The Art of Designing a Two- to Five-Acre Missing Middle Site Plan

Creating Value and a Sense of Place on Small Sites

By Daniel Parolek

Over the past several years, many clients have come to us wanting to explore Missing Middle Housing on two- to five-acre sites, which seem to be a "sweet spot" for Missing Middle application, especially for smaller developer/builders and for developers of sites within larger master plans. This scale is a sweet spot for Opticos because it allows enough space to work with a variety of creative types and building layouts, and to begin placemaking.

With these small sites, the challenge is often in creating a strong sense of place while generating value in sales or rentals. This is particularly important if the site is within a placeless context or a context that is still in the process of revitalizing or showing reinvestment, but has not yet gotten over the hump.

Similar to larger site planning efforts, this scale of Missing Middle site planning cannot simply be engineered, and the exercise cannot be simply about how many of a particular unit type we can squeeze onto a lot. There is an art to applying **Missing Middle types** to small sites. As a start, the site planner needs a strong understanding of the full range of Missing Middle Housing, including each type's lot size and layout parameters, in order

to effectively create a Missing Middle site plan. Which building types are interchangeable on the same lot sizes? Which types best hit different market segments? Can a type design be tweaked to meet specific site challenges? These questions (and more) frequently come up in the design process.

The project site, a former gas station across the street from an elementary school and a five-minute walk to the SMART commuter train. Image © Google/DigitalGlobe

To get the best results, this task typically requires **an architect with a strong knowledge of these types**. This is also not a simple exercise like applying types to individual lots or smaller sites, so you need to be sure to assume a higher site planning budget to get this right. To put it another way, you need to be willing to spend more for these site planning services than you would for an individual site application of each of these units.

Keep in mind that there is always a delicate balance between yield and placemaking. In our experience, we have found that we can usually generate a higher yield with a better plan and better unit types.

In this article, I am going to walk you through the initial evolution of a site plan that we created for a 2.7-acre brownfield site (a former gas station) in Novato, California and summarize the opportunities, challenges, type selection, and other aspects of the site planning effort. This case study will demonstrate the typical process for exploring Missing Middle at this small-site scale, examining different yields, different mixes of for sale and rental, fee simple versus stacked units, and a range of Missing Middle types on the same lot.

Assumptions for this project included:

- The client was initially open to exploring a full range of unit types (fee simple and stacked; for sale and rental) with an initial range of 1,600 to 2,100 square feet per unit.
- The required off-street parking was 1.5 to 2 spaces per unit with no additional visitor parking. This is a bit higher than we would like and does limit efficiencies, but this is a fairly isolated site.
- Maximum height of two to three stories based on zoning and context (perfect for **Missing Middle Housing**)
- No garages along streets—all alley loaded
- Style of the buildings in Spanish Revival as per local design guideline requirements

Step 1 – Conceptual Studies: Exploring various types within a shared framework

As a starting point for the plan, we explored the introduction of a new street and a detached green at the center of the site. This was only possible on a site this size because it is a corner site. For non-corner sites of this size (under three acres) it is not likely that you will be able to introduce a new street.

You might ask, "Why would we introduce a new street?" For one, it serves as an organizing element and creates a sense of place, with units fronting onto the street, rather than just a plan with little hierarchy or structure that feels like a bunch of units "crammed" onto a site. Most importantly, it also enables you to create high-quality addresses fronting onto the well-designed, tree-lined street, and it provides better access for residents, emergency responders, and visitors. Finally, it plants the seeds of walkability by introducing a pattern of interconnected streets to inform the redevelopment/evolution of adjacent sites into a more walkable neighborhood. This is particularly important because this area is transitioning from a military base, and new rail service is within a five-minute walk of the site.

In order to be effective at creating a strong sense of place on sites small or large, getting the street design right is critical and often not easy. A few key pointers:

- The narrower the street, the better;
- Be sure to include on-street parking—push the municipality to enable you to count this parking toward your required parking count; and
- Talk with local engineers and emergency response representatives at the very start of your project to get buy-in on narrow streets.

