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DATE: June 15, 2020
TO: Matt Hastie and Kate Rogers, Angelo Planning Group
CC: Ethan Stuckmayer, Department of Land Conservation and Development
FROM: Becky Hewitt and Tyler Bump, ECONorthwest
SUBJECT: Summary of Triplex/Fourplex Financial Feasibility Sensitivity Testing for Middle Housing Model Code

Introduction

As part of the consultant team led by Angelo Planning Group (APG), ECONorthwest is advising on development feasibility for the Middle Housing Model Code project. This memo summarizes ECONorthwest's analysis of select model code provisions applicable to triplexes and quadplexes. We evaluate the potential impacts these model code provisions have on development feasibility under a range of market conditions. The intent of the analysis is to assist the project team and Model Code Technical Advisory Committee (MCTAC) in refining the triplex and quadplex standards in the draft Large & Metro Cities Model Code (LMCMC).

The model code provisions selected for analysis are those expected to have the greatest potential impact on development feasibility for triplexes and quadplexes, and which were the subject of the most discussion during MCTAC meeting 5. These topics include:

- Minimum off-street parking requirements
- Minimum lot size
- Floor area ratio (FAR)

This memo summarizes the approach to the analysis, the assumptions underlying the sensitivity testing, and the results and findings from the analysis.

Approach

Site and Building Variations

This analysis was limited to triplexes and fourplexes. Our analysis tested a range of lot sizes, parking options, and floor area ratios in various combinations. Based on direction from APG, we limited the range of development standards we tested to options currently under consideration by the MCTAC, including:

- **Minimum lot size**: 3,000 sq. ft.; 5,000 sq. ft.; 7,500 sq. ft.; 10,000 sq. ft. (assumed to match minimum lot sizes for single-family detached homes in the zone).
- **FAR**: 0.6, 0.7, and 0.9 (higher FARs tested only on smaller lots).
- **Parking**: two surface parking spaces (behind building), one driveway space (in front setback), two garage spaces with driveways, one garage space with driveway, and no dedicated parking (on-street only).

SERA Architects provided "test fits" to confirm whether the parking and FAR options would be physically feasible on various lot sizes. We did not test combinations that were identified as infeasible based on physical constraints.

We also did not evaluate remodel / conversion of existing housing units into triplexes or fourplexes or the addition of housing units to a property while retaining an existing home, as these situations are even more highly variable and difficult to predict at this scale. A 2016 report by DECA Architecture as part of Portland's Residential Infill Project highlighted the challenges associated with conversion to a triplex or fourplex: [1]

> *"Conversion of a single family house into three or more units often involves navigating complex and/or challenging issues such as:*
>
> *-Transition from the residential to the commercial building code*
>
> *-Changes in occupancy from single family to apartments*
>
> *-Upgrading walls and floors/ceilings to achieve fire ratings*
>
> *-Upgrading walls and floors/ceilings to achieve sound ratings*
>
> *-Reducing exterior wall openings to meet commercial code*
>
> *-Adding fire sprinkler systems*
>
> *-Addressing ADA and accessibility issues*
>
> *-Seismic upgrade standards*
>
> *-Energy efficiency requirements"*

Variation in Market Conditions

Due to the wide variation in market conditions and land costs statewide, we used three different sets of market conditions to illustrate a range of possible outcomes around the state, using representative financial inputs for each set of market conditions:

- **Cool**: slow population growth, low land cost, low rent & home sales prices.
- **Warm**: moderate population growth, moderate land cost, moderate rent & home sales prices.
- **Hot**: rapid population growth, high land cost, high rent & home sales prices.

[1] The study noted that "conversion of a single family home into a duplex (two dwellings) can often be achieved quite readily and without complex or costly upgrades."

DECA Architecture, "Residential Infill Project Internal Conversion Report," October 17, 2016; page 2.

While this approach still oversimplifies the range of potential market conditions, it provides better insights than using a single set of market assumptions that represents a midpoint for the state as a whole. It's useful to think about market conditions as a continuum with a lot of local variation. We have chosen three illustrative examples to help highlight how results might vary in different places. The example market conditions we used were calibrated based on example communities in each category where ECONorthwest has done recent market analysis relevant to middle housing.

Evaluating Feasibility

For the purposes of this analysis, we limited our evaluation of feasibility to development of rental housing because the current Model Code standards and definitions for triplexes and fourplexes do not allow for dividing the lots to provide fee-simple ownership of individual units. While condominium ownership is possible and there are precedents for this, it is less common than rental for triplexes and fourplexes for several reasons:

- Condo development is subject to construction defect liability rules that make it riskier and more expensive for developers and contractors.
- Buyers tend to prefer fee-simple ownership, especially in a neighborhood context (vs. an urban high rise), because the condominium association adds complexity.
- The legal process to create condominiums is complex and expensive enough that it can be burdensome for developers to building just a few units.

