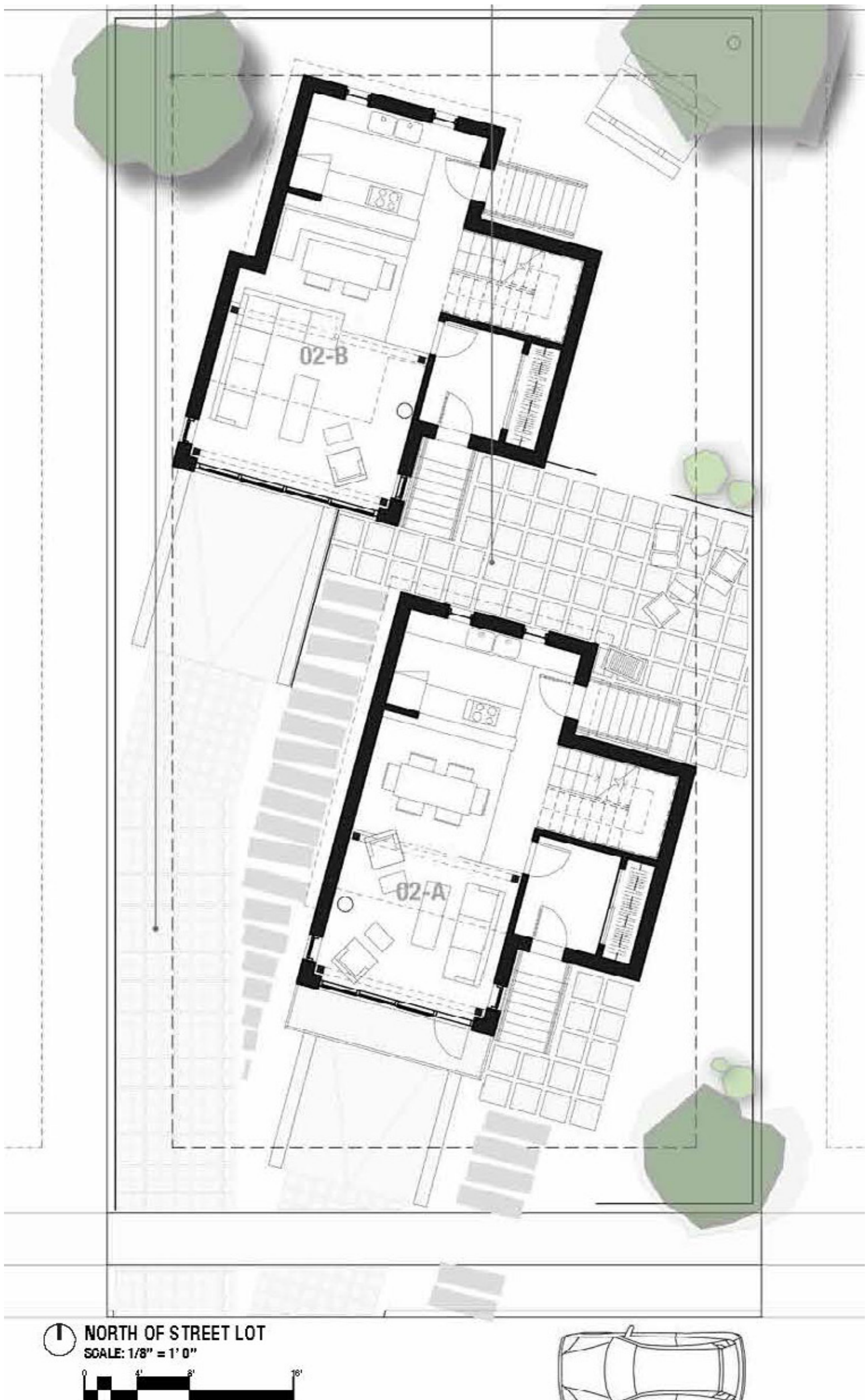


Figure 20: Ground floor plans of two-unit infill development on typical suburban Salem lot (Peter Hanley).

Implement Passive Design Strategies

Before energy efficiency even comes into play, passive design optimizes the use of assets available to all types of housing – light, views, and air.

Figure 21: View from entry loggia showing layers of thermal, acoustic, and privacy controls (Shane O'Neil).

Figure 22: View of unconditioned interior courtyard with polycarbonate roof to diffuse daylight, minimize glare, and reduce heat loss in conditioned spaces (Caitlin Gilman).

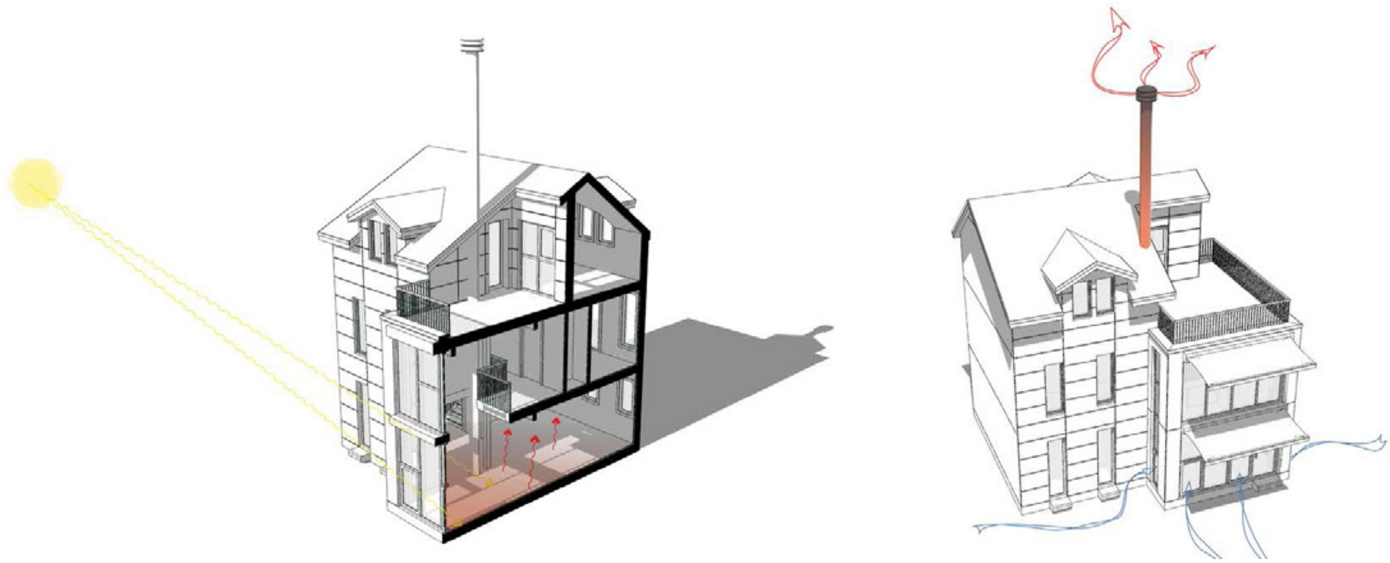


Figure 23: Passive solar heating and cooling diagrams (Peter Hanley).

In Pacific Northwest construction in general, proper attention to solar orientation, seasonal shading, daylighting, natural ventilation, unit and building layout, insolation (direct solar radiation), and insulation will enhance occupant comfort, improve indoor environmental quality, and greatly reduce the need for mechanical heating or cooling. All of these strategies are low-cost and low-tech, but at times design-intensive. All of the students' design proposals integrated these strategies from the beginning of the design process, and as such they represent a baseline of energy performance in the students' work. None of the students' design proposals include active cooling (air conditioning systems) as a result.

In the Pacific Northwest, residential energy demand is very high and thermal comfort is difficult to achieve, despite this being one of the most hospitable climates for passive design. When given their due diligence early in the design process, passive design strategies can work together to greatly decrease energy demand and make thermal comfort easier to achieve.

Housing Type

Housing type affects energy performance in a fundamental way. Attached housing has fewer exposed surfaces than detached housing, resulting in a lower need for heating and cooling energy. Vertically stacked housing further reduces heating demand by reducing heat loss through the roof, one of the most conductive surfaces in a building. Smaller units require less energy than larger units, since there is less space that must be conditioned.

It follows, however, that fewer exposed surfaces means fewer opportunities to access solar radiation, air, light, and views. The design of attached, compact housing thus requires more effort in the design phase to optimize livability and energy performance.

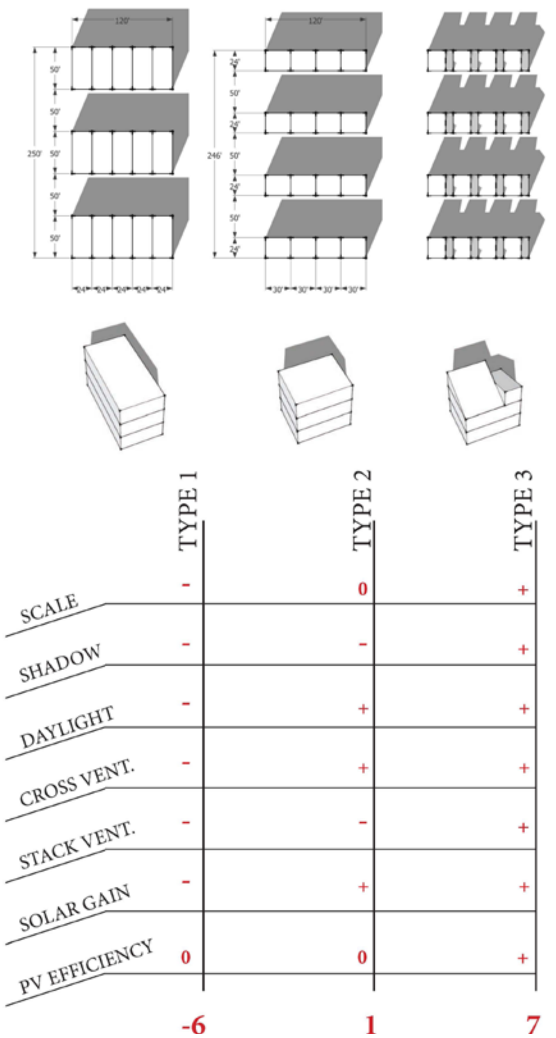


Figure 24: Unit type and environmental response comparison, showing impact of unit/building size and arrangement on potential passive design strategies (Wei Yan).

Passive design strategies, when viewed through this lens, are site-driven. The orientation of the sun, prevalence of wind, direction of wind, presence of pollution (air, noise, and light), and access to the elements (wind, sun, and water) determine the applicability of an individual strategy.

A large part of the equation in passive design is the housing type, which is often decided by the developer before an architect even begins to design. The students, being free to design toward a well-conceived goal, analyzed multiple different unit, building, and site layouts throughout their design, ultimately choosing those that best suited their design intents. As such, the students' proposals display a range of housing types, from detached single-story housing to multi-story attached housing.

Wei Yan took full advantage of this opportunity and rigorously analyzed the relationship between

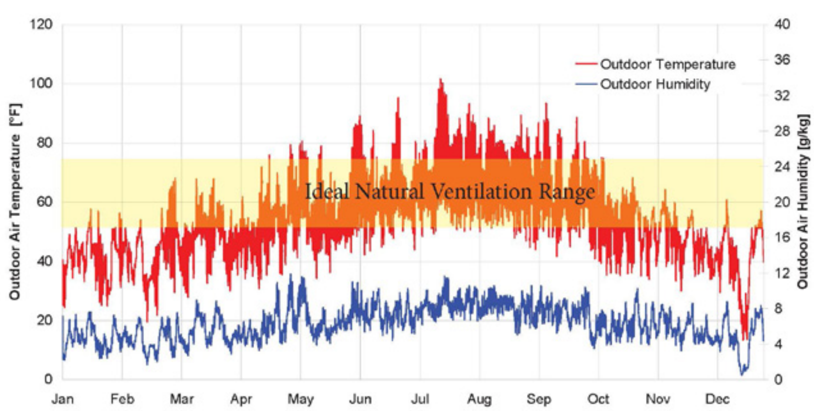


Figure 25: Chart displaying natural ventilation range in Salem (Wei Yan).

housing type and environmental response. By beginning with this sort of analysis, a clear understanding of what housing type best suited her intents resulted. Prioritizing daylighting, natural ventilation, insolation (direct solar gain), and potential for photovoltaic energy efficiency, Wei Yan chose a modified three-story row house typology. Careful attention was paid to the scale of each unit (30 feet wide and 24 feet deep) and the articulation of the roof and exterior walls to accommodate natural ventilation and passive heating. To further capitalize on the density and energy savings that can be achieved using a row house typology, two-story three-bedroom units were stacked on top of single-story two-bedroom units and all are entered from the ground floor.

Figure 26: Wei Yan's proposed Meadowlark Village site plan and unit plans.

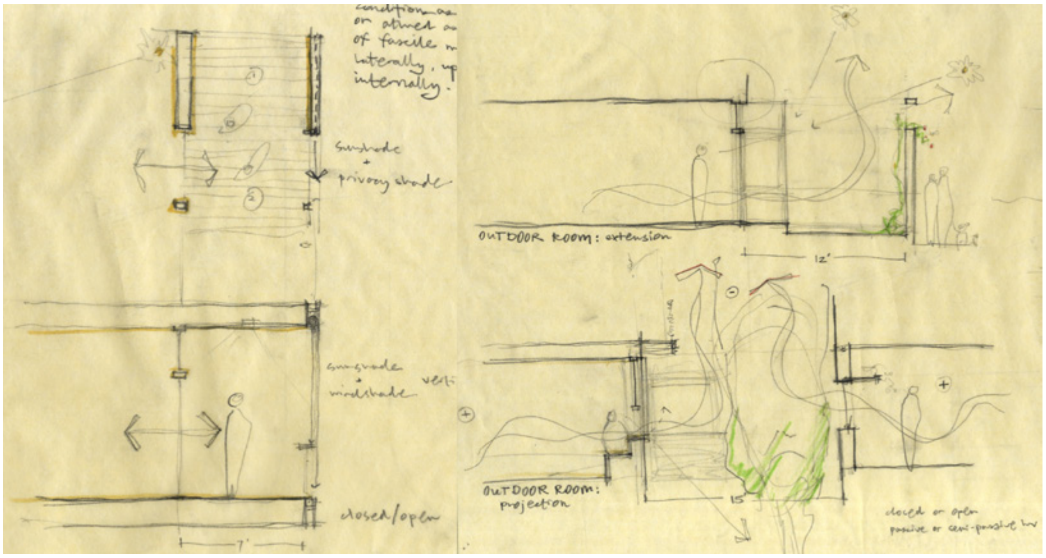


Figure 27: Sketch diagrams exploring relationship between, and microclimates of, indoor and outdoor rooms in different configurations (Shane O'Neil).

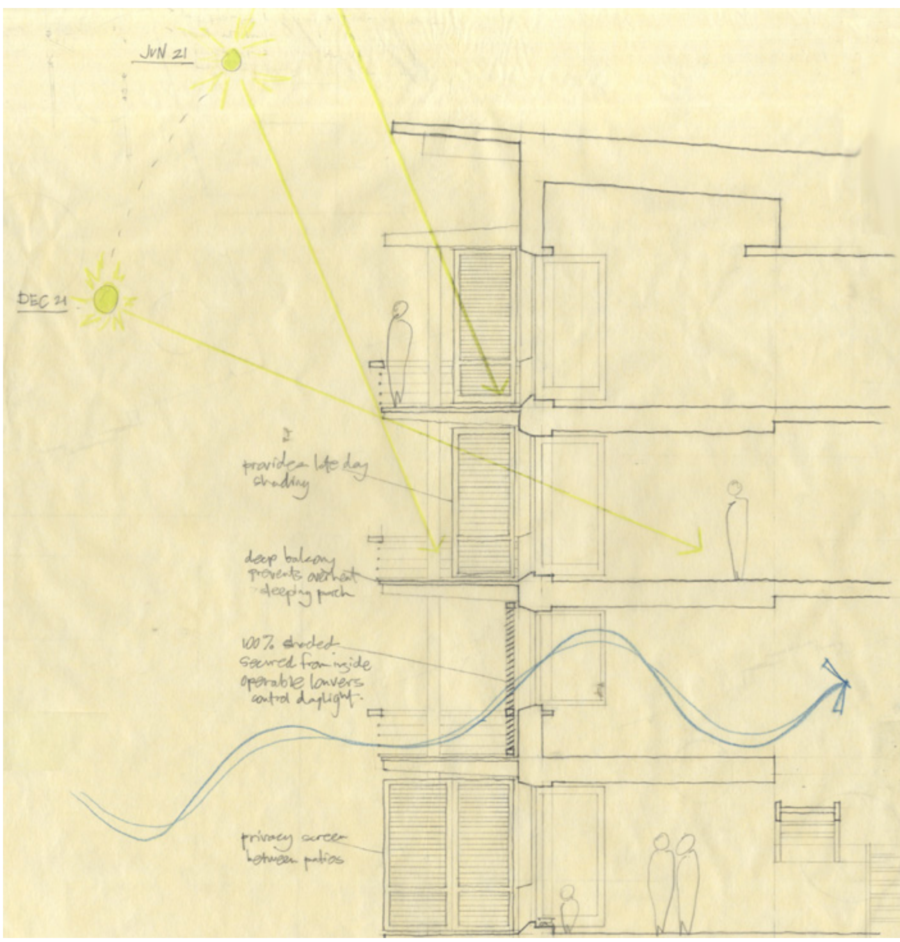


Figure 28: Schematic cross-section of the south façade of a four-story row house showing seasonal shading, ventilation, security, and environmental control strategies (Shane O'Neil).