The size of the green in this framework is 4,380 square feet. This is a little small, but if a space of this size is thoughtfully designed with comfortable places to sit (possibly even with a small tot lot), it can be a great amenity for residents. The plan integrates the mail pavilion at the edge of the square, which makes a great place for residents to informally "rub elbows" with neighbors and creates a stronger sense of community.

To start, we generated a series of initial options for comparison.

Which Type Do I Choose?

Opticos has a robust and unmatched collection of Missing Middle building types that can serve as a solid starting point for a plan to test alternatives. Even better, we can also create custom building types to directly meet unique market demand or site conditions.

Forecourt Apartment

Custom Townhouse

Fourplex

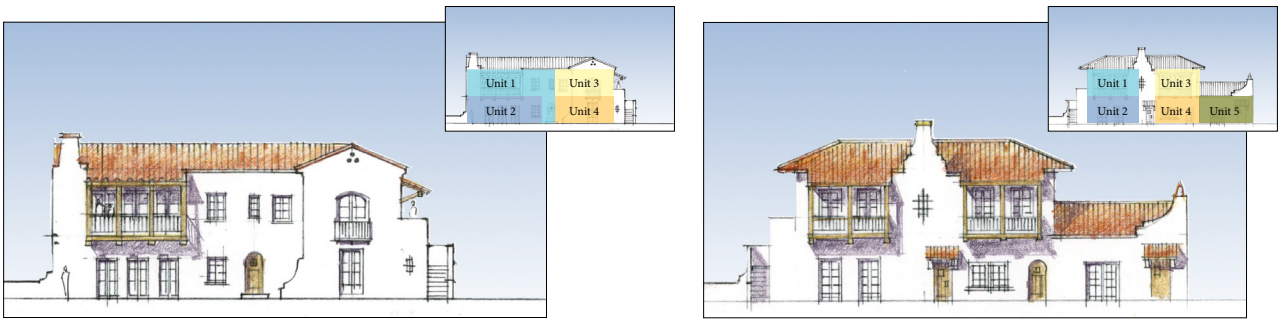
1-A: New, tree-lined streets and a shared community space are framed by the four- and five-unit mansion apartments. Live/work units engage the street corner. Parking is accessed from an alley.

Option 1-A: Mansion Apartments and Live/Work Units

We introduced three-story live/work units among flats to provide some walkability within the project and beyond, and to create an identifiable center at the edge of the project that could create a strong brand if a small cafe or coffee shop were to occupy one of these spaces. The ground floor space of one of the live/work units also functions as an excellent sales center or rental office. This option primarily integrates really nice, two-story mansion apartments—one type with four units and the other with five—that look like large homes.

Program Summary

- **Building Types:** Four- and five-unit stacked mansion apartments and live/work units
- **Program:** 41 units in ten buildings ranging in size from 720 to 1,168 square feet. Live/work units have 750 square feet of flex space on the ground floor
- **Density:** 15 du/acre
- **Parking:** 81 spaces (50 off-street spaces and 31 on-street spaces, or 1.98 spaces per unit). No garages; parking pads only off an alley
- **Open Space:** 4,380 square feet of community green plus tree-lined streets



1-A: A house-like four-unit mansion apartment (left) and a five-unit mansion apartment (right).

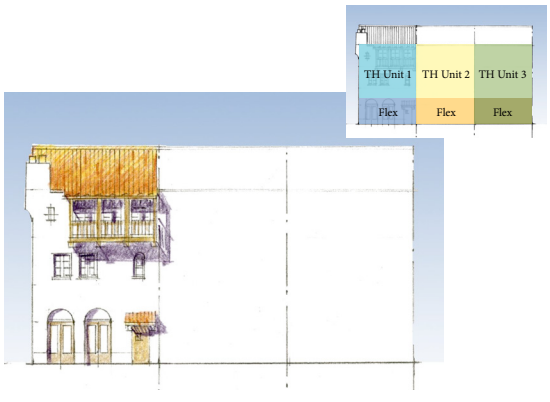
1-B: This scheme shares the same street network and community space, but the introduction of ground floor flex spaces in the live/work units creates a potential village-center-like atmosphere, thus providing a much-needed walkable center for surrounding residents.