Our approach to evaluating feasibility for rental housing considers whether a given development option could generate a sufficient return through the net rental income to justify the costs of new construction and to cover loan payments with a reasonable margin. (Our specific financing assumptions are provided on page 6.) For the purposes of this analysis, we have calculated the net cash flow that the owner or equity investor would receive—the remaining revenue from rents after accounting for vacancy, operating expenses, and loan payments—in the first year the project is complete and fully leased up as a percentage of the equity investment required to build the property. This is sometimes referred to as the "cash-on-cash" return. It is a relatively simple approach to understanding feasibility that does not account for long-term appreciation of the property, rent and operating expense increases over time, income tax benefits associated with owning rental property, or other factors. However, this simpler approach reasonably represents a first pass "does this pencil?" test by a potential developer, when determining whether to pursue something further and before refining the analysis to account for those additional factors.

It is also important to note that demand and need for a given housing type do not necessarily translate into financial feasibility. If the rents that households who might choose that housing are willing and able to pay are too low to support the costs of new construction, development will not be feasible without government assistance.

Assumptions

Our analysis uses typical and reasonable estimates for costs, rents, and expected financial returns. Individual circumstances can vary widely based on site, jurisdiction, and developer-specific variables. Thus, our analysis does not represent an absolute indication of feasibility, but rather a rough estimate of how feasibility might vary with changes to development standards and market conditions.

One simplifying assumption that warrants further explanation is related to land costs. On a per square foot or per acre basis, land costs will tend to be higher where higher densities are possible. (Actual land costs can vary substantially based on the desirability of the location, the extent of site and infrastructure improvements needed, etc.) In zones that largely allow single-family housing, developers of triplexes and fourplexes will be competing for land with developers of single-family homes. If a triplex or fourplex requires the same land area as a single-family home, then a triplex or fourplex will need to generate financial returns that are roughly on par with the returns from building one single-family home in order to compete for that land. However, if a triplex or fourplex requires as much land as 2, 3, or 4 single-family homes, it must compete with the financial returns that those homes would generate in total. To account for this without adding substantial complexity to the analysis, we assume a constant cost per buildable home site that meets the minimum lot size for a single-family, detached home. Thus, the key driver of land cost for a triplex or fourplex is the amount of land required relative to what is needed for a single-family home.

Development Costs

Our cost assumptions are based on past developer and contractor interviews and research on costs in a few example jurisdictions.

Item	Assumption	Notes
Hard Costs	5% less in cool markets	Past work has indicated little variation in construction cost in different parts of the state for larger development projects in particular. For purposes of this analysis, we assume a slight reduction in construction costs in cooler areas for small-scale development; however, remote communities with cool market conditions may face costs higher than those in warm and hot markets if skilled labor is not available locally.

Item	Assumption	Notes
Construction Cost of Units	\$113-\$155 per sq. ft. for projects that can meet residential building code; \$120-\$165 per sq. ft. for projects subject to commercial building code[2]	Costs assume mid-level finishes. Actual construction costs can vary widely depending on project design, materials, and finishes. However, many developers and contractors indicate smaller units tend to cost more on a per square foot basis because spaces like kitchens and bathrooms cost more than bedrooms and other habitable space. Larger units often have more of the floor plan devoted to lower-cost space. For purposes of sensitivity testing the impact of different code standards, we hold finish level constant, but approximate variations based on unit size.
Cost of Garage Space	\$35 per sq. ft.	Lower cost due to unconditioned / unfinished space. Translates to just under \$10,000 for a one-car garage.
Cost of Driveways & Surface Parking	\$10 per sq. ft.	Translates to roughly \$2,500 for a one-car driveway.
Lawn & Landscaped Areas	\$2 per sq. ft.	Actual costs can vary widely based on the landscaping selected, but assumption is a mix of sod and limited higher-cost landscaping (e.g., shrubs).
Soft Costs		
Architecture & Engineering	\$30,000-\$40,000	Includes plans, design, engineering, survey, and other professional services. Often quoted as a percentage of hard costs. However, when looking only at triplex and fourplex development, costs are likely to vary little with total construction cost and more with site- and development-specific factors. Assumption is \$30,000 for a triplex and \$40,000 for a fourplex. Fully custom plans, challenging sites, or other issues could substantially increase costs.
System Development Charges, Construction Excise Tax, etc.	Cool markets: \$8,400-\$12,250 per unit Warm markets: \$12,000-\$17,500 per unit Hot markets: \$21,000-\$30,625 per unit	System Development Charges (SDC) rate structures can vary substantially between jurisdictions. Water and sewer SDCs often scale to some degree based on unit size (e.g., number of plumbing fixtures) while other SDCs may or may not vary with unit size. Warm markets were calibrated using Corvallis's fee estimator, while cool and hot markets were adjusted up or down to account for the fact that jurisdictions tend to charge only what development can bear in that area even if they can legally charge more.
Utility Hook-Up Fee	\$3,000	Varies from jurisdiction to jurisdiction, but typically costs several thousand dollars per connection (would be roughly same cost for triplex as fourplex – does not vary with the number of units).
Permit Fees	1.5% of hard costs	Calibrated based on information from Corvallis.
Developer Fee / Overhead	4% of total development cost	Covers the developer's cost to manage the project, not profit / financial return on the investment.