At the room scale, the students paid particular attention to the means through which air, light, heat, sound, smell, and views are let into the space and how they support the activity within the space. This can be seen in Shane O'Neil's process work, shown in Figure 27, where the threshold and relationship of indoor and outdoor rooms was examined in detail. This exploration, done in the formative part of the design process, cemented into the project a consideration of the effect of microclimates on indoor and outdoor comfort, specifically as they result from the scale of building massing and relationship to the landscape.

In later iterations, and ultimately in Shane O'Neil's final proposal, this consideration of the effect of microclimates led to the creation of an unconditioned layer of indoor/outdoor space that acts as the vertical circulation and entry loggias for each unit. To ensure occupant comfort, multiple layers of thermal and environmental control allow for the occupant to decide how much light, air, and noise they wish to allow in and out of the loggia. This allows the

Figure 29: Cross-section perspective through unconditioned entry loggia, living spaces, and sleeping spaces (Shane O'Neil).

space to be used comfortably year-round, as it prevents rain and winter winds from entering the space. In addition, the unconditioned layer provides solar shading and acts as a thermal buffer for the adjacent living spaces, further increasing occupant comfort and reducing energy demand for heating and cooling within the unit.

In addition to decreasing energy consumption and making optimal use of light, air, and views, these strategies influence the relationship of residents on an individual site and can work to mitigate the perceived negative side effects of high-density housing. Noise and privacy issues are two oft-cited concerns about high-density and multi-family housing, so in pursuit of maximum livability at higher densities, a passive design mentality aligns the intent of the designer with the desires of the occupants.

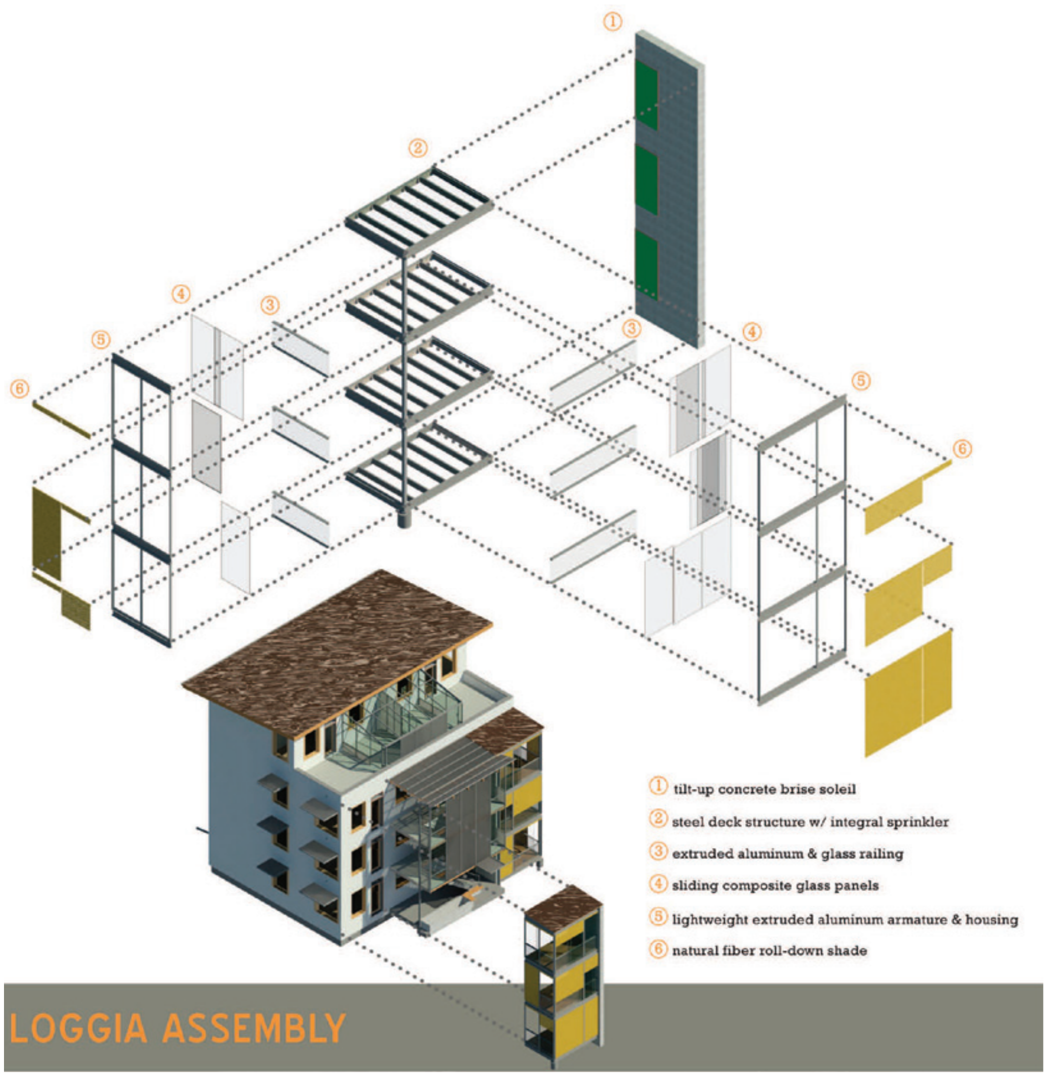


Figure 30: Diagram showing loggia assembly and layers of thermal and environmental control using occupant-controlled roll-down shades, and sliding composite glass panels (Shane O'Neil).

Recognizing the benefits of creating comfortable unconditioned spaces in Northwest housing, Elise Mandat explored this strategy in her proposal, focusing on seasonal, rather than daily adjustments to the spaces. The unconditioned outdoor room thus became more private, tucked away from the entrance and facing south, with two distinct conditions – open (warm and dry) and closed (cold and wet). Polycarbonate panels, which have small but important insulating properties, are secured to the structure on hinges and enclose the outdoor room. These panels can then be opened fully in the summer for natural ventilation, which is aided by a small vent grate located along the threshold between the outdoor and indoor room. In the winter, the polycarbonate panels will be fully closed, allowing light but not wind to pass through. This seasonal change makes the enclosure function as a double-envelope, increasing the insulation value of the wall assembly and reducing air infiltration. By pulling apart these layers of the enclosure and preventing rain and wind from hitting the side of the building, the building will last longer without deterioration and the need for replacing siding or windows will be reduced throughout time.

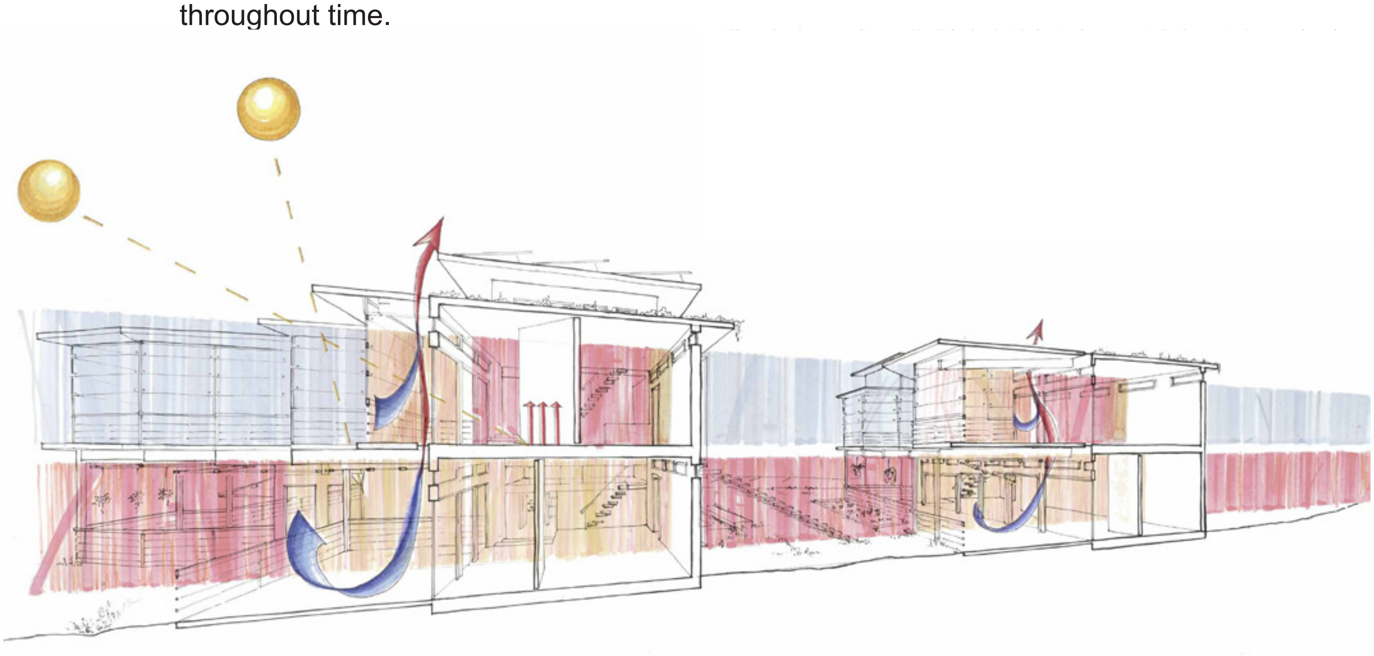


Figure 31: Diagrammatic cross-section through housing units showing seasonal shading, ventilation, and passive heating strategies (Elise Mandat).

Caitlin Gilman's proposal for the Orchard Village site provides another example of how passive design can work to reduce energy consumption and increase livability. The unit is a 20 foot wide by 55 foot deep row house with a central unconditioned, enclosed courtyard. The courtyard acts as the main entrance for the unit, but is essentially an extension of the living spaces on the first floor. The roof of the courtyard is clad in polycarbonate panels, which distribute solar radiation and daylight evenly throughout the space. The conditioned spaces are

Figures 32 and 33: Views showing seasonal character of unconditioned outdoor room – open (warm and dry) and closed (cold and wet) (Elise Mandat).

thermally buffered by the courtyard and will therefore experience less unwanted heat loss/gain and require less energy to provide thermal comfort. In the summer, when cooling is required, the courtyard can provide stack ventilation and aid in the ventilation of the other living spaces. In addition, the courtyard provides increased access to daylight in the conditioned spaces, decreasing reliance on electric lighting and reducing energy consumption.

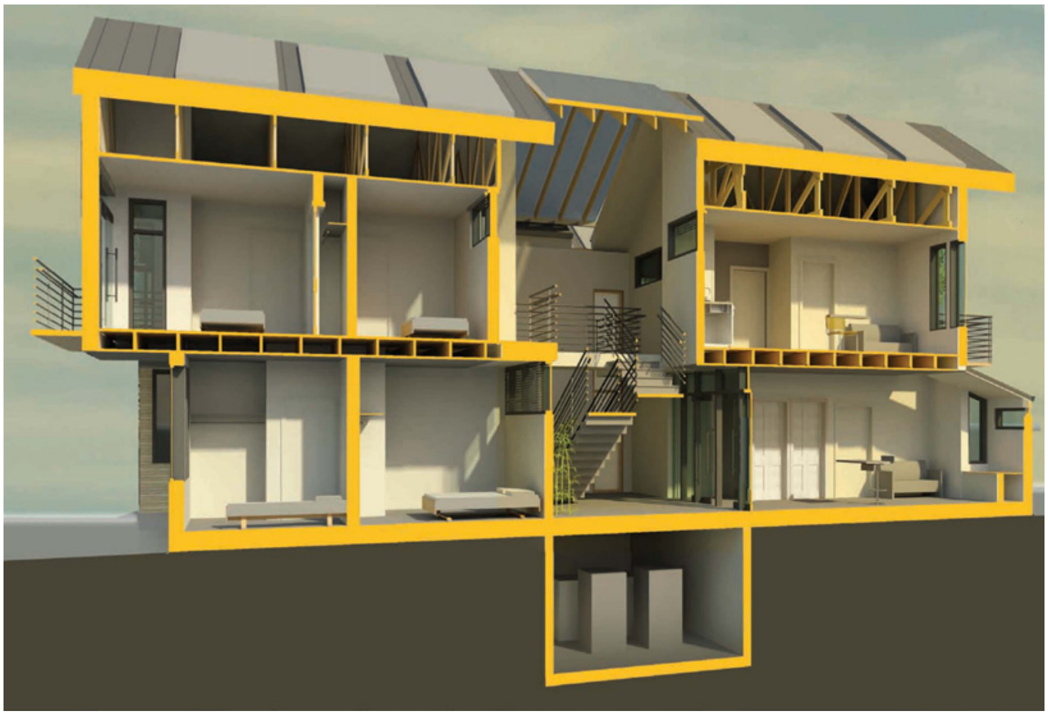


Figure 34: Cross-section perspective of typical unit showing unconditioned courtyard (center) and conditioned living spaces (Caitlin Gilman).

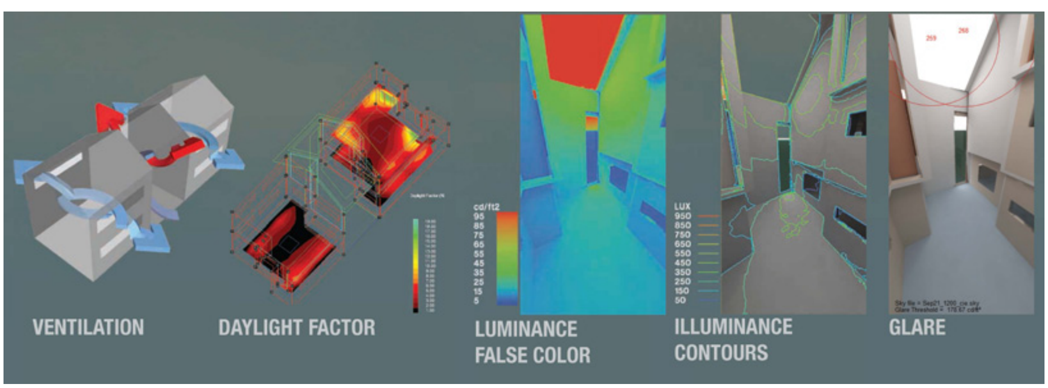


Figure 35: Diagram showing proposed passive cooling strategy through natural ventilation of the unit and analysis of daylight distribution and glare in the courtyard (Caitlin Gilman).

Erin Upham's proposal provides an example of integrating multiple passive strategies that increase livability and create a dynamic indoor-outdoor relationship. The proposal revolves around creating housing that accommodates food production and makes optimum use of the land. The housing itself is designed to make optimum use of the available resources, including energy, water, light, views, and air. The unit design places a flexible-use, unconditioned sunspace on the south edge of every floor that can be completely closed and opened to the living spaces and the outdoors. The sunspace creates a thermal buffer that helps regulate the temperature of the adjacent living spaces. When heating is needed, the sunspace can be partially opened to the living spaces to allow collected solar radiation into the unit. When cooling is needed, the sunspace can be completely opened to the outdoors, thus acting as an outdoor space and reducing heat gain in the adjacent living spaces. When naturally ventilating, the sunspace can be opened fully to extend the living space into the outdoors. A similar strategy is applied to the stairs within the unit, wherein the volume of the stair is enclosed and fully glazed. This allows the stair tower to act as a solar collector and thermal buffer zone. In addition, a large concrete cistern

Figure 36: Cross-section view through south façade of row house, showing layers of sunspaces, shading strategies, and garden spaces (Erin Upham).