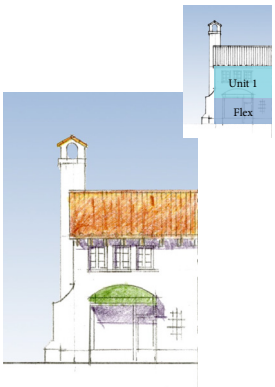
Option 1-B: All Live/Work

This option is possible because the site is not that large. There is nothing like it in the market, so it would have no competition and thus perform very well financially. Additionally, because it is along a fairly major roadway, it connects to a large community of potential users who have no other amenities in the immediate area. The challenge with this option would be lack of comps in the market to get conventional financing.

Program Summary

- **Building Types:** Two-story live/work units (with three-story option)
- **Program:** 31 units in eight two-story buildings. All units are 720 square feet, with 720 square feet of flex space. Units could be 1,440 square feet if buildings go up to three stories.
- **Density:** 11.5 du/acre
- **Parking:** 94 parking spaces (62 off-street spaces, 32 on-street)
- **Open Space:** 4,380 square *feet* of community green plus tree-lined streets





1-B: Live/work units above 720-square-foot flex space, including two-story and three-story options.

1-C: This scheme is the same as the previous option, with the addition of a 3,000-square-foot library at the corner. Note that there is no large parking area that would compromise the placemaking.

Option 1-C: Live/Work With Public Library

The only difference in this scheme and the previous is a small, 3,000-square-foot public library integrated onto the corner of the site, at the request of the City. A small public program like this is great to consider because it is a welcome community amenity, an effective way to create foot traffic for small businesses in live/work spaces, and a way to build goodwill that will likely make an entitlement process smoother. In essence, this scheme is creating a small village center. Note that integrating this type of public program is only possible if on-street parking can be counted toward required off-street parking, and the amount of required off-street parking is fairly low. Otherwise, integrating this program will likely compromise the economic viability of the site and the quality of the place. No one wants to live in housing that feels like it is in the middle of a parking lot.

Program Summary

- **Building Types:** Two-story live/work units (with three-story option)
- **Program:** 29 units
- **Density:** 10.5 du/acre
- **Parking:** 100 parking spaces, including 68 off-street spaces (with 10 for library) and 32 on-street
- **Open Space:** 4,380 square feet of community green plus tree-lined streets

1-D: The same tree-lined street network engaged by three-story townhouses, which front onto new and existing streets at edges.