[2] Triplexes and fourplexes are typically subject to commercial building code standards, unless they can meet the building code definition for townhouses, which requires units attached side-by-side, but does not require units to be on separate lots. For purposes of this analysis, we assumed that combinations of development standards that allow an average unit size of at least 1,000 square feet could plausibly be configured with side-by-side units (not necessarily facing the street) and applied the lower construction costs to these situations.

Item	Assumption	Notes
Land Costs		
Cost per Buildable Single-Family Lot	Cool markets: $50,000 Warm markets: $100,000 Hot markets: $225,000	See discussion above. Assumptions are calibrated to fall within a range of prices observed for land sales in several example communities. Actual land costs can vary significantly with site-specific factors.

Revenue and Operating Expenses

Item	Assumption	Notes
Rent	Cool markets: $0.85-$1.75 per sq. ft. Warm markets: $1.05-$2.30 per sq. ft. Hot markets: $1.22-$2.85 per sq. ft.	Actual rents will vary significantly based on locational amenities, finishes, and unit size. For purposes of this analysis, we hold locational amenities and finishes constant and focus on unit-size variation. In cooler markets, there is less demand for very small units, and also less of a market for large units with higher rents. The rent ranges are intended to be illustrative of potential conditions around the state rather than precisely calibrated to a specific area. The lowest end of the range reflects large units (over 2,400 square feet), while the highest end reflects very small units (under 480 square feet).
Additional Revenue for Parking	Cool markets: $0 for surface / driveway, $10 per garage space Warm markets: $10 per surface /driveway space, $25 per garage space Hot markets: $25 per surface /driveway space, $50 per garage space	People in some areas may be willing to pay more in rent for garage or surface parking space whether parking is rented separately or included in the rent. This is more likely in denser areas, which tend to be warm or hot markets. These rent assumptions reflect the increase in rent per month associated with providing off-street parking.
Vacancy	5%	
Operating Expenses	32% of revenue	This is a standard, simplified assumption for multifamily rental housing.

Financing and Return Assumptions

Item	Assumption	Notes
Maximum Loan Amount	75% of total development cost	Actual loan terms will depend on the details of how the project is being financed, the developer's track record, and the riskiness of the project. These assumptions are intended to reflect a reasonable financing scenario for small-scale development.
Interest Rate	4.75%	
Loan Term	30 years	
Required Debt Service Coverage Ratio	1.25	

Item	Assumption	Notes
Cash-on-Cash Return Requirements	Cool markets: 5% Warm markets: 6% Hot markets: 7%	Actual return requirements for equity investors will depend on a variety of factors specific to the developer and the project. We assume those investing in a cooler market (who are likely to be locals for rental properties of this scale) will have to be willing to accept a lower return than those working in a hot market. However, returns below 5% may not meet required debt service coverage ratios to secure a loan.

Results and Findings

This section summarizes our results and key findings from our analysis by topic.

Part 1: Impact of Parking & FAR by Lot Size

This analysis tests how variations in floor area ratio and parking (i.e., surface, garage, or on-street only) affect feasibility on a range of lot sizes. Note that in Part 1 of the analysis, we assume that the lot sizes tested are the same as the lot size for single-family homes in the zone and look at lot size only as a way to understand how the parking and building size vary with lot size. (Part 2 tests the impact of lot sizes that are larger than the minimum for single-family detached housing in the zone.)

Key Findings: Unit Size and FAR Impacts

FAR, lot size, and parking requirements interact with each other to determine the amount of floor area that can be built on the site, which drives the unit size. Unit size is an important driver of rents and costs. The optimal size range will vary by jurisdiction depending on market conditions and how costs (e.g., fees and SDCs) scale with different unit sizes. However, we observed several trends related to unit size:

- Within the range of standards tested, when the lot size for triplex/fourplex is the same as the minimum for single-family detached homes, the differences in feasibility are mostly driven by differences in the potential rent vs. development cost at different unit sizes. (See Exhibit 1 and Exhibit 2 on page 9.) **Very small units generally showed low financial returns**, though the threshold for fourplexes was lower than that for triplexes:
  - Fourplexes: Average unit sizes under about 700 square feet generally were not feasible.
  - Triplexes: Average unit sizes under about 850 square feet generally were not feasible.
- **For small lots, a higher FAR is important for allowing units that are both physically and financially feasible.**
- In some cases, we see decreasing returns to scale with larger unit sizes. For example, with some prototypes, larger units without garages show lower returns than smaller units with garages. However, developers do not have to build to the maximum FAR

allowed. Consequently, **higher FAR allowances do not necessarily create problems for feasibility, but they may not help past a certain point in some markets**.

Key Findings: Parking Impacts

Our analysis shows that **the cost of providing parking (up to 2 spaces in total for a triplex or fourplex) is not in itself a major issue for feasibility.** The returns for prototypes with 2 off-street spaces are generally only slightly below those with no parking if the average unit size is roughly the same. **However, the space dedicated to parking can be an issue if it limits building size.** If more parking spaces were required than we tested (e.g., 1 space per unit), this would have more impacts on the possible building footprint and could trigger regulations that require more circulation area (e.g., requiring a turnaround area so that cars do not back out of the driveway). **On small lots, even requiring more than 1 parking space per development creates feasibility issues because it limits the potential building footprint**.