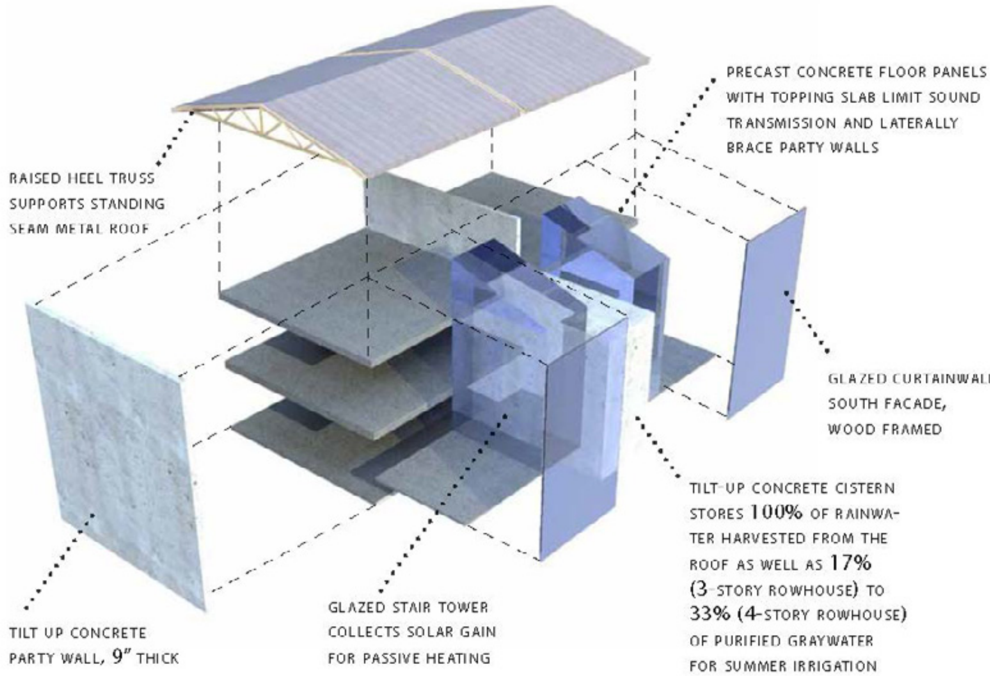


Figure 37: Diagram showing passive strategies and row house massing, including use of tilt-up concrete panels for thermal mass, acoustical separation, and rainwater storage (Erin Upham).

adjacent to the stair tower stores 100% of the rainwater from the roof and can be used to recycle and store graywater for summer irrigation. The cistern is located between adjacent row houses and constructed of tilt-up concrete, providing acoustic and visual privacy between neighbors. These strategies are supplemented by ample exposed thermal mass within the unit, allowing night ventilation of thermal mass to offset the summer and fall cooling loads and enough solar radiation to be stored throughout the day to substantially offset the heating loads, increasing occupant comfort in the winter and spring.

Future-Proof Building

The act of building is no small matter. It is energy, resource, and capital intensive, and can permanently alter ecosystems and social networks. Ensuring the longevity of the building is the most effective way to minimize the impact of this act. A main task of the architect, in a world ever more concerned with resource conservation and efficiency, is to design buildings in such a way that as many occupants as possible are served throughout the life of the building.

Future-Proofing seeks to capitalize on the latent potential of a building to adapt. In pursuit of a more sustainable model of building, the dimension of time is paramount to design. Designing with an awareness of the dimension of time means not only planning how a building can change in response to future needs, but also planning how it stays the same.

It is important to satisfy the immediate needs of the building owner and its occupants, but it is equally as important to consider how these needs will change throughout time. Demographics shift constantly, and housing must be able to shift with them. Tearing down obsolete complexes in order to build new, more relevant housing models is environmentally damaging and economically unsustainable. A Future-Proofed building is one that is designed to accommodate different expected occupancy patterns over time. Different families and family types inhabit space differently, and in recognition of this simple truth, Future-Proofed housing strives to accommodate their needs.

In owner-occupied housing, Future-Proofing strategies help to reduce the economic burden on a household when new needs arise, such as welcoming a new child or seeing the kids off to college. In a renter-occupied scenario, Future-Proofing maximizes the owner's ability to cater to the needs of the market and increases the livability of the unit. When implemented in new or infill developments, resilient design strategies work to make the most of the development and design of the urban environment (streets, sidewalks, public spaces, parking) by allowing the layout of the building in relation to the urban environment to remain essentially constant throughout time.

Designing for resiliency does not mean completely changing the way we build. It does mean, however, critically examining commonly accepted building practices down to the smallest details. The direction of floor framing, the alignment of studs in a wall, and even the location of electrical receptacles can all contribute to or preclude a building's ability to adapt. Other considerations, including the layout of the living spaces in relation to the sleeping spaces, the stairs in relation to the entry, and the proportional relationship of rooms in general, allow the building to be modified easily to support changing needs.

In recognizing the ecological, economic, and environmental benefits to density, the students were confronted with the unique issue of how to create resilient housing when space is at a premium. In order to sell high-density living, the housing stock must offer the same adaptability and potential for growth that single-family detached homes can provide.

Figure 38: Floor plans of three units, showing different occupant/family types and unit arrangements (Caitlin Gilman).

Figure 39: Diagram of how the form of the Split-Shift housing type responds to the need to design resilient housing (Caitlin Gilman).

Design Resilient Housing

Caitlin Gilman's proposal hinges on the necessity for resilient housing, and the form of her design responds accordingly, providing for a range of different occupancy patterns. She envisions a hybrid housing type borrowing from the historically most resilient housing types – row housing, courtyard housing, and single-family detached housing. Aptly coined Split-Shift housing, a courtyard is contained between two "detached" buildings, as Figure 38 shows. The whole assembly can function as a traditional row house, with a private entry courtyard uniting the "detached" buildings into a single-family home, or a myriad of different combinations of smaller units where the semi-public entry court serves multiple households.

Shane O'Neil's proposal for the Orchard Village site seeks to design resilient housing that is supported by a vibrant, interactive, and dynamic urban environment. The design is organized at the building scale around a unit whose boundaries can be re-drawn within the same overall building massing to create

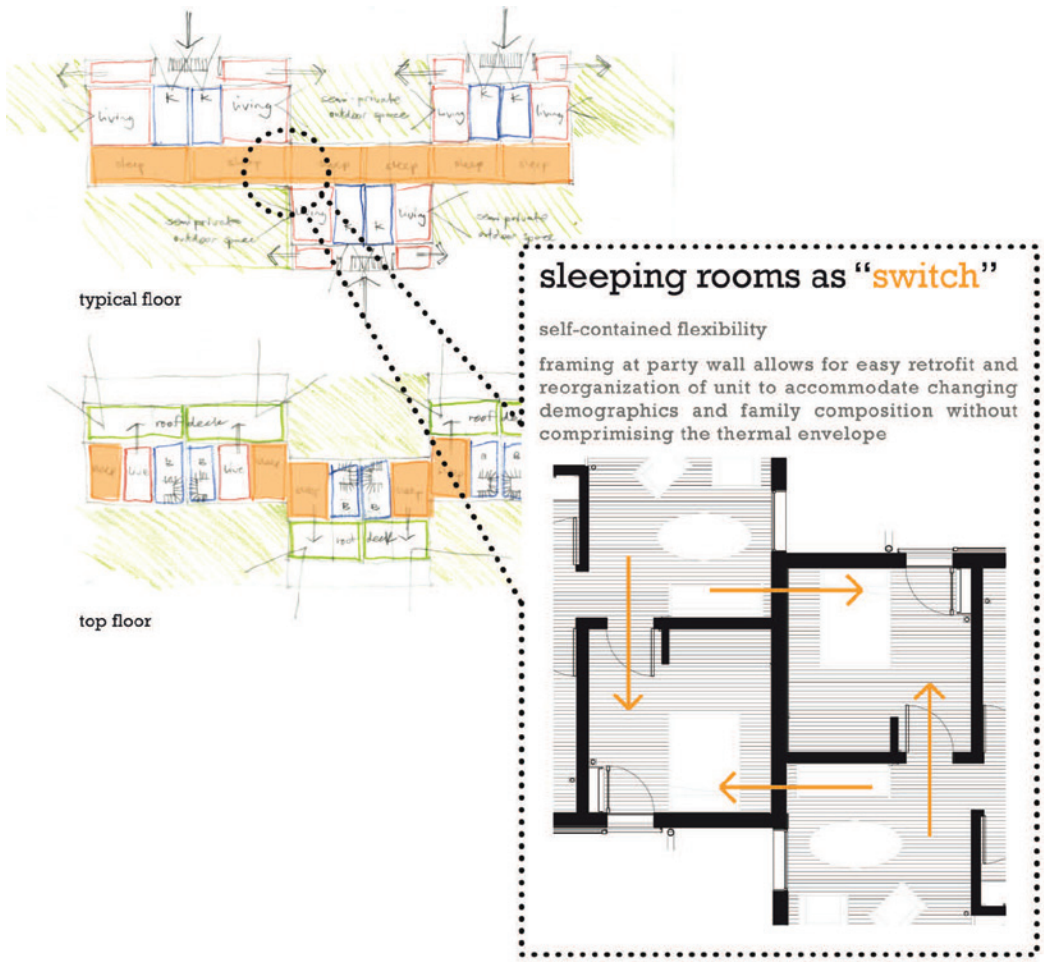


Figure 40: Diagram showing typical organization of housing units - sleeping spaces are shown in orange and act as "switches," allowing the boundaries of individual units to be re-drawn as occupant needs or demographics change (Shane O'Neil).

a rich diversity of unit types that can accommodate changing demographics throughout time. The unit types range from a one-room, 484-square-foot unit meant for one or two people, to a five-room, 1,012-square-foot unit meant for five or six people, including a number of possible arrangements in between. This allows a great degree of flexibility in discerning the initial unit composition based on target demographics as well as the ability to adapt the building throughout time as demographic and occupant needs change. The change is allowed to occur because the sleeping spaces are arranged to act as switches, whereby the unit is allowed to expand or contract according to the needs of the occupants while the main living spaces of the unit (kitchen, eating/living area, bathroom) remain essentially unchanged in their relationship to the street. This is accomplished by re-imagining the way in which the boundaries between units (party walls, floors, and ceilings) are constructed in order to pre-accommodate the necessary fire and smoke protections between dwelling units as those boundaries change.

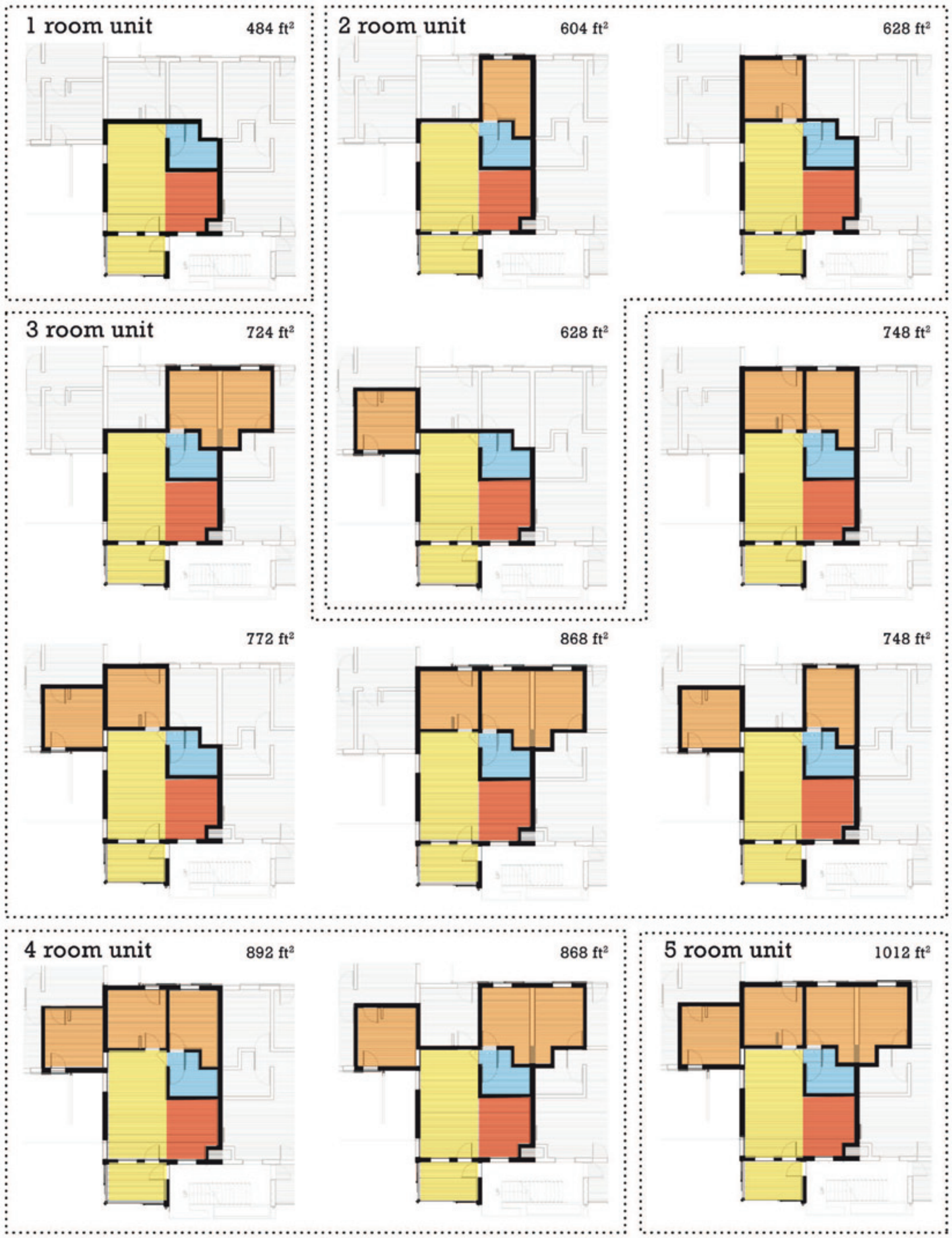


Figure 41: Iterations of unit types, showing changes in unit layout. Sleeping spaces are shown in orange, living space and entry loggia in yellow, kitchen in red, and bathroom in blue (Shane O'Neil).

At the site scale, the design creates an alternating rhythm of layered streetscapes at the entries of the buildings and open, natural, landscape courtyards that separate the buildings and provide light, fresh air, and privacy

Figure 42: Exterior view showing proposed streetscape at the Orchard Village site (Shane O'Neil).

for residents. The living space and kitchen are pushed toward the edge of the streetscape and buffered by the entry loggias and stair and shaded by a multi-layered façade consisting of roll-down natural fiber shades and sliding composite glass panels. The sleeping spaces are pulled back from the public realm and buffered by the landscape courtyard and shaded by a layer of sliding shutters to allow for maximum control of privacy without compromising the function of the passive design strategies. While the changes inside of the unit are meant to happen on the scale of months or years, the outside of the unit has the capacity to change throughout the day in order to respond to the needs of the occupants.

Ali Clark's proposal for the Orchard Village site seeks to capitalize on the flexibility provided by single-family housing, but at higher densities that create a more vibrant, walkable community. The design uses a traditional row house form and focuses on the latent potential for change afforded by vertical, rather than horizontal, space within the unit. The typical units are a three-story, three-bedroom, 1,466-square-foot single-family home entered from the north and a two-story, two-bedroom,1,123-square-foot single-family home entered from the south. Designing for the entry sequence and stairs to be in close conjunction physically separates the stairs from the rest of the living spaces, allowing the single-family home to be subdivided into multiple units. The three-story home can be split up into as many as three separate flats and the two-story home can be split up into two separate flats, which creates the potential to nearly triple the initial density of the site. When these changes occur as a product of changing family needs, such as when adult children leave the home, the home maintains

Figure 43: Plans and diagrams showing how typical two- and three-story unit can be subdivided into multiple different units as occupant needs or demographics change (Ali Clark).

its relationship to the outdoors and the composition of the neighborhood changes only slightly. This proposal creates a community that can become more dense and accommodate different household types as the need arises and without any significant disturbance to the neighborhood.

High-Performance Housing

The goal of high-performance housing is maximum resource efficiency and, in turn, maximum occupant comfort. An understanding of the principles of building science (moisture movement through construction assembly, heat transfer, indoor climate, ventilation, and dew point) is necessary to evaluate any high-performance strategy. These strategies can include a combination of passive design and advanced technological assistance (such as active renewable systems or high-efficiency mechanical heating/cooling), but the end result of resource efficiency and occupant comfort is most important. Therefore, it is useful to design towards a goal using strategies that have been tested and for which there are easily employed means of evaluation. One such metric the students integrated is the Passivhaus Standard, which establishes maximum source energy and heating load based upon conditioned floor area and a minimum level of air-tightness in the thermal envelope. The basic idea is that by minimizing the amount of unwanted heat loss and heat gain through the envelope, the building will remain consistently comfortable and may not even require any supplementary space heating. The Passivhaus Standard has been shown to reduce heating energy consumption by as much as 90% and reduce overall energy consumption by as much as 65%, which has the potential to greatly increase long-term affordability if applied to public housing.

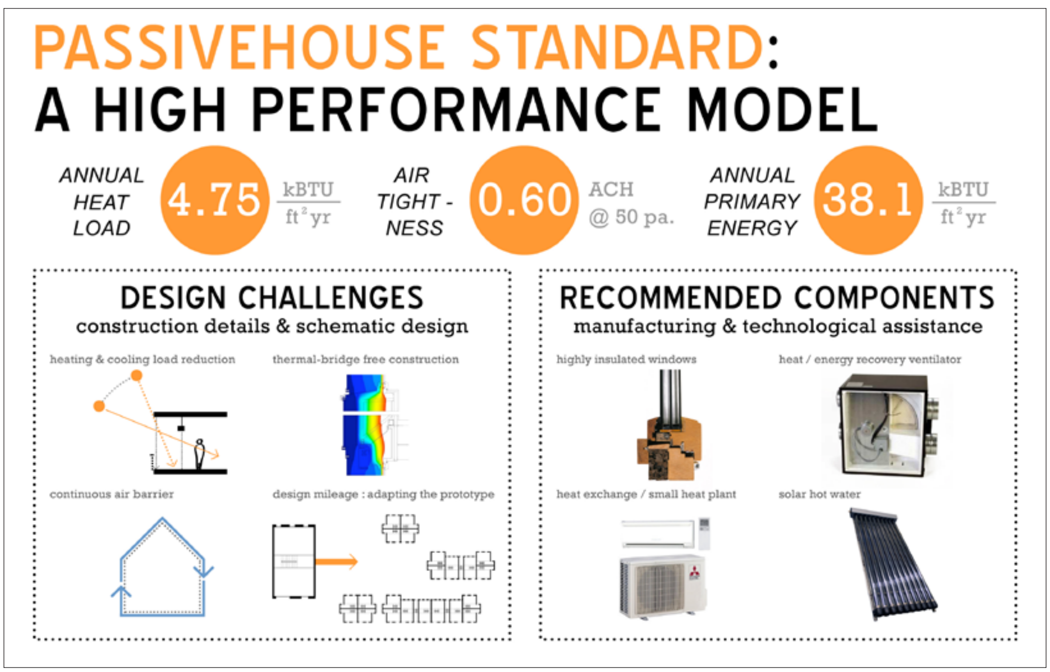


Figure 44: Performance-based metrics of the Passivhaus Standard for maximum annual heating load, minimum air-tightness, and maximum annual source energy, and diagrams showing design response and components needed to meet the standard (Shane O'Neil).