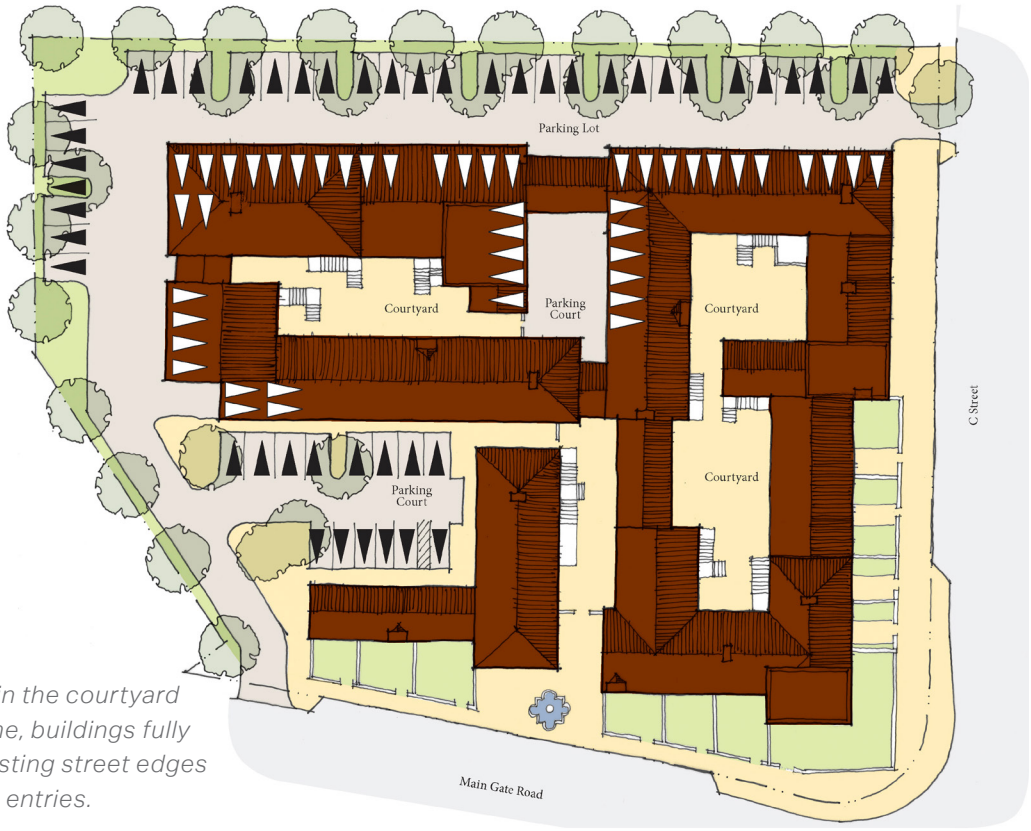
Option 1-D: Tuck-Under Townhouses

This alley-loaded tuck-under type is the lowest hanging fruit for most builders. In many instances, we encourage our clients to think beyond this type because a three-story unit with lots of stairs limits the range of potential buyers; lots of builders are building these types in most markets so there will be lots of competition; and these types do not create great urbanism because the ground floor is not very active, even if there is a room in front of the garage on the ground floor. That being said, with a good street and block network and careful placement and orientation, you can create a good place with these types—note that the fronts of the buildings face the street, and the sides and fronts of buildings (entries) never face the backs of other buildings.

Program Summary

- **Building Types:** Three-story, tuck-under townhouses
- **Program**: 34 total units, with three unit plans ranging in size from 1,167 to 1,624 square feet. (This height later became part of a compatibility conversation)
- **Density:** 13 du/acre
- **Parking:** 87 total parking spaces, including 56 off-street spaces and 31 on-street spaces (2.6 per unit). All 56 off-street spaces are in direct-access garages
- **Open Space:** 4,380 square feet of community green plus tree-lined streets

1-D: Fronts of buildings and entries with stoops engage the street. Balconies create a visually interesting composition.



1-E: Even within the courtyard housing scheme, buildings fully engage the existing street edges with fronts and entries.