Garages may limit the impact on building footprint, but if they count toward a limited FAR allowance, they take up too much of the limited floor area for a smaller development to make sense in most cases. Since garages are not required—although in some cases they reduce the estimated financial returns—a developer could choose surface parking if that offered a better return and was physically feasible on the site.

Other Findings

- **Triplexes generally show lower returns than fourplexes**. Although they enable somewhat larger units, some of the fixed costs (e.g., land) are spread across fewer units. Triplexes may only be able to meet targeted investment returns for a few regulatory scenarios in any given market.
- **Triplexes and fourplexes will likely be challenging to develop in cool markets under any of the regulatory scenarios tested.** The lower financial returns anticipated in these areas will likely mean a smaller pool of potential builders and investors and challenges securing financing.

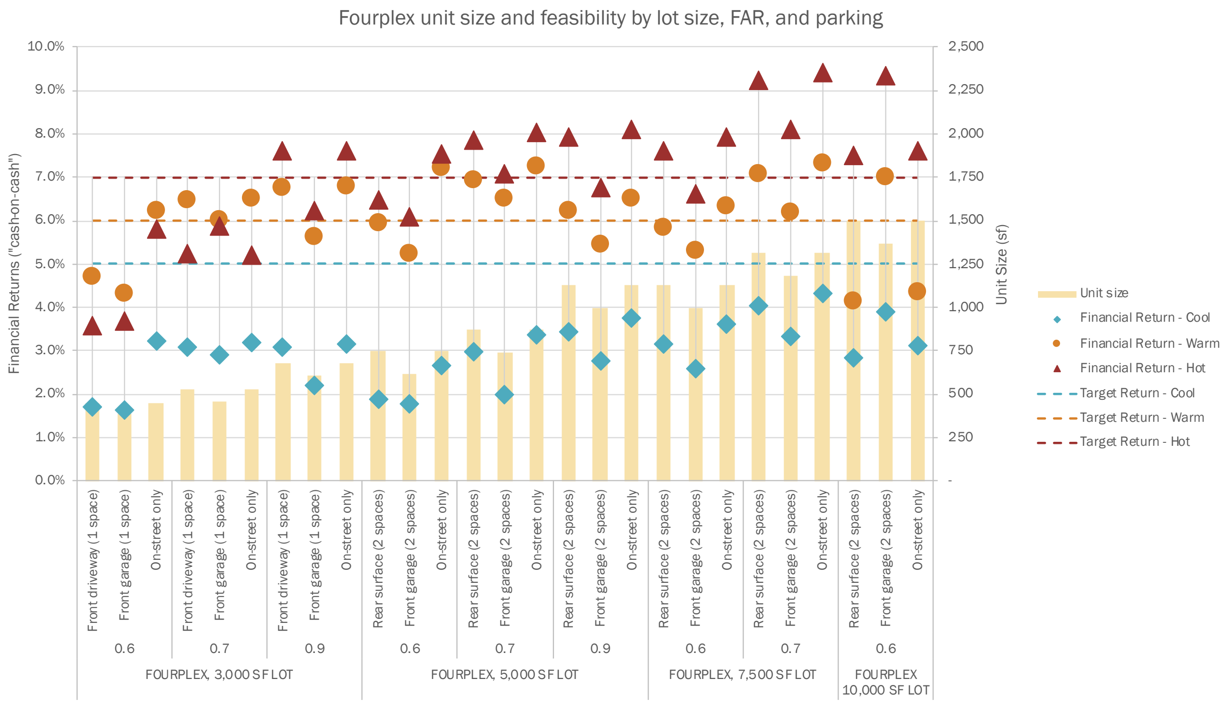
Feasibility Results by Regulatory Scenario

Exhibits 1 and 2 on the following page show the following for each regulatory scenario (i.e., each combination of lot size, FAR, number of units, and parking that we tested):

- Maximum average unit size (pale yellow bars).
- Estimated financial returns for each set of market conditions (blue diamonds for cool markets, orange circles for warm markets, and red triangles for hot markets).
- Target financial returns for each set of market conditions (blue dashed line for cool markets, orange dashed line for warm markets, and red dashed line for hot markets).