Build High-Performance Housing

The idea of a structure being high-performance is often repeated but seldom explained. That is to say, high-performance is something of a buzzword these days, casually employed and sometimes exploited by the building industry. In the students' work, there was a conscious and rigorous attempt to define the impetus for and benefits of high-performance building as they relate to housing.

Starting with the impetus to design resilient buildings down to the smallest details, the importance of designing high-performance buildings arises as a response to conventional building practices' privileging of expediency over long-term resiliency. Most of these conventions tell the developer, architect, and builder what materials they can use, what systems housing can use, how they can construct the exterior walls, and even how the building can relate to the land.

In a period of great technological and cultural change, the housing industry has yet to fully integrate the benefits of those changes to improve the performance of housing stock. When one considers the trajectory of the building industry over the last 40 years, it is clear that commercial and institutional buildings are the main force behind the advancement of high-performance building. The main logic behind this trend is business logic. Commercial and institutional buildings are a product of long-term planning decisions made by business people and public servants. The life-cycle of the building, its operating costs, its continued utility and value, and its effect on its occupants are integrated into the design from an early stage as a result. From this perspective, the decision to design high-performance buildings is a rational one, but it has produced some of the finest architecture of our time.

In housing, however, the calculations are different, because most housing is built speculatively. The life-cycle, operating costs, future utility, future value, and effect on occupants of the building do not influence the business of developing housing. The single biggest factor in housing development economics is first-day cost. Considering the tradeoff of initial investment for continued return that high-performance buildings often require, it is easy to understand why the housing industry has not followed the same trajectory as commercial and institutional buildings.

Housing is more personal and emotional than commercial or institutional building, and this is clear in the way housing is marketed. The students' proposals explore different means of engendering a more sustainable housing stock. Acknowledging the emotional dynamic of the housing market, the students pursued strategies to make the benefits of high-performance housing more tangible, and their proposals show the potential for public housing to be more comfortable to live in. The SHA, and other public or non-profit institutions, can capitalize upon the business logic of high-performance building to provide a positive case study showing the benefits of and demand for high-performance housing in the Northwest. The students took this opportunity to invert the

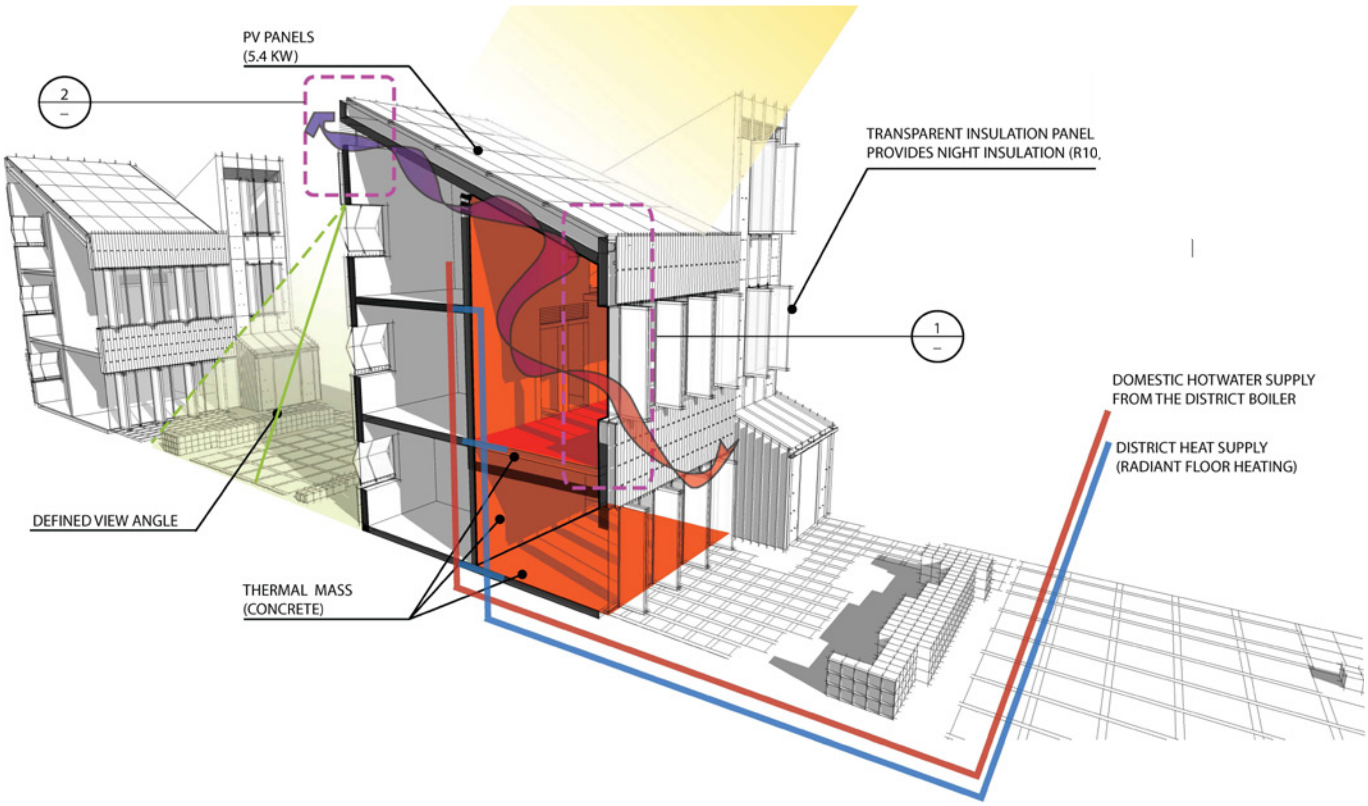
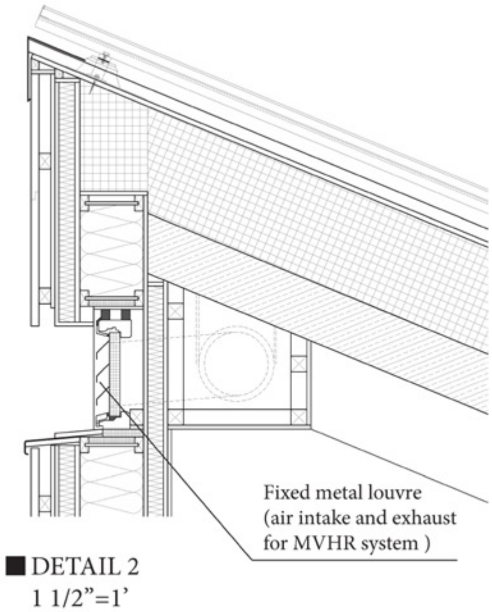


Figure 45: Cross-section through typical housing unit showing passive and active design strategies (Wei Yan).

traditional conception of public housing by showing how high quality, livable, high-performance, and affordable housing is an attainable, economic goal.

Wei Yan embraced the challenge of creating high-performance, affordable housing in her proposal for the Meadowlark Village infill site. She focused the design of the unit on passive solar heating, natural ventilation, and nighttime ventilation of thermal mass while integrating a 5.4 kW photovoltaic array, a super-insulated and airtight envelope, high-efficiency heat recovery ventilation, and district-wide hot water for domestic use and radiant floor heating. The unit is designed to meet the Passivhaus Standard.

The reinforced concrete structure in Yan's design is left exposed in order to provide thermal mass, reduce the cost of finish materials, reduce maintenance needs, and accommodate the necessary fire separations within the unit. The thick exterior walls are timber construction, with cellulose insulation filling the structural cavity and rigid insulation outside of the sheathing to eliminate thermal bridging. The wall assembly is finished on the exterior with a cedar rain screen assembly, which allows the wall to ventilate and drain properly, thus protecting the thermal envelope from the damaging effects of moisture and extending the life of the building.



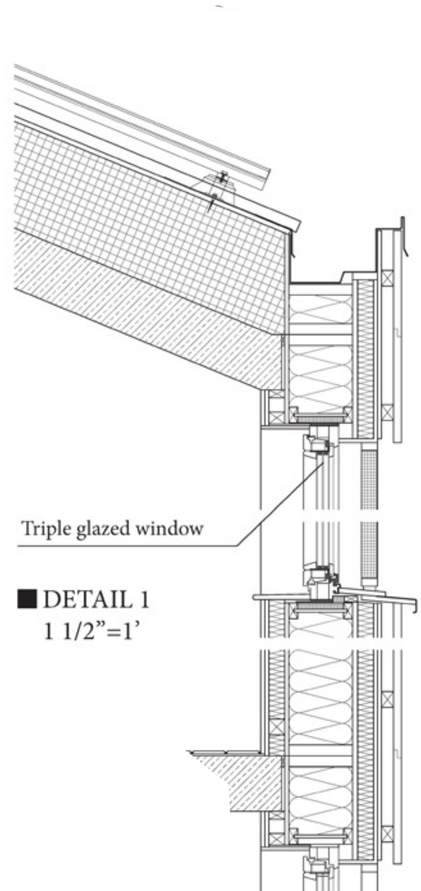


Figure 46 and 47: Construction details of the façade and roof assemblies at the eaves of the roof (Wei Yan).

On the energy side, these strategies add up to create housing that is near net-zero energy and which costs very little for the occupant to live in. As the cost of energy increases with time, the initial investments in the bones of the building will offset any potential increases in the cost of living. From a perspective of livability, these strategies increase occupant comfort and mitigate issues of privacy and unwanted noise between neighbors, thus supporting the increase of density on the site. In addition, the elimination of cold spots and drafts within the unit allow a more compact housing unit to be more comfortably inhabited, thus reducing initial material costs and further supporting the increase of density. The students sought to align the pursuits of high-performance housing with beauty, livability, privacy, comfort, energy efficiency, material efficiency, and durability.

Shane O’Neil followed this logic to propose public housing at an average density of 26.8 units per acre on the Orchard Village site that is designed to meet the Passivhaus Standard. The building footprints are compact and the massing is simple and provides plenty of solar access to the units. A similar methodology is followed in creating an insulated, airtight envelope. The overall insulation needed is less than the 14 inches used in Yan’s design, as the four- and six-unit buildings that repeat on the site reduce the ratio of exposed surface area to volume in the units, thus reducing the initial heating demand. Windows are concentrated on the south façade for passive solar gain, but are balanced with windows on the east and west facades for more even daylighting. All windows are triple-glazed and seasonally shaded using a variety of strategies that also protect occupant privacy. The façade will change throughout the days as occupancy patterns are expressed in the modulation of these shading layers of the façade. This allows the skin of the building to remain simple and elegant, as the building is animated by the life of the occupants.

In a similar manner as in Yan's design, the exterior walls are timber construction (staggered 2x6 wall with cellulose cavity insulation) with rigid insulation outside of the sheathing and a fiber-cement board rain screen. Advanced framing techniques and exterior insulation are used to reduce the amount of thermal bridging through elements such as floor plates and window headers. At the windows, the rigid insulation covers the frame of the window, leaving only the sash (if window is operable) exposed. This detail greatly improves the thermal performance of the window by reducing air infiltration and thermal bridging in the window frame. Similar attention is given to the detailing of exterior doors, so as to reduce thermal bridging and air infiltration.

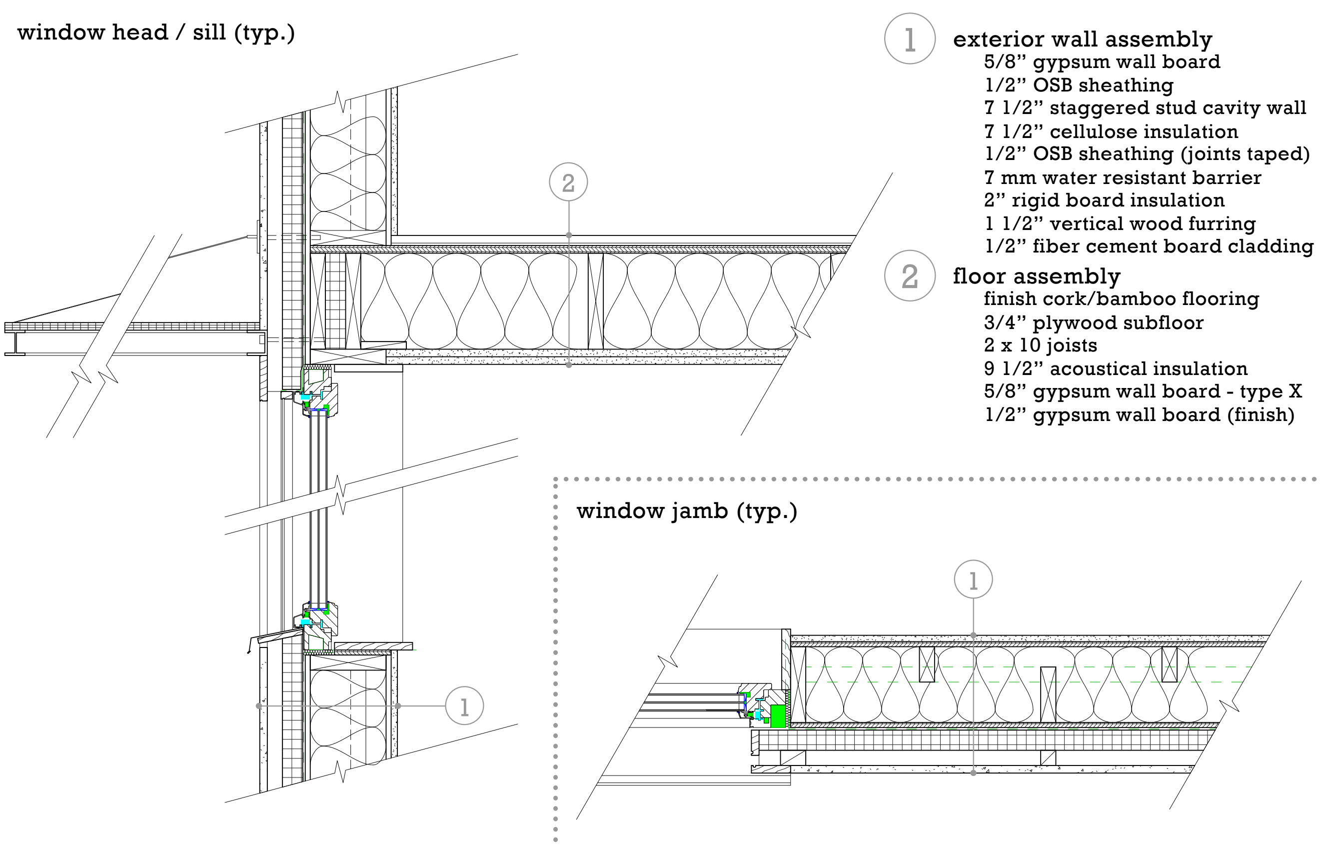


Figure 48: Construction detail of typical window head, sill, and jamb (Shane O'Neil).

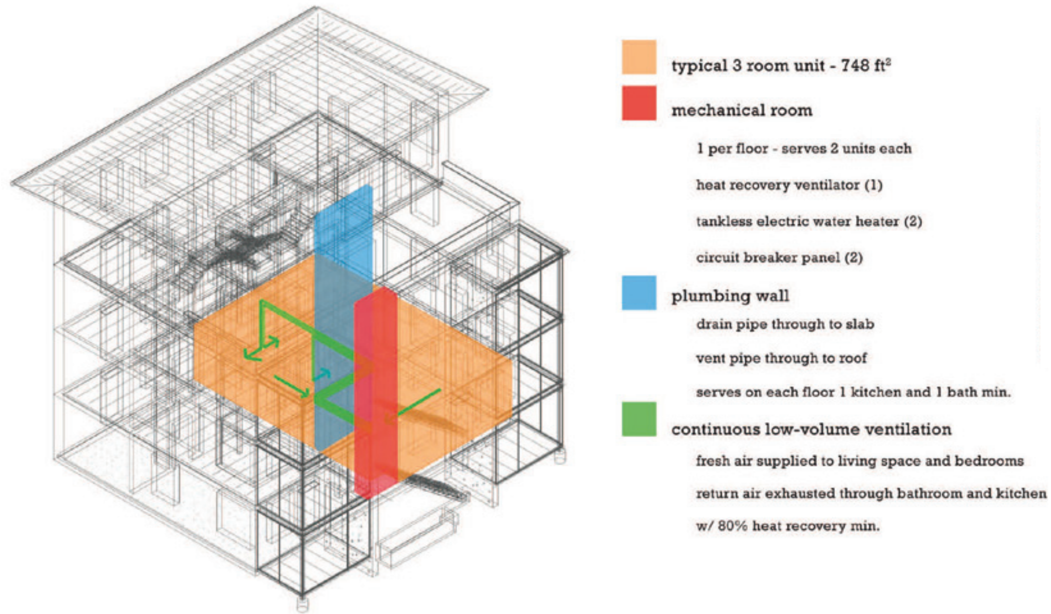


Figure 49: Diagram showing typical mechanical and plumbing layout (Shane O'Neil).