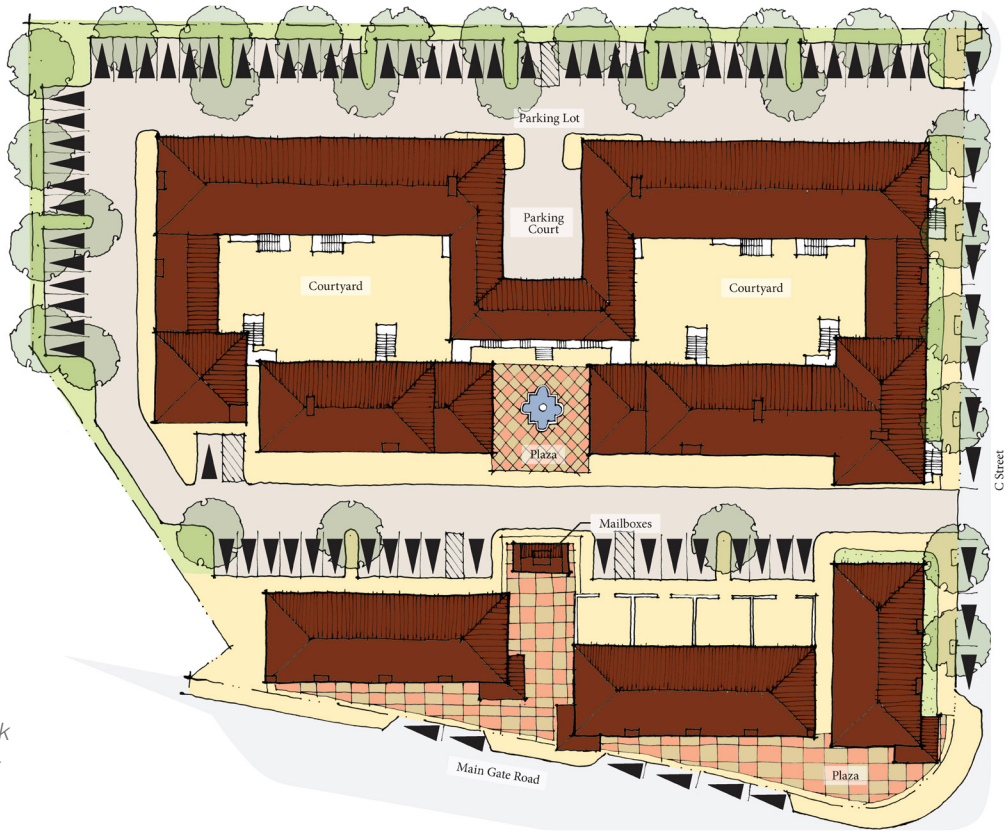
Option 1-E: Courtyard Housing

We also explored some initial options that did not use the shared framework. In this option, a courtyard housing layout proposed quaint, two-story buildings enclosing a series of three courtyards. A paseo goes north-south through the site, with a small forecourt/plaza with fountain at the street edge. Even at just two stories, this generated higher yields than many of the previous schemes.

Program Summary

- **Building Types:** One- and two-story courtyard housing with live/work units at corner
- **Program:** 40 units, with five unit plans ranging in size from 576 to 1,728 square feet. Units are one- to two-story and stacked, so they could be rental or condo
- **Density:** 15 du/acre
- **Parking:** 92 on-site parking spaces, including 46 enclosed and 46 open (two per unit plus four per 1,000 square feet of flex space and for guest parking)

1-E: Street elevation with varied massing and live/work unit with the corner passageways leading into courtyards and stoops leading up to units.



1-F: This scheme splits the courtyard housing to the rear of the site, with the live/work units at the front along the street.

Option 1-F: Courtyard With Live/Work Along Primary Street

Another option that did not use the shared framework, this scheme has the same two large courtyards to the northern edge of the property, but introduces live/work units along the main street on the site's south edge. This scheme generates the highest yield of all schemes, partly due to lower parking ratios.

Program Summary

- **Building Types:** Courtyard housing with live/work units at front along street
- **Program:** 58 units, ranging in size from 576 to 1,728 square feet. Units are one- to two-story and stacked, so they could be rental or condo
- **Density:** 22 du/acre
- **Parking:** 110 off-street spaces, 36 are tandem

1-F: At top, a live/work elevation with central paseo leading into the site. At bottom, a side elevation with live/work units to the left and courtyard housing to the right.

Step 2: Site Plan Refinements with Client's Preferred Type & Navigating the Design Review Process with the City

The preceding schemes produced a range of discussion items—including the amount of open space, for sale or rental options, viability of live/work, and tradeoffs between yield and placemaking—and informed some key decisions.

This is a simplification of the actual process, but at this stage the client selects a preferred alternative, type or mix of types, and we generate several refined alternatives to which the client can respond.

At this point, our client selected the tuck-under townhouse type. This decision was primarily made because our client decided to sell the site after getting the entitlement and felt that would be the easiest option to sell to another builder even though the yields were not as high as other types.

To site plan effectively with the tuck-under townhouse type, we used custom, three-story unit plans—three, to be precise, and none of which were generic—to generate building footprints, and we put forth the following options.

Custom, detailed unit plans for the preferred building type—the tuck-under townhouse—allowed us to create site-specific building footprints from which we could site plan (1 of 3 complete unit plans shown.)

Some General Tips: Moving from Conceptual Studies to Preferred Design

- Check with utilities about required front setbacks and ability to place utilities in alleys
- Make sure to plan for trash pick up
- Understand mail delivery parameters
- Start a conversation early with local engineers and emergency response representatives about street and alley design and general layout considerations to avoid surprises
- Hire a consultant who can produce a Target Market Analysis that clearly defines the type of Missing Middle that there is demand for in the community you are building within
- Understand design review parameters, engage the design review committee members as early as possible, and engage them individually if the City allows it

2-A: This scheme attaches the green on two sides.

Option 2-A: Attached Green With Shorter Internal Street

In this option, we studied attaching the green on two sides and making the green bigger—18,500 square feet rather than 4,380 square feet in the previous schemes. We still retained an L-shaped internal street; this was only possible because it is a corner site.