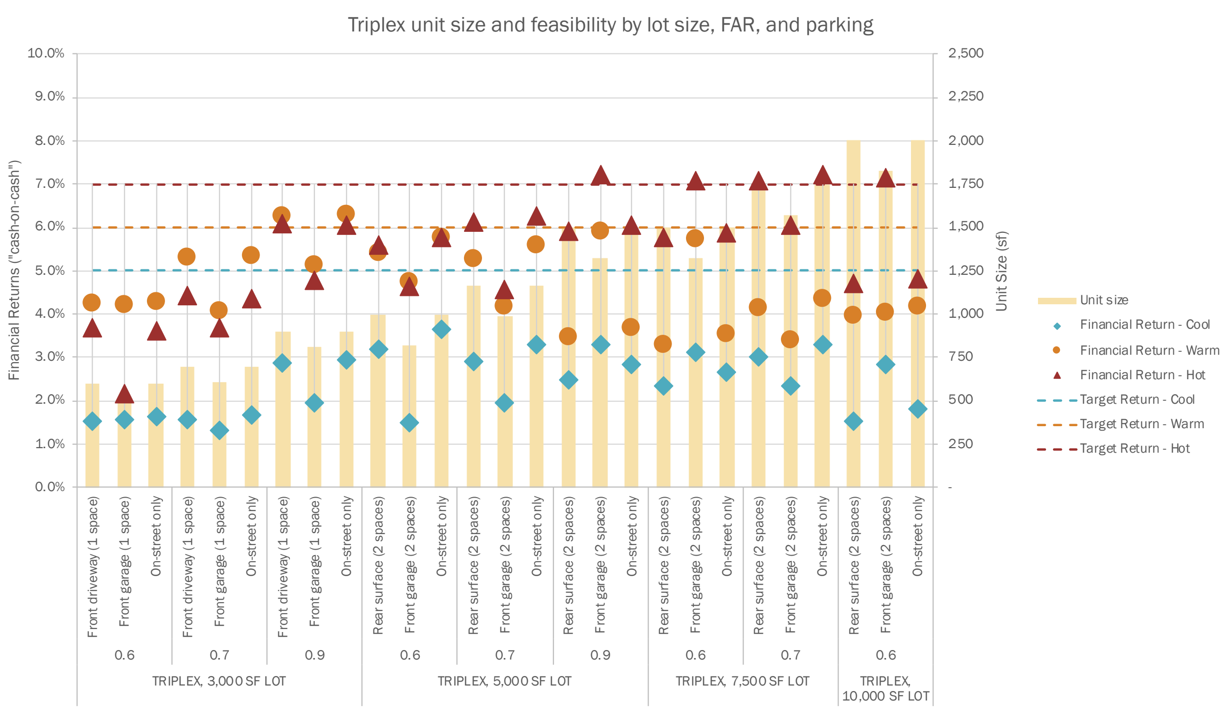
Where the estimated returns exceed the target returns for that market (shown as the marker being above the dashed line of same color), this indicates a greater likelihood of financial feasibility for that development. **This analysis is intended to provide a rough indication of** feasibility challenges, not to provide a precise calculation of the feasibility of a specific situation.

Exhibit 1: Fourplex Results Summary by Lot Size, FAR, and Parking



Source: ECONorthwest

Exhibit 2: Triplex Results Summary by Lot Size, FAR, and Parking



Source: ECONorthwest

Part 2: Impact of Minimum Lot Size Relative to Single Family Minimum

In Part 2 of our analysis, we compared the 5,000, 7,500, and 10,000 square foot lot sizes with an assumed minimum lot size of 5,000 square feet for single-family detached housing (1, 1.5, and 2 times the minimum lot size for single-family detached, respectively). The purpose of this analysis was to see how the requirement for larger lots than required for single-family detached impact feasibility. (See discussion on page 4 for more on how we addressed land costs in this analysis.)

Key Findings: Impacts of Increased Land Cost

For lot sizes more than 1 times the single-family detached lot size but less than 2 times that lot size, the land cost increase is probably non-linear. The main issue in an infill situation would be a reduced supply of lots (see discussion on page 12). If it is not possible to build 2 houses on a lot, triplex or fourplex development is still competing against the returns of 1 single-family home. This is less clear in a greenfield situation where the increase in land cost might be more linear. As noted on page 4, if the lot size for a triplex or fourplex is 2, 3, or 4 times the lot size for a single-family home, the land cost will increase by a roughly corresponding amount.

Our analysis shows that **increased land cost** (50% to 100% above the cost of 1 single-family lot for a lot larger than the minimum for single family) **has a pronounced negative impact on feasibility, particularly in hot and warm markets where land costs are higher**. (See Exhibit 3 and Exhibit 4 on page 11.) A higher FAR helps mitigate this to some degree but it is generally not enough to overcome the increase in land costs. While we did not test lot sizes 3 to 4 times the minimum for single-family detached homes, we anticipate that those would show an even more pronounced impact on feasibility because of the corresponding increase in land costs.