Mechanical ventilation is still needed if the building is constructed to eliminate air infiltration through the envelope as the Passivhaus Standard requires. A high-efficiency heat recovery ventilator (HRV) provides continuous low-volume ventilation while recovering at least 80% of the heat otherwise lost through exhaust ventilation to temper the incoming fresh air. In a loosely-constructed building, fresh air ventilation is not required because enough air passes through the envelope. This convention of building loosely to accommodate fresh air and minimum ventilation requirements has the potential to create indoor air quality problems. Air quality may be diminished if the air entering a space first passes through a wall or floor, which may be insulated with fiberglass batts or other irritating building materials. When an HRV supplies the space's fresh air, great care can be taken to ensure that air is free of pollutants or contaminants. Due to this added mechanical requirement, O'Neil's proposal includes a utility room on each floor, accessed off of the entry stair, containing one HRV per floor as well as a tankless water heater and circuit breaker panel for each unit on the floor.

The students approached housing design anchored in the real economics of building, yet did not find any insurmountable challenges to integrating high-performance design. On the contrary, the students took on the challenges and sought solutions that yielded multiple positive benefits for both the owners and occupants. The strategies mentioned above can be implemented using readily available materials and components, and using construction methods that are becoming perfected in the Northwest.

Integrate Local Food Production Networks into Public Housing

In economically stressed households, there is the potential for expenses like housing, utilities, transportation, clothing, and food to unsustainably burden household finances. The SHA seeks to remedy part of this situation by providing housing that underserved families and individuals can afford. The physical design of the housing can reduce the burden of operating expenses on occupants, especially when passive design and high-performance design principles are integrated into the project from an early stage. Various other public agencies can offer support to these households as well, such as the Oregon Department of Health and Human Services' Supplemental Nutritional Assistance Program, but they seldom work to resolve the underlying source of the burden. In acknowledging the connection between food and health, as well as their economic ramifications, the SHA can take this opportunity to envision a new way public housing can offer support to its residents.

As part of nearly every housing development, there are outdoor spaces meant for the residents to enjoy. Often, these take the form of sprawling playfields and arbitrary patches of grass or shrubbery between sidewalks and buildings, and may even include a picnic table or two. As the SHA seeks to optimize the use of the site, it could harness the latent potential of Oregon's year-round growing season and the Willamette Valley's rich soil and provide for its residents ample, sun-drenched garden space.

Integrating local food production networks into housing can reduce economic burdens on households, improve community interaction, improve stormwater management, reduce pollution, reduce incidence of vandalism on site,

Figure 50: Exterior view from the sidewalk showing the south face of housing units and garden beds for ground floor and upper floor units (Shane Harper).

Figure 51: View from above upper floor patio showing relationship of garden spaces between units (Shane Harper).

optimize site use, and even offer economic opportunity to residents. Further, the geographical origin and delivery path of a community's food supply are essential variables in the equation for long-term sustainable development, ones that are often neglected. Designing public housing with an acknowledgement of the economic, environmental, and social impacts of local food production networks will provide more opportunities for economic empowerment to its residents.

According to research garnered from the Integral Urban House (Olkowski et al. 2008), 880 square feet of garden space is enough to provide for all of the fruits and vegetables eaten annually by the average person. This number, while based on evidence and observation, is theoretical. It can only provide guidance in determining the carrying capacity of a site in terms of food production potential,

Figure 52: Garden view showing parking courts and two-story Garden Side Yard Houses connected by shared garden spaces (Erin Upham).

but it establishes a meaningful precedent for the economic benefits of urban homesteading.

Many of the students’ proposals include, as part of the site design, spaces for growing food. These take many different forms, but the most common is the community garden. In their accommodations, the garden space required good solar access and often became a focal point of the landscape.

Shane Harper proposes a modest but meaningful way to incorporate this recommendation, distributing individual garden plots to the south and on the south face of each building, promoting community and providing a beautiful setting on the street. These gardens are located between adjacent units in order to protect privacy but also to engender neighborly interaction. Entry patios are located alongside the gardens, so neighbors can enjoy their outdoor spaces with a sense of separateness, but not isolation. The gardens are also

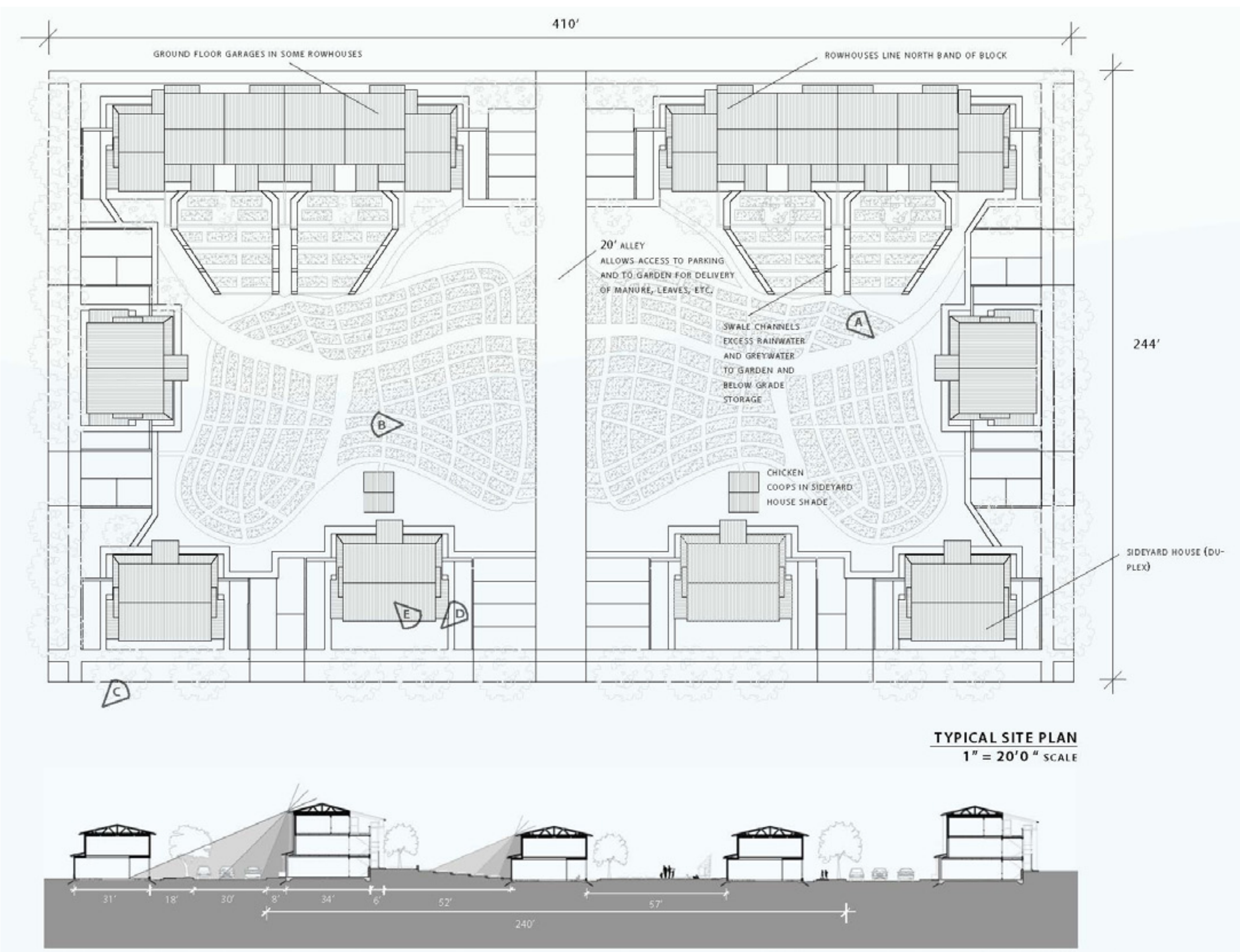


Figure 53: Typical site plan and site cross-section of an urban block in Salem (Erin Upham).

immediately outside the ground floor units' bedroom, creating a buffered layer of privacy and beauty from the street. In turn, small raised garden beds are provided for the upper units off the south facing patio. Each upper unit's patio and garden bed is above the corresponding ground floor unit's entry patio and gardens, creating a dialog between the outdoor spaces for each upper and lower unit.

Erin Upham's proposal sought to explore what types of multi-family housing emerge when local food production networks are integrated on-site from an early stage of design. She includes in her conception of how to integrate food production the need to harvest rainwater on-site. Two distinct types emerged, arising out of the needs of a productive garden and different site conditions such as lots in the middle of a block versus those on the corner or lots on the south edge or north edge of the site. The first is the Garden Terrace Row House, three-story attached housing whose interior can be configured in many different ways, particularly on the ground floor, to accommodate a variety of potential household types. These include a three-story single family home, three-stacked individual flats, or a multi-story townhouse unit atop a ground floor, ADA accessible flat. Interior garages, office space, or retail storefronts may also be located on the ground floor of the row house. The form of the Garden Terrace Row House steps vertically toward the north, as south-facing sunspaces recede from the garden to maximize surface area available for porches and sunspaces with garden views. Between the attached units, a large cistern collects 100% of the rainwater from the roof and can be used to store 17 to 33% of the graywater produced within the home for summer irrigation. The second type is the Garden

Figure 54: Exterior view showing the south façade of the Garden Terrace Row house and layers of private and community gardens (Erin Upham).

Side Yard House, a two-story duplex where side yards separate buildings and create points of entry to the units through the side yard that engender a strong connection to the shared garden space contained in the center of the site.

Both types of housing proposed by Erin Upham feature south-facing sunspaces that act as seasonally adjustable solar heat gain collectors as well as serving as in-between spaces connecting the layers of garden and the private kitchens. These elements are designed to open and expand in warm weather, opening onto an outdoor patio that accesses a private garden with views to the community garden beyond.

These compact housing types (1,000 square feet to 1,900 square feet) are sited on relatively small lots (1,950 square feet to 2,200 square feet, respectively) with close access to shared common gardens and open space. The common gardens and open space may be held in common by the SHA or a neighborhood association that oversees a farmer-in-residence who provides

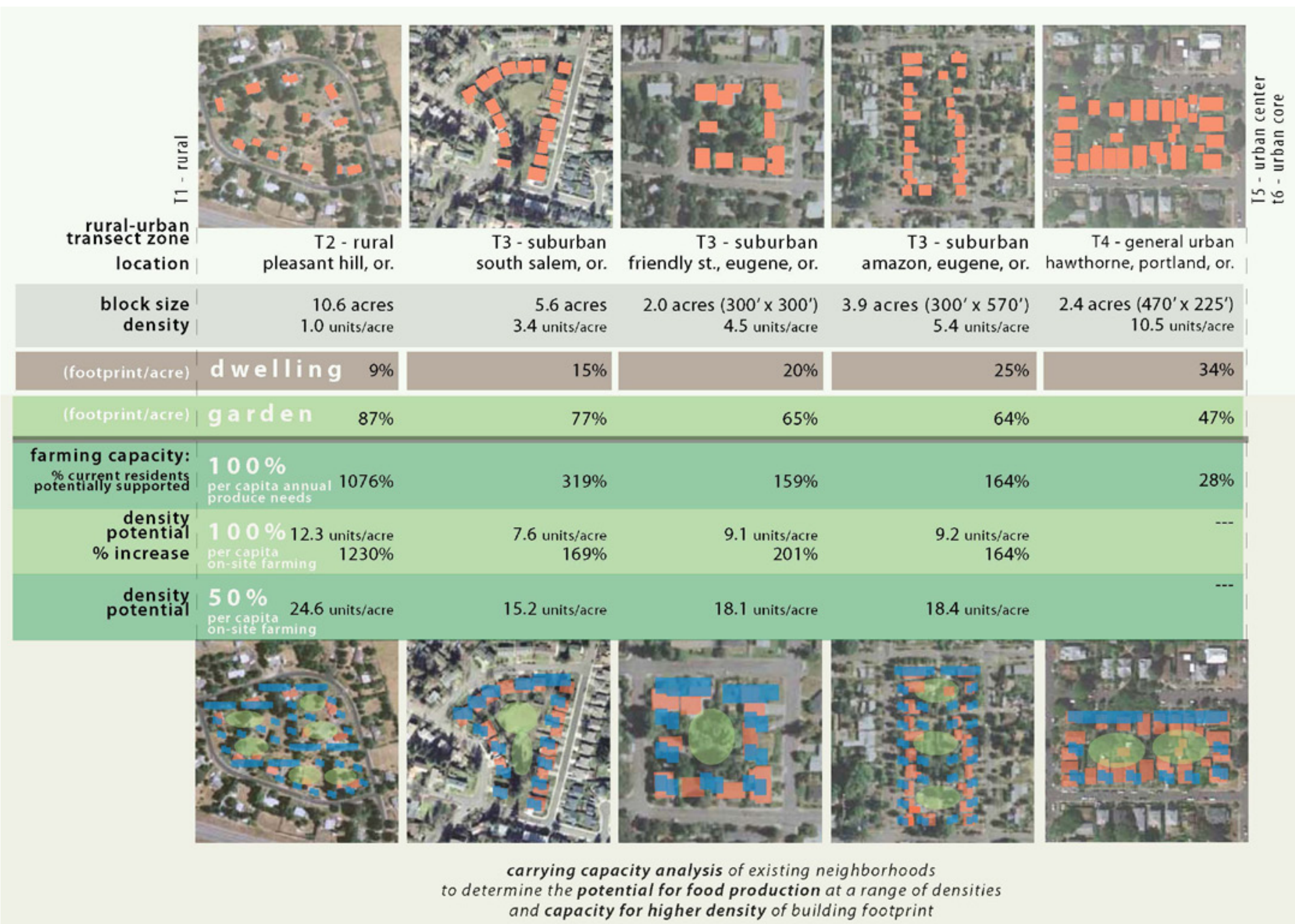


Figure 55: Analysis of food production carrying capacity of various suburban and urban existing neighborhoods throughout Oregon to determine the potential for food production at a range of densities and capacity for higher residential density (Erin Upham).

fresh vegetables, fruits, and eggs to residents year round through an on-site community-supported agriculture (CSA) program. Alternately, residents may portion out individual garden plots within the common area and participate in growing their own food.

Applying this principle to retrofit and revitalization projects, it becomes easy to implement change from the neighborhood scale to the individual unit/lot scale. This latent food production potential begins to be harnessed when typically underutilized front and back yard and sidewalk plantings transform into productive gardens and garden support spaces. At the same time, traditional, symmetrical neighborhood layouts and street-centric buildings transform into garden-centric buildings, focusing on maximizing solar exposure to garden areas while still retaining formal connections to the neighborhood. Shaded areas can be used for functions where access to direct sunlight is not essential, such as parking, canning sheds, and garden-related storage.

Integrating food production into existing public housing developments has the potential to transform the sprawling, alienating nature of these suburban settlements into rich, thriving hubs of community life through the process of providing life-sustaining resources to local populations.

The SHA can integrate local food production networks into new developments and use them as an education tool, providing direct opportunities for residents to learn skills that aid in self-sustenance. The SHA can develop garden plots that residents can use to grow their food. They can hire a farmer-in-residence in addition to, or in lieu of, an on-site manager who would be responsible for tending the grounds. Participation in on-site CSA programs could become a standard part of the SHA's services, offering support for a healthy lifestyle in their residents.

Integrating local food production networks into public housing has the potential to create a rich new template for tapping unrealized value in public land. It can provide tangible services, healthful goods, and economic opportunity to the SHA's clientele.

Local Recommendations

Where the previous section exhibited design strategies to inform the design of housing in general, this section will address the studio's recommendations for specific SHA sites. Following the organization of the studio, the students first developed individual kits-of-parts responding to global issues in the design of housing. They then each developed site-specific proposals for one of the three existing SHA properties listed above. In developing their proposals on the SHA sites, the students had control over unit composition, density targets, program of spaces, and scope of development, resulting in a wide array of responses in terms of housing type and site design.

Orchard Village

At the Orchard Village site, the students encountered an underutilized piece of land lying opportunely between established residential neighborhoods and high-volume commercial developments. When presented with the opportunity to integrate the neighboring two-acre parcel into their proposals, some students saw the great potential to revitalize the area with thoughtful infill development. The development of the two-acre site next to Orchard Village, coupled with infrastructure upgrades along Broadway Street, would significantly improve the pedestrian environment and bicycle mobility. Many of the students took advantage of that opportunity and integrated market-rate housing, commercial space, and community resource space into their proposals. Site improvements, infrastructure investments, and mixed-use strategies work together to create vibrant and livable high-density neighborhoods.