There are a few Issues with this direction, including;

- Loss of the potential for future connectivity to site to the north;
- Less direct access for potential customers to uses within the live/work units, thus making their viability more challenging;
- Emergency access is more complex and challenging; and
- If biking or walking, you would need to go out to a busy road, versus staying on smaller, local streets as you could in the previous scheme.

That said, on a site this small, giving up the street was not as big of a compromise for us.

Program Summary

- **Building Types:** Tuck-under townhouses: a two-story type along the edges and two three-story types internally
- **Program:** 31 units, ranging in size from 1,700 to 2,100 square feet
- **Parking:** 83 total on-site, 62 off-street and 21 on-street—not including adjacent on-street parking

2-B: This scheme removes the site's street network, replacing it with alleys that run behind units. Importantly, the fronts of units face the green and other units, and the backs face the alleys.

Option 2-B: Completely Getting Rid Of Internal, Neighborhood Street

You have to be really, really careful about the decision to remove the streets. On sites of five plus acres, we will push hard to keep an internal street, but with a site this small, you are not really losing a lot of connectivity. On this site, it allowed us to further Increase in green size, from 18,500 square feet of 21,860 square feet, and changed the development model to more of a pocket neighborhood rather than a typical neighborhood with units oriented along a pedestrian-scale street.

An important note that should be true of all site plans, regardless of size of site, is that fronts face fronts and backs face backs on all buildings, and fronts of buildings address the adjacent streets. This is key to a good site plan.

A few other points to consider are:

- The alleys need to be narrow. The visual and physical "breaks" along street edges are minimized by narrow alley design and pushing buildings up to ROW of alleys.
- Orientation and engagement of the street frontages should be carefully considered even though most of the units are oriented internally onto the green.
- The entry into the square/green is off of the main road with a mail pavilion.

Program Summary

- **Building Types:** Tuck-under townhouses: two building plans are three stories and a third is two stories to put along the edges
- **Program:** 31 units, ranging in size from 1,700 to 2,100 square feet. *(Note: No units gained by removing the street, only gained open space)*
- **Parking:** Two direct-access garage spaces per unit; 79 total spaces on-site: 62 open and enclosed, 17 uncovered. Loss of four spaces, not including adjacent on-street parking

In the final design, the green and units remained similar to the previous scheme, with some refinements to building height and program, among others.

Step 3: Final Client Adjustments Based on Market Shifts and Final City and Community Requests

Over the course of time this was being approved, the market shifted dramatically toward wanting/needing smaller units and being okay with stacked units. Construction costs also increased, and the community and Design Review Committee (DRC) continued to push back against any three-story buildings. We were directed by our client to make the following changes while keeping the plan as close to the previous plan as possible:

- Introduce smaller units. This enabled us to hit two birds with one stone. We made the community and DRC happy because we brought all unit heights down to two stories, and it also allowed us to create more attainable units for buyers or renters.
- Introduce a few flats into the project. This also allowed us to create more attainable units for buyers and renters.
- Introduce a 275-square-foot wing on a few buildings that can serve as an ancillary unit.

Final Program Summary

- **Building Types:** Five different unit types
- **Program:** 33 units, ranging in size from 880 to 1,622 square feet (1-3 bedrooms)
- **Parking:** 77 total on-site spaces. 58 off-street and enclosed; 19 uncovered

Elevations showing final, two-story townhouses with smaller units.

Final Thoughts

You would think planning a 2.7-acre site for Missing Middle would be simple, but to truly capture value and create a great place, you need to set aside the time and budget to hire the right professional to enable you to get it right—a designer with an eye for balancing yield, parking access, public space, and placemaking, and one who has an intimate knowledge of a variety of building types, or even custom types.

About the Author

Daniel Parolek is an architect with a passion for helping people design and plan better communities. A foremost expert on **Missing Middle Housing**, Dan is focused on developing housing that meets the needs of a changing demographic audience and allows builders and developers to target their projects for the widest possible range of buyers. Call (510) 558-6957 or email **marketing@opticosdesign.com** to set up a free 30-minute phone consultation.

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