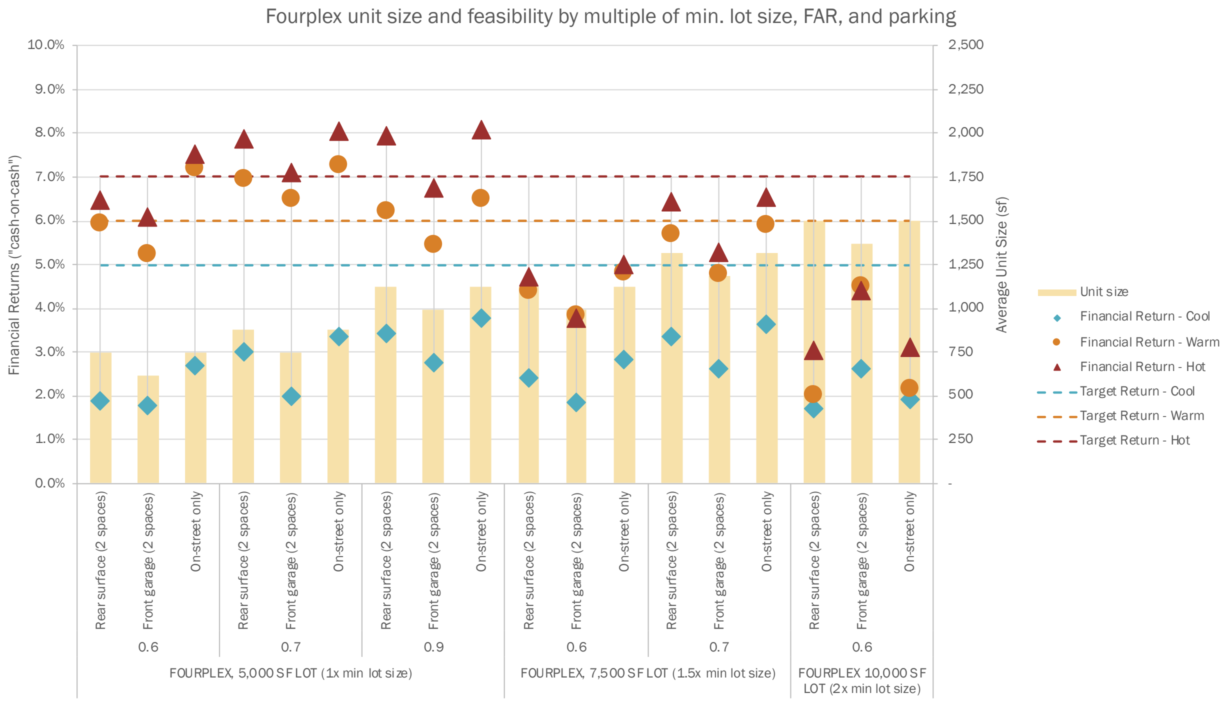
Feasibility Results by Regulatory Scenario

Exhibits 3 and 4 on the following page show the following for each regulatory scenario, like Exhibits 1 and 2:

- Maximum average unit size possible (pale yellow bars).
- Estimated financial returns for each set of market conditions (blue diamonds for cool markets, orange circles for warm markets, and red triangles for hot markets).
- Target financial returns for each set of market conditions (blue dashed line for cool markets, orange dashed line for warm markets, and red dashed line for hot markets).

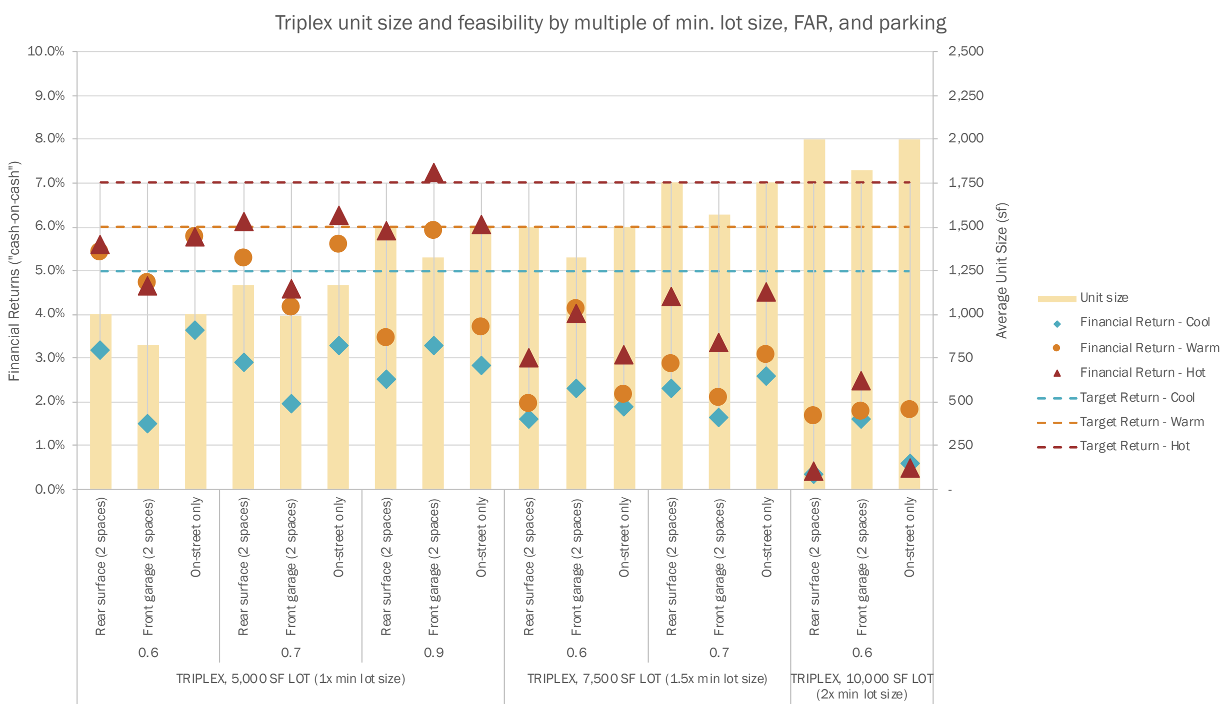
Where the estimated returns exceed the target returns for that market (shown as the marker being above the dashed line of same color), this indicates a greater likelihood of financial feasibility for that development. As noted previously, **this analysis is intended to provide a rough indication of feasibility challenges, not to provide a precise calculation of the feasibility of a specific situation**, given that the financial inputs are illustrative rather than precisely calibrated for any given location.