Considering the potential for the Orchard Village site to transcend the stigma of public housing and be an example of proactive development in a city yearning for positive examples of density, the site presents itself as ripe for a partnership with local non-profit organizations, neighborhood economic development corporations, and private developers. This would mean complicating the process and planning of public housing, but such additional planning nevertheless stands to capitalize upon the unique character of an infill site like Orchard Village.

At the west end of the Orchard Village site, at Broadway Street, many of the students' proposals extend Delmar Drive North, from an existing residential neighborhood across Broadway Street, westward to create a new entrance to the Orchard Village site. Connecting the new entrance to the site to existing infrastructure allows for added traffic controls along Broadway Street and River Road North, which could help to reduce traffic speed along Broadway and River Road and increase safety for pedestrians and bicyclists. Connecting to existing neighborhoods has the potential to increase walking, bicycle use, and public transit use in those neighborhoods, particularly if the new Orchard Village site includes mixed-use buildings along Broadway Street.

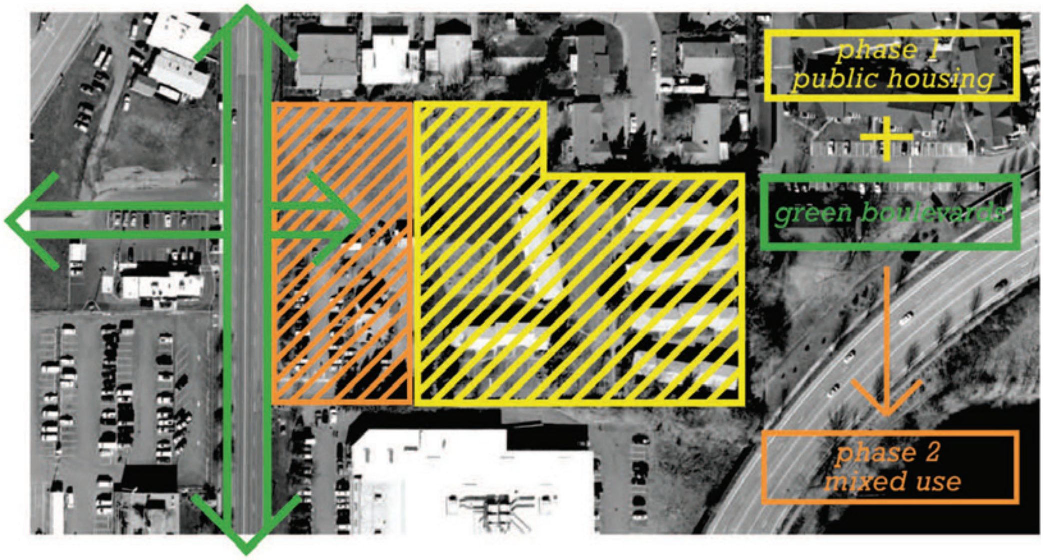


Figure 56: Diagram of proposed context and uses for the Orchard Village site (Shane O'Neil).

To further increase pedestrian and bicyclist safety and mobility, the Orchard Village site can provide a vital pedestrian connection between Broadway Street and the Salem Parkway Bike Path. In many of the students' proposals, a pedestrian path is placed along the south edge of the site and automobile traffic is either restricted or limited along the south edge. The pedestrian path shown in Figure 57 follows the route of the existing automobile entrance to the site. If closed to automobile traffic or closed to through-traffic only, the path can accommodate emergency vehicles and reduce the amount of new infrastructure

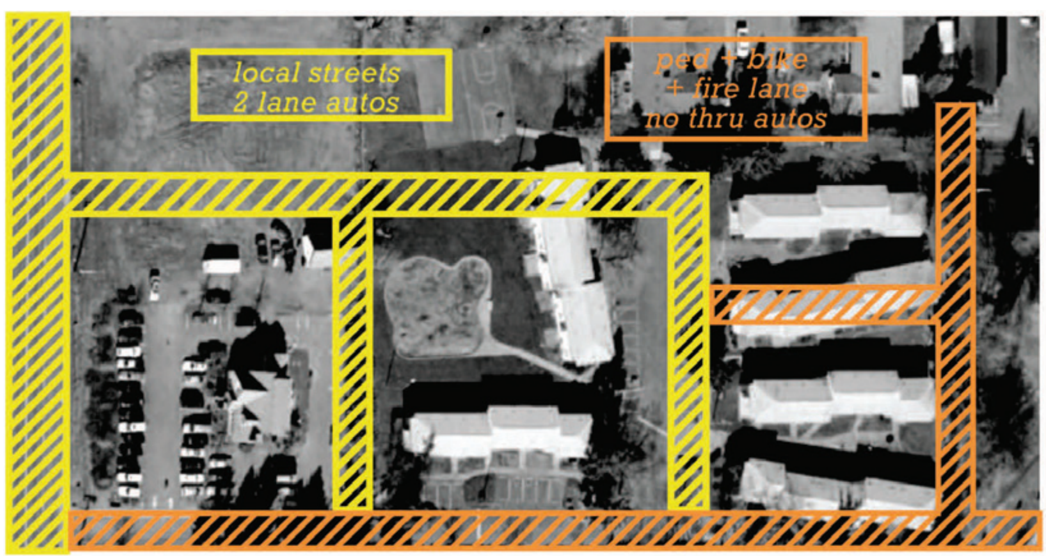


Figure 57: Diagram of proposed circulation on the Orchard Village site showing automobile streets in yellow and pedestrian streets in orange (Shane O'Neil).

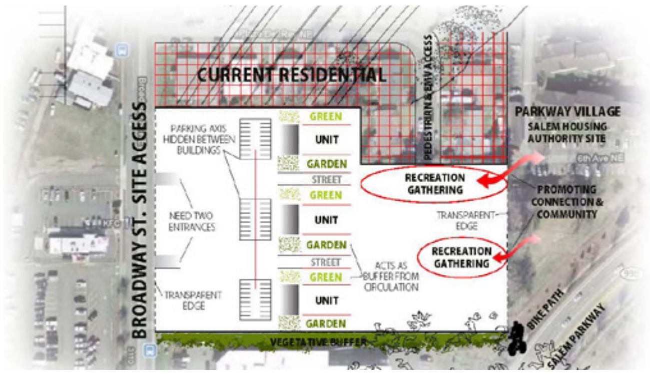


Figure 58: Proposed Orchard Village site plan (Shane Harper).

needed. The bike/pedestrian path would connect the site to existing public transit lines on Broadway Street and would help connect the existing neighborhood to downtown via the Salem Parkway Bike Path.

In Shane Harper's proposal for the Orchard Village site, he envisions the site as peaceful and serene, creating a beautiful community focused on enriching the residents' day-to-day experience. Parking provided for the residents is contained within smaller pods hidden in between blocks of buildings; it is convenient and safe, but it is not omnipresent. The parking areas can still be seen from most of the site, for reasons of convenience and safety, but the front of each residential unit has unobstructed views of gardens, trees, and community spaces. The 80 housing units are grouped into clusters of about ten units throughout the site, accommodating automobile and pedestrian circulation, parking, community gathering and recreation spaces at an average density of 20 units per acre. Layers of green space and garden space separate

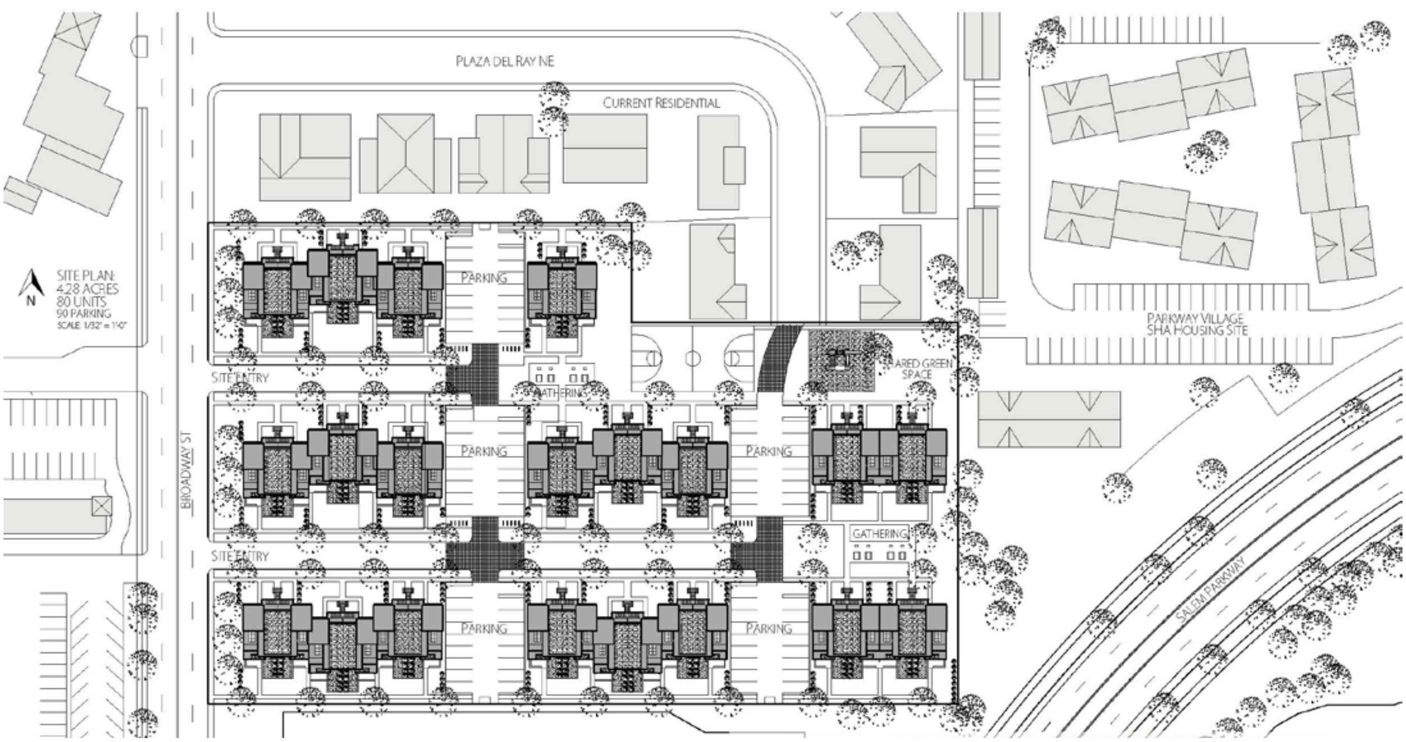


Figure 59: Diagram of proposed Orchard Village site showing uses and relationship to existing neighborhoods (Shane Harper).

Figure 60: Exterior view of outdoor community space which includes picnic areas, basketball court, and playground at the north end of the Orchard Village site, looking toward existing Parkway Village public housing (Shane Harper).

the housing from the streets, and native deciduous trees line the streets to create a peaceful atmosphere apart from the hustle and bustle of public life.

Harper chose to connect the existing Parkway Village public housing to the new Orchard Village housing by placing a community recreation area at the northeast corner of the Orchard Village site. The recreation area contains picnic space, a basketball court, and playground, and also connects via pedestrian/bicycle path to the existing residential neighborhood to the north of the Orchard Village site.

Caitlin Gilman's proposal, in a similar manner, uses the northeast edge of the site to connect Orchard Village and Parkway Village, including garden spaces, playground, lush plantings, and a rain garden. The rain garden, located at the northern edge of the site, helps prevent any stormwater drainage issues that may occur as a result of redeveloping the Orchard Village site. The rain garden would also provide a beautiful amenity to the site's northern neighbors and would be a clear improvement to the invasive blackberry and English ivy currently inhabiting the site's border.

Of particular interest on the Orchard Village site are the site density and occupancy figures the students' proposals showed were possible. On the nearly 4.5-acre Orchard Village site, including the adjacent 1.5-acre privately-held lot, the students were able to achieve densities of up to 30 units per acre, providing about 100 public housing units that can house more than 300 people in total, along with market-rate housing and commercial buildings. These density figures are a moving target, however, as the students tended to design their units and buildings such a way that variations in initial and future unit composition can occur in order to respond to changing demographics or occupant needs.

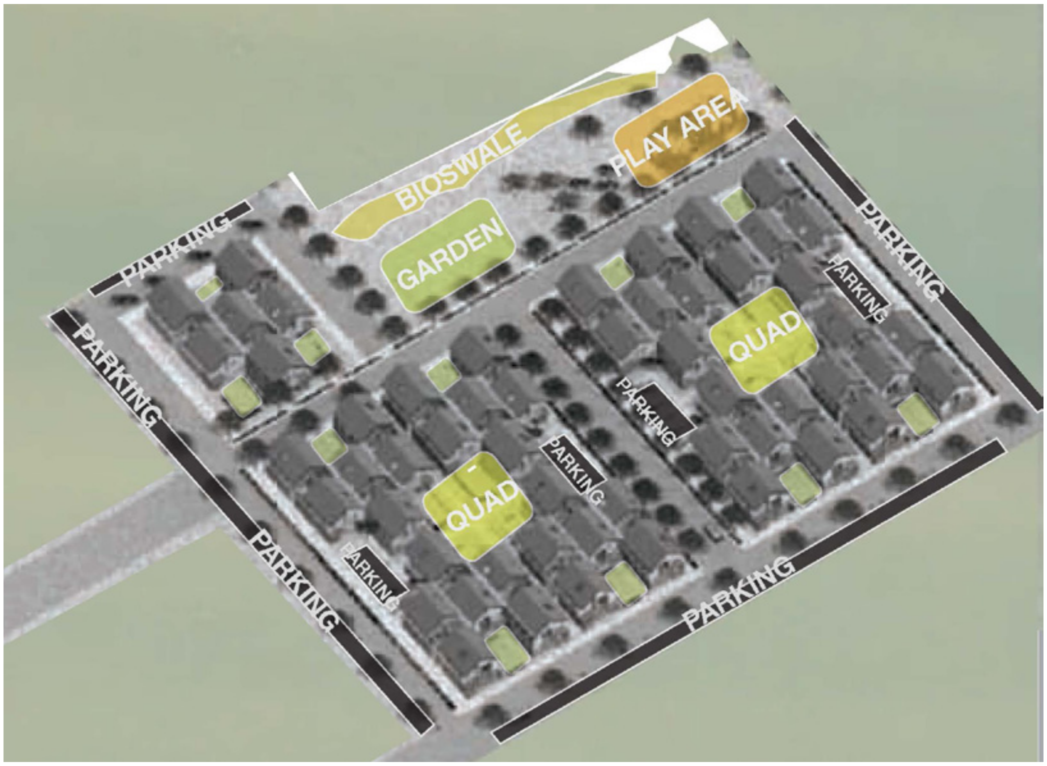


Figure 61: Diagram showing proposed uses on the Orchard Village site, specifically the proposed shared green space at the northeast corner of the site (Caitlin Gilman).

Shane O'Neil's proposal integrates mixed-use strategies on the west end of the site, creating a gradient of density and activity across the east-west axis of the site. The west end of the site is most densely built-up and contains commercial spaces, community resource spaces, and below market-rate housing. The site then transitions into high-density public housing, punctuated by landscape courtyards tucked in between the housing at the center of the site. The east end contains lower density public housing that is more tightly knit within the landscape. This gradient applies to traffic as well. Vehicles enter from the west, but there are no through streets, so in the center of the site traffic is slowed and local and the east end of the site becomes a pedestrian zone, connecting to the Salem Parkway Bike Path. The design includes 100 units of public housing and 30 units of market-rate housing above 21,000 square feet of market-rate commercial space and 6,300 square feet of community-leasable commercial space.

The rhythmic form of the buildings contrasts densely inhabited building fronts with natural landscape courtyards on the sidewalk, which offer periods of natural relief to an otherwise urban environment, also improving safety on the site. Each unit's living spaces inhabit the corner of the building, allowing an "eyes on the street" form of community safety to occur naturally. In addition, the building massing and site design places entrances to units on every side of the street

Figure 62: Orchard Village site plan and cross-section with accompanying site gradient diagram showing east-west distribution of building density, landscape density, vehicle access, and pedestrian access (Shane O'Neil).

and looking in every direction, leaving no uninhabited corners or dead space, further enhancing the function of the "eyes on the street".

Ali Clark's proposal approaches site circulation using a Dutch woonerf, or "living street," allowing certain local streets to become usable outdoor rooms while also accommodating vehicles and parking. A woonerf heightens the awareness of the driver by putting obstacles such as trees, planter beds, and parked cars in the street, thus forcing the driver to slow down and allowing pedestrians and children to more safely inhabit the street. The woonerfs are situated between the fronts of the units, while pedestrian garden zones are situated between the backs of the units, creating residential zones buffered from through-traffic that allow children to play safely and optimize the usability of the site.