Exhibit 3: Fourplex Results Summary by Multiple of Minimum Lot Size



Source: ECONorthwest

Exhibit 4: Triplex Results Summary by Multiple of Minimum Lot Size



Source: ECONorthwest

Key Findings: Reduced Land Availability

To estimate how much minimum lot sizes greater than those for single-family homes might affect the availability of lots for development in an infill situation, we used readily available data from two example areas zoned for single-family homes to measure the prevalence of lots at various multiples of the minimum size for single-family homes in that zone. The two sample areas we tested illustrate opposite ends of a spectrum:

- The Eugene R-1 zone allows 14 dwelling units per net acre, which translates to a minimum of just over 3,000 square feet per single family home (though it is not described as a minimum lot size). The sample area was platted under different zoning rules; many lots are larger than the minimum allowed by the current R-1 zoning.
- The Redmond R-1 zone has a minimum lot size of 9,000 square feet, and there are relatively few larger lots in the sample area.

As shown in Exhibit 5, more than 90% of the lots in the Eugene sample area are more than twice the minimum area required for a single-family home, but less than a quarter are more than 4 times the minimum required for a single-family home. In Redmond, less than half of the lots in the sample area were even 1.25 times the minimum lot size for single-family homes, and only 2% were 4 times the minimum lot size.

Exhibit 5: Prevalence of Lots by Multiple of Minimum Lot Size

Multiple of Min. Lot Size for Single-Family Homes	Eugene R-1	Sample Area		Redmond R-1	Sample Area	
	Lot Size (sf)	# of Lots	% of Lots in Sample	Lot Size (sf)	# of Lots	% of Lots in Sample
1	3,111	972	100%	9,000	858	100%
1.25	3,889	970	100%	11,250	349	41%
1.5	4,667	956	98%	13,500	176	21%
2	6,223	902	93%	18,000	69	8%
3	9,334	504	52%	27,000	25	3%
4	12,446	212	22%	36,000	17	2%

Source: ECONorthwest analysis based on parcel and zoning data provided by the cities of Eugene and Redmond for prior (recent) projects.

This shows that **requiring lot sizes up to 2 times the minimum for single-family homes may not be a major issue from a land supply perspective in all communities, but it will be an issue in some communities**. **Requiring lot sizes that are 3 to 4 times the minimum for single-family detached homes will be a land supply issue for infill development in many communities**.

Conclusions

In summary, if the goal is to maximize or ensure feasibility for triplex and fourplex development to the extent possible, we recommend the following options:

- Scale FAR to minimum lot size, so that smaller lots are allowed higher FAR. This will ensure a reasonable average unit size even on small lots.
- Set the minimum lot size for triplexes and fourplexes the same as for single-family detached homes in the zone. Requiring larger lots increases costs, decreases feasibility, and reduces the supply of lots where triplex and fourplex development is allowed.
- Do not require more than 1 parking space per development in zones with a minimum lot size under 5,000 sq. ft., as fitting the parking on site reduces the buildable area for housing and may not allow a reasonable average unit size.

Any changes to regulations that decrease efficiency of land relative to the scenarios evaluated in this analysis would have detrimental impacts to project viability for triplexes and fourplexes.

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DATE: July 24, 2020
TO: Matt Hastie and Kate Rogers, Angelo Planning Group
CC: Ethan Stuckmayer, Department of Land Conservation and Development
FROM: Becky Hewitt and Tyler Bump, ECONorthwest
SUBJECT: Triplex/Fourplex Financial Feasibility Sensitivity Testing for Middle Housing Model Code: Floor Area Ratio Update

Introduction

This memorandum provides an update to ECONorthwest's previous analysis of triplex and fourplex feasibility. (Please see the prior memo, dated June 15, 2020, for our assumptions and methodology.) This memorandum is focused on testing the impact of increased Floor Area Ratio (FAR) standards as described in the memorandum from JET Planning and others. We have tested additional prototypes that reflect the higher maximum FAR standards listed in that memorandum in comparison to those currently listed in the draft model code (see Exhibit 1, below). In some cases, where a lot size falls at the transition point between two proposed standards, we have tested both standards.