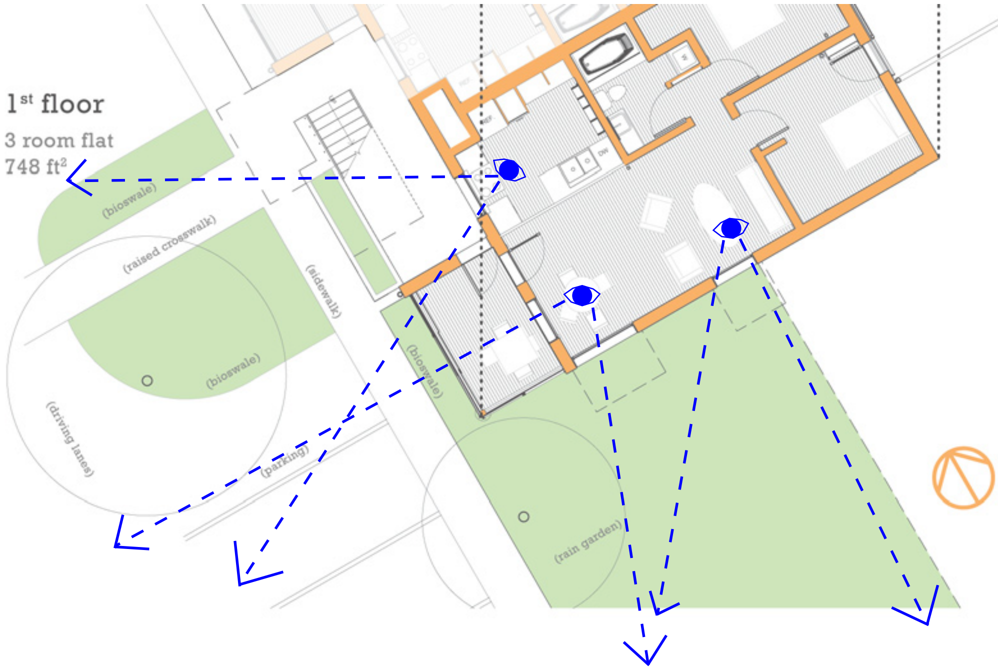


Figure 63: Eyes on the street – living spaces are pushed to the edges and corners, allowing residents to keep an eye on the streets, thus improving safety on the Orchard Village site (Shane O'Neil).

Figure 64: Exterior view showing the front entry of the units and woonerf, or "living street," where parking, hardscaped play areas, and landscape elements slow down traffic and create an outdoor room (Ali Clark).

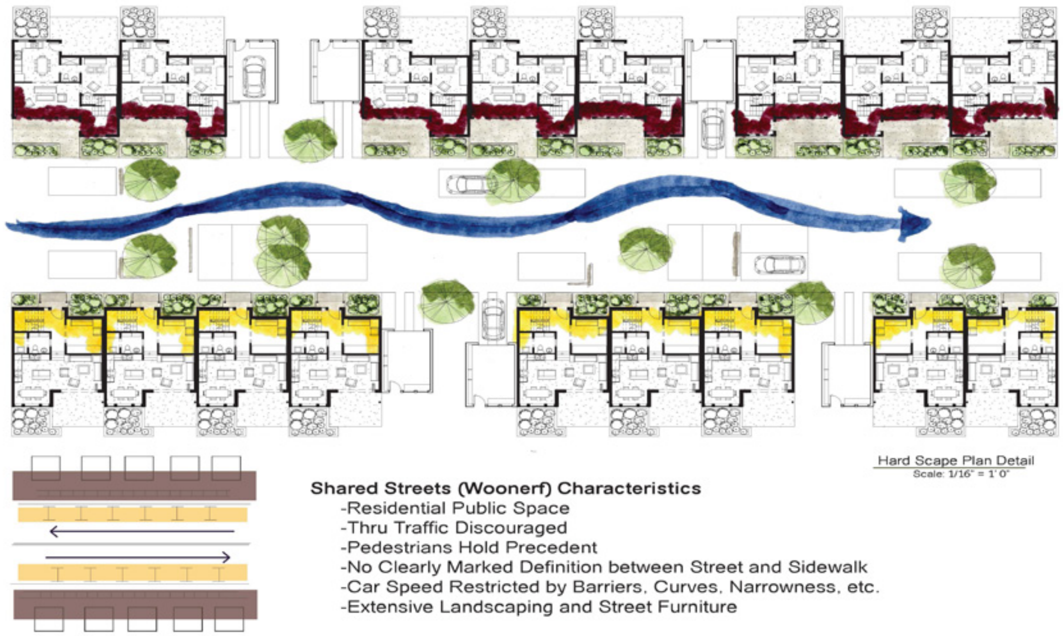


Figure 65: Diagram of residential woonerf showing traffic lane, parking spaces, and landscape elements connecting the front of the units (Ali Clark).

Meadowlark Village

The students' proposals focus on infill strategies, as the 1.5-acre undeveloped portion of the site presented the largest opportunities for short-term improvement for Meadowlark Village and its residents. The relationship of the infill site to the existing housing suggests a multi-phase redevelopment strategy may best fulfill the long-term needs of the site. The initial development proposals for the undeveloped portion of the Meadowlark site can inform later redevelopment of the existing housing.

On the 1.5-acre infill site, the students showed that the Meadowlark Village site can support higher density living than it does currently while improving quality of life, privacy, security, and community interaction. In conjunction with global strategies such as passive design, future-proofing, and high-performance building, the students developed strategies to improve site and neighborhood scale issues typically found in suburban, residential areas. One such issue is the emphasis on the automobile in site design. Epitomized by the design critique the students were frequently confronted with—"where is the parking?"—design of the built environment is wrapped up in figuring out how to accommodate cars. The students' proposals for Meadowlark Village explore strategies for creating more child-friendly and pedestrian-friendly environments within Salem's zoning regulations, without sacrificing density or convenience.

Wei Yan's proposal creates an infill development where access to every unit is car-free and a production garden covers the parking. Yan clustered the parking

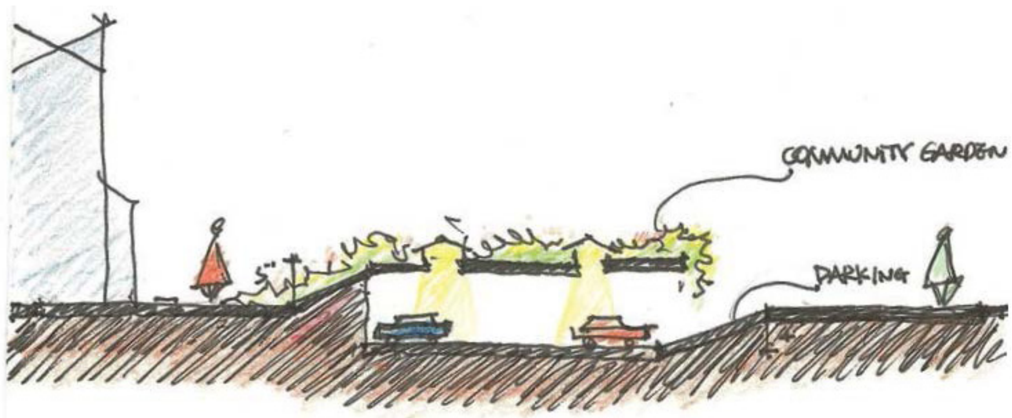


Figure 66: Diagram showing parking strategy on the Meadowlark Village infill site (Wei Yan).

on the east side of the infill lot, using the existing automobile infrastructure to access the site. As Figure 66 shows, the parking is sunk below grade and then wrapped in a community garden. Skylights provide daylight and ventilation for the parking.

Yan's proposal achieves a density of 34 units per acre, with the potential to house more than 200 people, while providing one parking space per unit and around 20,000 square feet of community garden space. The units are row houses in essence, but consist of 1,110-square-foot three-bedroom units stacked above 756-square-foot two-bedroom ground floor units. The buildings

Figure 67: Aerial view of Meadowlark Village infill development proposal, looking northeast (Wei Yan).

Figure 68: Pedestrian street view from between rows of housing on the Meadowlark Village site, looking northeast (Wei Yan).

are lined up along the east-west axis of the site, in rows of five to eight buildings. The layout of the units and buildings on the site maximizes solar access to each unit and optimizes building geometry to produce photovoltaic electricity.

In addition to providing an example of pedestrian-focused infill development, Yan's design stands to improve the character of the existing Meadowlark housing. The community garden, raised above the new parking, will be visible from across the site, provide a new amenity for existing residents, and serve as an identifiable symbol of community.

Campbell Frey's proposal for the Meadowlark Village site emerges from a desire to provide community-oriented multi-generational housing. Frey designed low-rise courtyard housing, organized around a shared greenhouse. Building off the impetus for multi-generational housing, Frey proposes integrating car-sharing programs into the site design in order to reduce the necessary investment in new infrastructure to accommodate parking. For a community composed of 40 units, 24 parking spaces are provided, six of which are reserved for use by car-share vehicles. Parking inhabits the north and east edges of the infill development, creating a pedestrian and child safe area across the majority of the 1.7-acre infill site.

A different strategy is taken in Peter Hanley's proposal for the Meadowlark site, one seeking to capitalize on the good elements of suburban housing using a decentralized organization of community amenities. 23 compact, semi-detached single family homes are arranged along winding streets punctuated by cul-de-sacs, off of which parking is located. The homes are clustered around cul-de-sacs that allow for cars to turn around and are also part of the pedestrian realm.

Figure 69: Site plan showing proposed site design for Meadowlark Village, new parking shown around north and east edges of infill development (Campbell Frey).

They are gathering and play areas. Small public gathering spaces featuring picnic benches, basketball hoops, and covered bicycle parking are distributed throughout the infill site, creating pockets of activity around the cul-de-sacs.

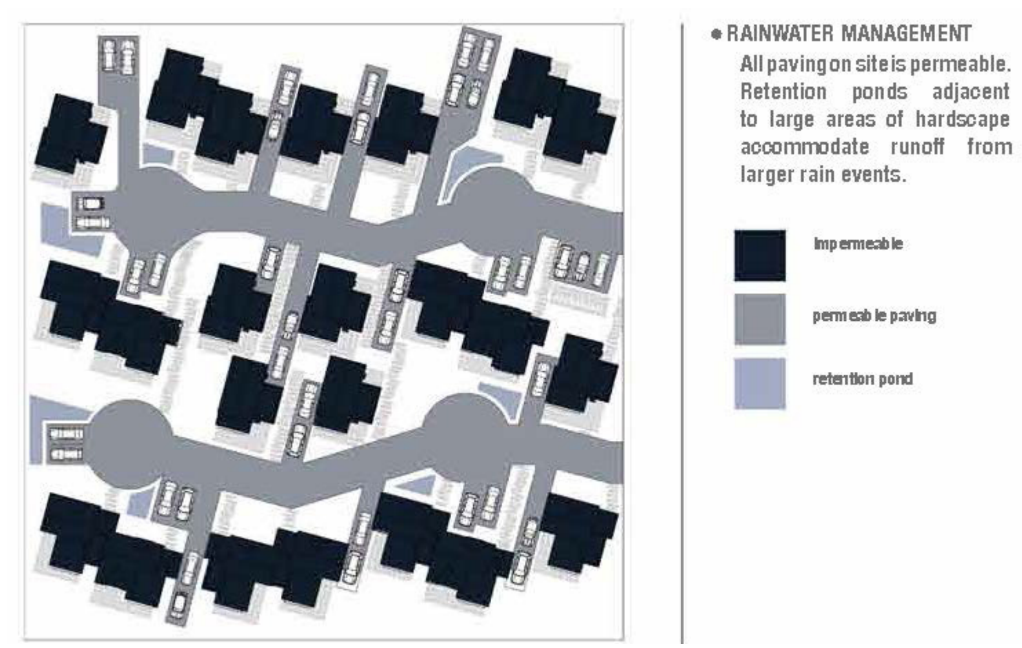


Figure 70: Diagram showing proposed stormwater mitigation strategies at Meadowlark Village infill site (Peter Hanley).

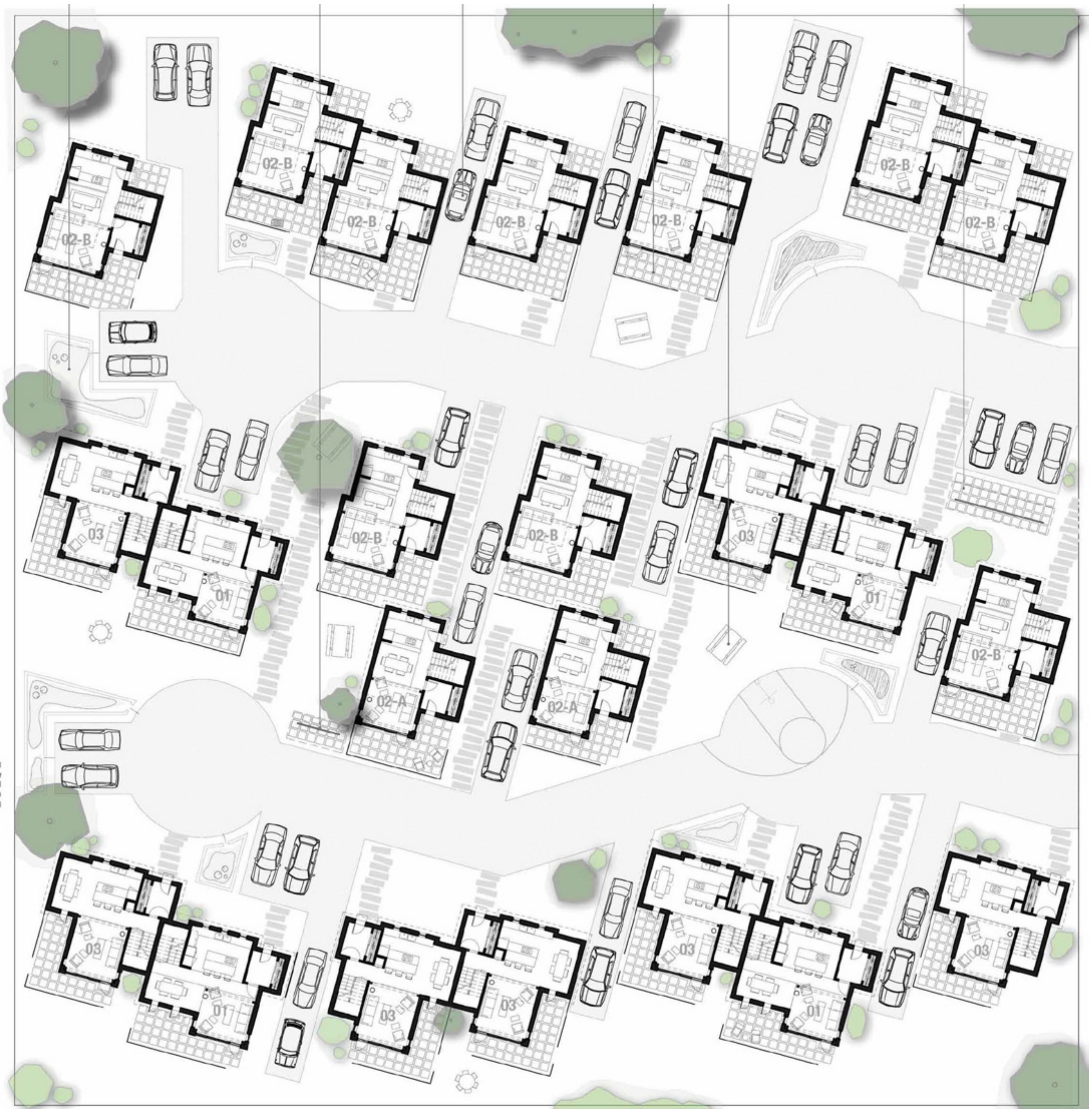


Figure 71: Proposed site plan including 23 single-family homes on the Meadowlark Village infill site (Peter Hanley).

In addition, each home enjoys private outdoor space that acts as a buffer space between the street and the home. The organization of homes around each cul-de-sac engenders an “eyes on the streets” form of community safety, whereby no portions of the infill site are left unseen. The streets are paved with permeable pavers and reduce polluted stormwater runoff. Small retention ponds, accommodating stormwater runoff from larger rain events or prolonged wet weather, border each cul-de-sac.

Proposing another infill strategy of 22 compact, semi-attached single-family homes, Andy Drake’s design creates many community-oriented spaces of different character. Implementing the site strategy of pocket neighborhoods, Drake’s proposal focuses the homes around appropriately scaled community spaces that provide an array of different amenities. The parking is arranged along the east edge of the infill site, using existing infrastructure, and a small street with limited parking enters through the middle of the infill site. Along the

Figure 72: Proposed site layout for Meadowlark Village, including common house for community use (Andy Drake).

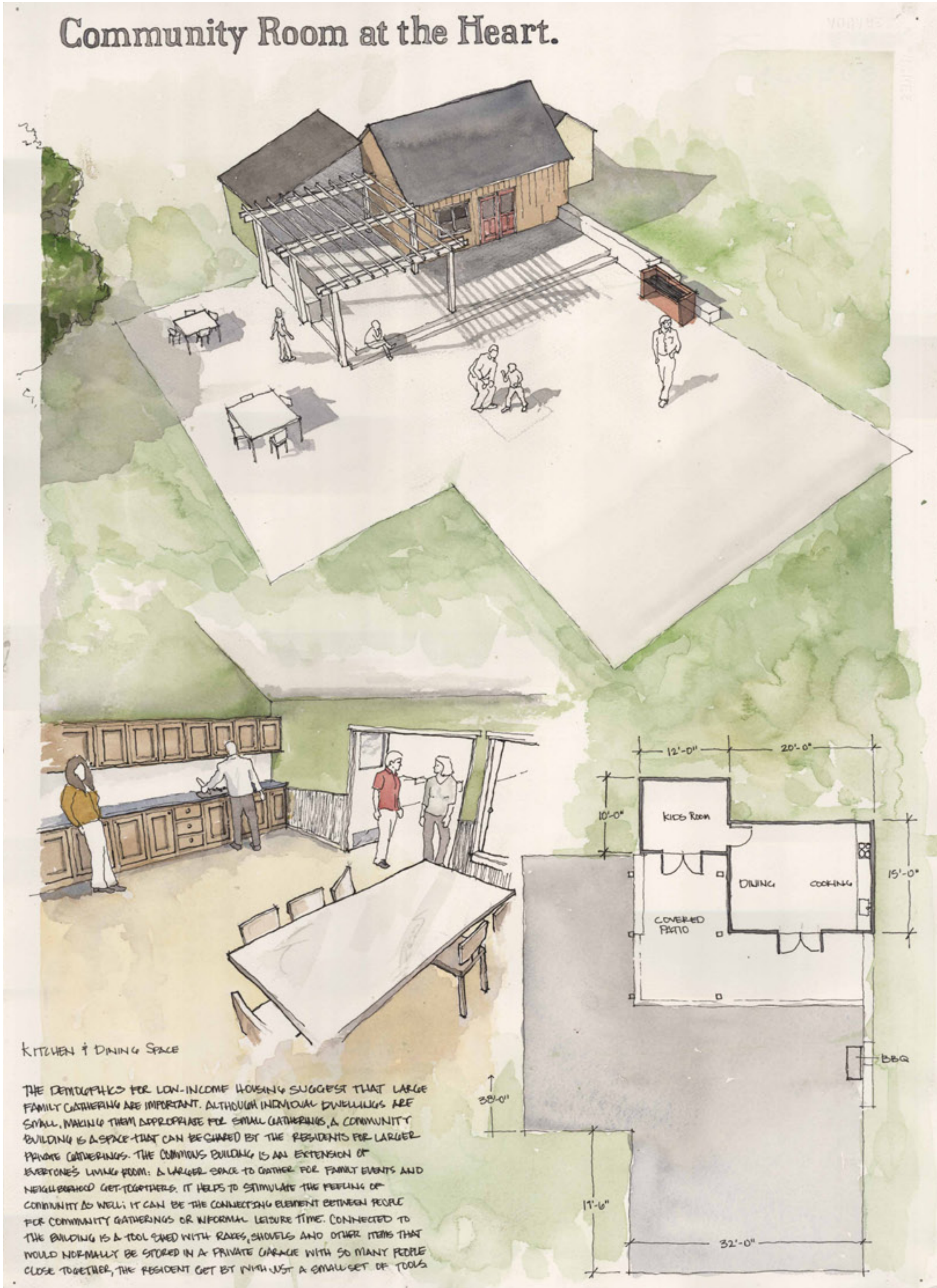


Figure 73: Exterior view and interior views of community building, showing covered outdoor space, kitchen facilities, and interior layout (Andy Drake).

south side of the street is a large outdoor space designed to accommodate a range of group gatherings and support informal interaction between neighbors. All parking spaces and mailboxes relate to the common space and the front of all the dwelling units face the commons, making it a safe place for children to play. The commons include both soft and hard surfaces, giving children and families a place to gather no matter the season. The common space is large enough for a gathering of the entire neighborhood, but remains comfortable for use by smaller groups or individuals.

The common space creates a gradient between public and semi-private spaces, using a series of transitions leading to privacy. Each dwelling unit has its own outdoor space that is decidedly more private, but it remains a part of the greater community space. These private outdoor spaces act as a soft edge

Figure 74: Proposed site layout for Meadowlark Village, including new housing and community building on the infill site and renovated existing housing with new community-use buildings (Kody Nathe).

Figure 75: Site cross-section showing common house in middle surrounded by new housing to the north and south (Kody Nathe).

for living spaces that look out directly onto the community space and provide a comfortable area for a bench or table.

A community building is located at the heart of the infill site, in view of the full extent of the site. It provides a kitchen and barbeque space, covered outdoor space, and storage for items such as rakes and shovels. The common building is a place for meetings between neighbors and can be used for large gatherings when individual houses would be too cramped.

Kody Nathe's proposal for the Meadowlark Village focuses on integrating community-oriented spaces within the infill development and existing housing. Nathe's proposal includes 25 units of new row housing on the infill site and an additional ten units of housing on the existing site. To engender community interaction and create a supportive community, Nathe used co-housing principles to guide the development of community spaces. In the infill site, the common house becomes a hub for the community, providing a large indoor-outdoor dining room, cooking facilities, living spaces, and guest rooms. The new common house connects the existing housing with the new housing and provides an alternative model of how community resources can ease the everyday burden of the individual household.

This concept is translated to the existing housing in the form of guest cottages that create pockets of outdoor spaces within the existing courtyard, thus encouraging ownership of the space and protecting privacy. Short-stay guests or long-term residents can use the cottages, depending on the needs of the community. This strategy increases density on the existing site and optimizes site use while providing an example of small-scale infill development.

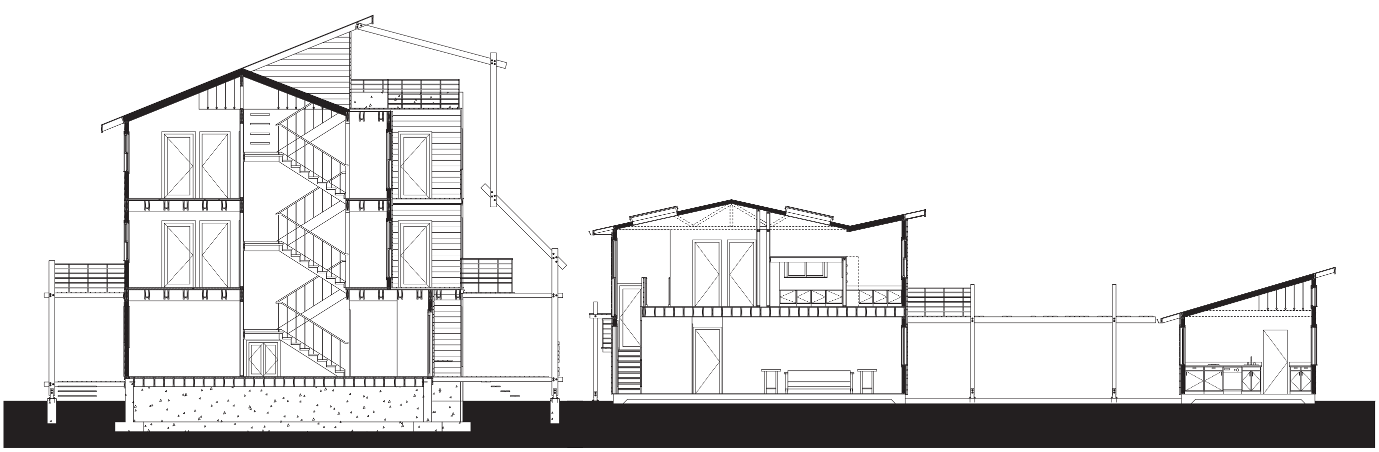


Figure 76: Cross-section view showing renovated existing 5 bedroom unit and new guest cottage creating a new, smaller scale courtyard patio within the larger existing courtyard, thus promoting ownership and protecting privacy (Kody Nathe).

Figure 77: Exterior view showing renovated existing units, new guest cottages, and new courtyard patio in between (Kody Nathe).

Glen Creek

A thoroughly suburban site with abundant open space, access to public parks, and a flowing creek, Glen Creek at first seems like an anomaly of public housing. The quality of the existing housing and the amount of existing infrastructure on site compelled the students to focus on how infill strategies can optimize the usability of the site. Working to the advantage of infill strategies, this nearly six-acre site is not densely built-up, and most of the existing infrastructure and facilities are clustered around the center of the site.

The existing conditions suggested infill strategies be focused around the periphery, where on the existing site constantly muddied grass bleeds into the overgrown riparian corridor. Focusing the site intervention around the periphery allows for significant influence over stormwater issues, as the center of the site is frequently waterlogged in the winter. As such, infill development on the periphery of the Glen Creek site has the ability to prevent the existing housing from getting “wet feet,” which can precipitate moisture, mold, and indoor environmental quality issues, and can increase the usability of the existing outdoor spaces.

In both of their proposals, Elise Mandat and Joanna Johnson emphasize the circular approach of the existing site by completing the street to wrap around the center courtyard. This gesture allows for a simplified one-way circulation pattern for automobiles while providing ample pedestrian connections to the entire site. Further, it supports their proposed infill strategies by reducing the infrastructure investment needed to accommodate cars. It also offers multiple points of access from which pockets of housing along the wooded, underutilized border of the site can be created.

The proposed site designs offer additional opportunities to implement inventive stormwater mitigation strategies and improve the quality of the outdoor spaces and circulation. Currently, grass covers the site. Grass needs to be mowed, is often dosed with herbicide to prevent unsightly weeds, and does a poor job of handling rainwater buildup. The placement of bioswales or rain gardens along the street surrounding the courtyards will create positive drainage patterns within the center courtyard while preventing polluted runoff from entering the watershed. These targeted interventions on the site can create focal points of beauty and seasonal expression. In addition, the use of native species can reduce irrigation and maintenance demands.

A major theme in the proposals for Glen Creek is the re-proportioning of the site to the human scale. The center courtyard, for example, currently attempts to provide a community amenity but is too large and undefined to support individual or small group activities; it ends up being an underutilized space. A bigger outdoor space is not always a better outdoor space, especially when it comes to providing outdoor space adjacent to individual dwellings. As the proposals above show, surrounding the courtyard more tightly with housing and circulation

Figure 78: Proposed site design and infill strategy on the Glen Creek site (Elise Mandat).

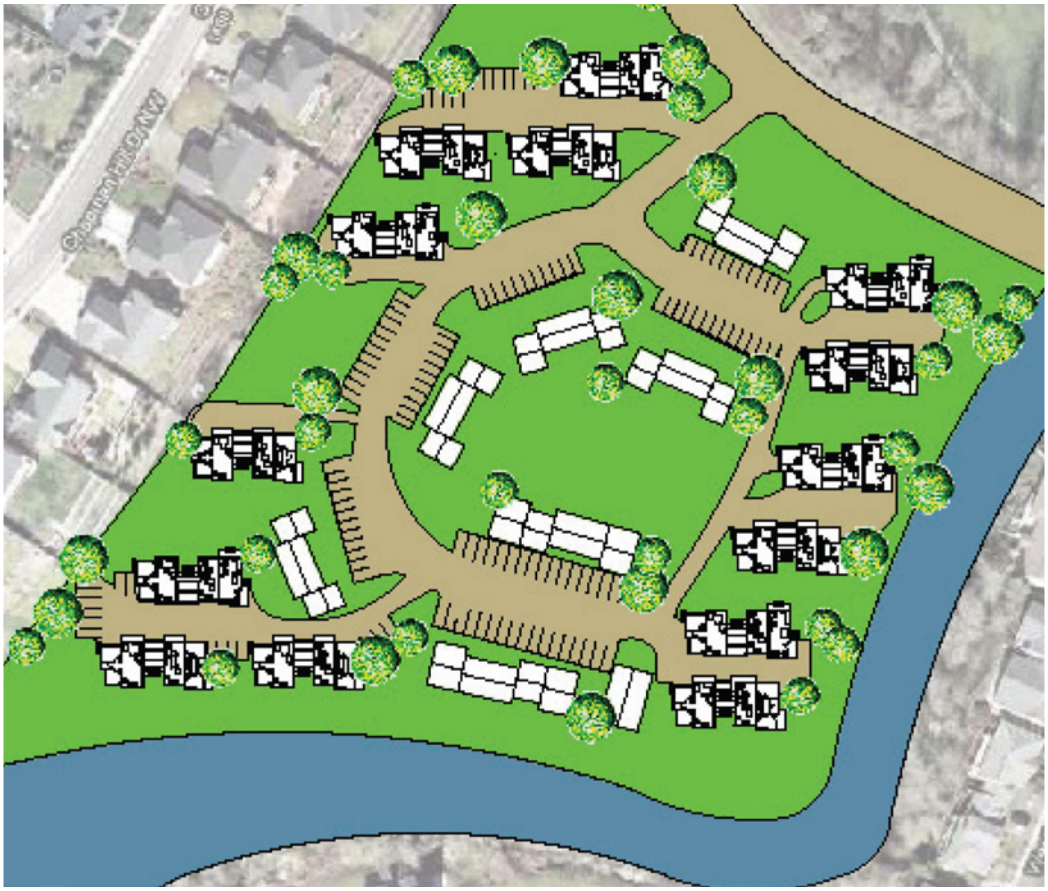


Figure 79: Proposed site design and infill strategy on the Glen Creek site (Joanna Johnson).

transforms the center into a versatile space able to be comfortably and safely played in by a few children or used for community-wide gatherings.

In addition, the presence of the courtyard offers an anchor from which new housing could be integrated into the existing site. It also allows new housing to be built more densely, as the improved utility of the courtyard will reduce

Figure 80: Exterior view showing south façade of infill unit at night and existing housing beyond (Elise Mandat).

demand for expansive private yards. These two elements work together to support the students' proposals for the layout of the new buildings on site, which again focus on the necessity for human scale design.

Figures 81 and 82: Exterior views showing hard and soft-scaped open space, shared parking, and shared stairway to access upper floor housing units (Joanna Johnson).

The existing townhouse units on Glen Creek are organized in five-unit buildings. Each building has small protrusions in and out, presumably meant to delineate individual units, but each building is basically rectangular. As such, there is little regard for the human experience of entering the unit or being outside of the unit, and the resulting buildings lack any semblance of individuality. The scale of the buildings is not the issue, but rather it is their articulation that creates this disconnect. The students were challenged to unite a site whose two opposing faces—the fronts of the units face the parking, and the backs of the units face the creek, playground, and courtyard—are articulated in the same exact manner. The non-descript treatment of the building edge results in privacy issues and creates a lack of individuality within the site that prevents occupants from feeling a sense of ownership.

Figure 83: Proposed infill cluster showing shared parking area and unit plans (Joanna Johnson).

In response, the students sought to provide a positive example of how housing at higher densities can promote the individuality and dignity of the occupants. The students' building proposals reflect the scale of the existing site and surrounding neighborhoods, opting to design two- to three-unit buildings organized in clusters of four or five units. Individual entrances are articulated to afford the occupants semi-private outdoor spaces where neighborly, informal interactions can take place. Mandat's proposal offers opportunities for residents to animate the building, with a façade that can open and close in response to the occupant's desire for privacy or connection. This begins to create an identity for the infill units, helping to balance the static nature of the existing housing. Mandat's proposed infill strategy adds 42 new units of housing to the Glen Creek site, more than doubling the existing site density.

The abundance of parking contained within the existing site reduces the need for additional parking and supports high-density infill strategies. This is shown in Johnson's proposal, which adds 70 new units of public housing to the Glen Creek site and increases the overall site density to 20 units per acre. The compact infill units are attached like row houses and include stacked one- and two-bedroom flats. Additional parking is provided, but copious open space is preserved. Johnson's proposal includes garages that are sunk slightly below grade. The land slopes up away from the front of the garage, creating an accessible entry from a green space on the other side of the unit. Raising the living space slightly above grade allows the infill units to move closer to the creek and inhabit the flood plain, thus increasing the density of the site and optimizing site use.

Conclusion

In collaboration with Peter Keyes's 2011 Advanced Architectural Design Studio at the University of Oregon and the Sustainable Cities Initiative, the City of Salem and the Salem Housing Authority sought to re-imagine the future of public housing so that it dignifies those who inhabit it and does so in a more economically, environmentally, and ecologically sustainable manner than is currently the norm.

The global and local recommendations contained herein provide a framework through which the City of Salem and the Salem Housing Authority can achieve these goals and promote high-density infill development, optimize energy use, optimize site use, protect and conserve water, and integrate community needs within market-driven realities. Only through an earnest evaluation of global contexts, local site constraints and opportunities, community interests, occupant needs, and demographic trends can the multi-faceted issues facing public housing be successfully broached. The students' proposals and recommendations exist as a product of approaching public housing design in this manner. The student design proposals for the Orchard Village, Meadowlark Village, and Glen Creek public housing sites display a range of strategies through which these goals can be achieved, proving there is no one catch-all solution and emphasizing the importance of experimentation and analysis in the design phase.

In this light, the Salem Housing Authority can choose to further explore the feasibility and impact of the recommendations contained herein with the confidence that these strategies can produce high-quality, affordable, energy-efficient, and socially responsible high-density housing well-suited to typical Pacific Northwest conditions.

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