Exhibit 1: Floor Area Ratios Tested by Lot Size

Lot Size (square feet)	Floor Area Ratios tested[1]
3,000 sf	0.9, 1.1, 1.4
5,000 sf	0.7, 0.9, 1.1
7,500 sf	0.6, 0.9
10,000 sf	0.4, 0.5

Feasibility Results

Physical Limitations

Note that SERA Architects has not done specific analysis of potential site layouts to determine whether the floor areas tested can realistically be accommodated given the other site limitations (parking, setbacks, etc.). However, SERA's prior analysis showed that on a 3,000 sf (30-foot by 100-foot) lot, the assumed setbacks (20-foot front setback, 15-foot rear setback, and five-foot side setbacks[2]) allow for only a 1,300 sf building footprint even without on-site parking. Even with three full stories, this would limit the floor area ratio to 1.3. Achieving a FAR of 1.4 on a 3,000 sf lot or smaller would require smaller setbacks than 15- and 20-feet. It also would require that parking (if any) be accommodated in setbacks and/or within the floor area of the unit (i.e. a garage with a driveway only as long as the setback). SERA's prior analysis of 5,000 sf and larger lots showed that setbacks and parking are less likely to constrain the total FAR, especially if buildings can be three stories tall.

[1] Floor area ratio, per the current draft model code definition, includes garages and enclosed parking areas.

[2] The current draft of the model code establishes these as a maximum that jurisdictions can impose.

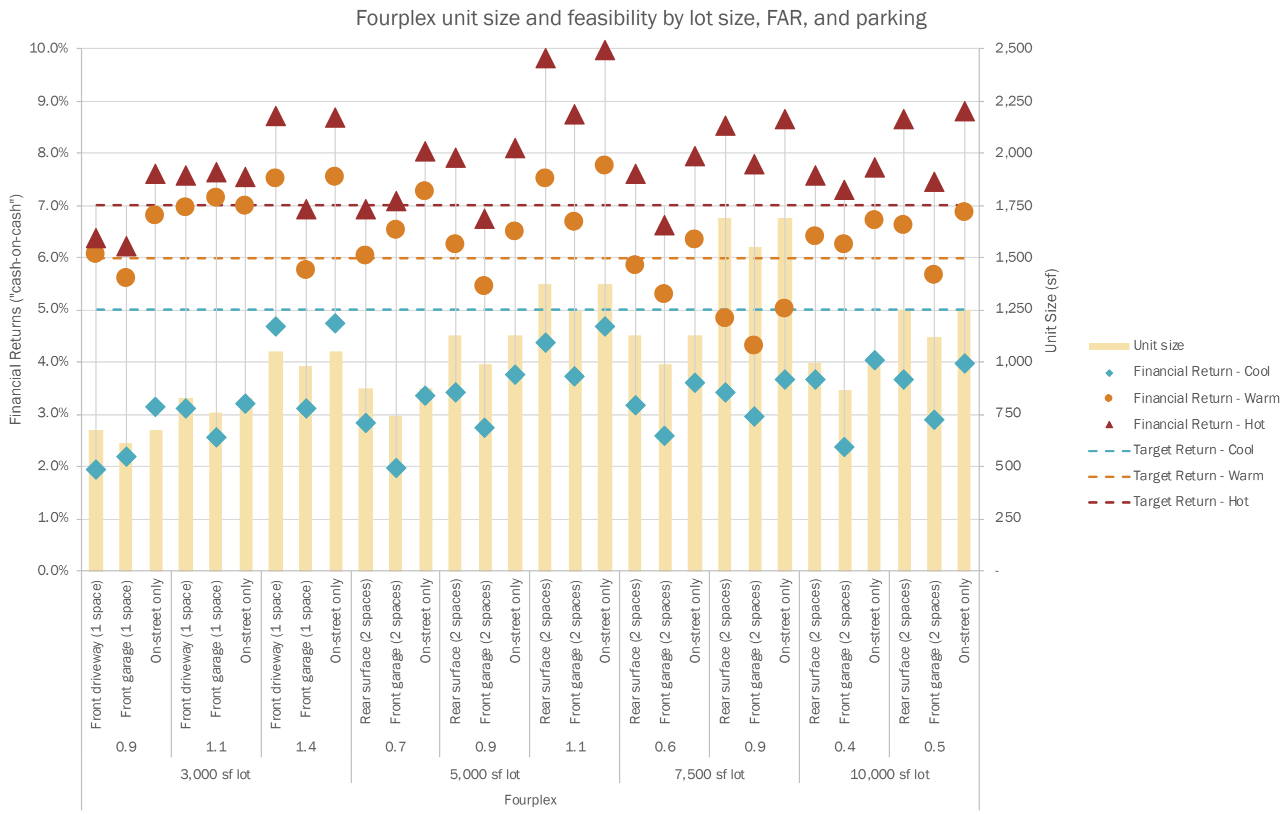
Financial Implications

Exhibits 1 and 2 on the following page show the following for each regulatory scenario (i.e., each combination of lot size, FAR, number of units, and parking that we tested):

- Average unit size (pale yellow bars).
- Estimated financial returns for each set of market conditions (blue diamonds for cool markets, orange circles for warm markets, and red triangles for hot markets).
- Target financial returns for each set of market conditions (blue dashed line for cool markets, orange dashed line for warm markets, and red dashed line for hot markets).

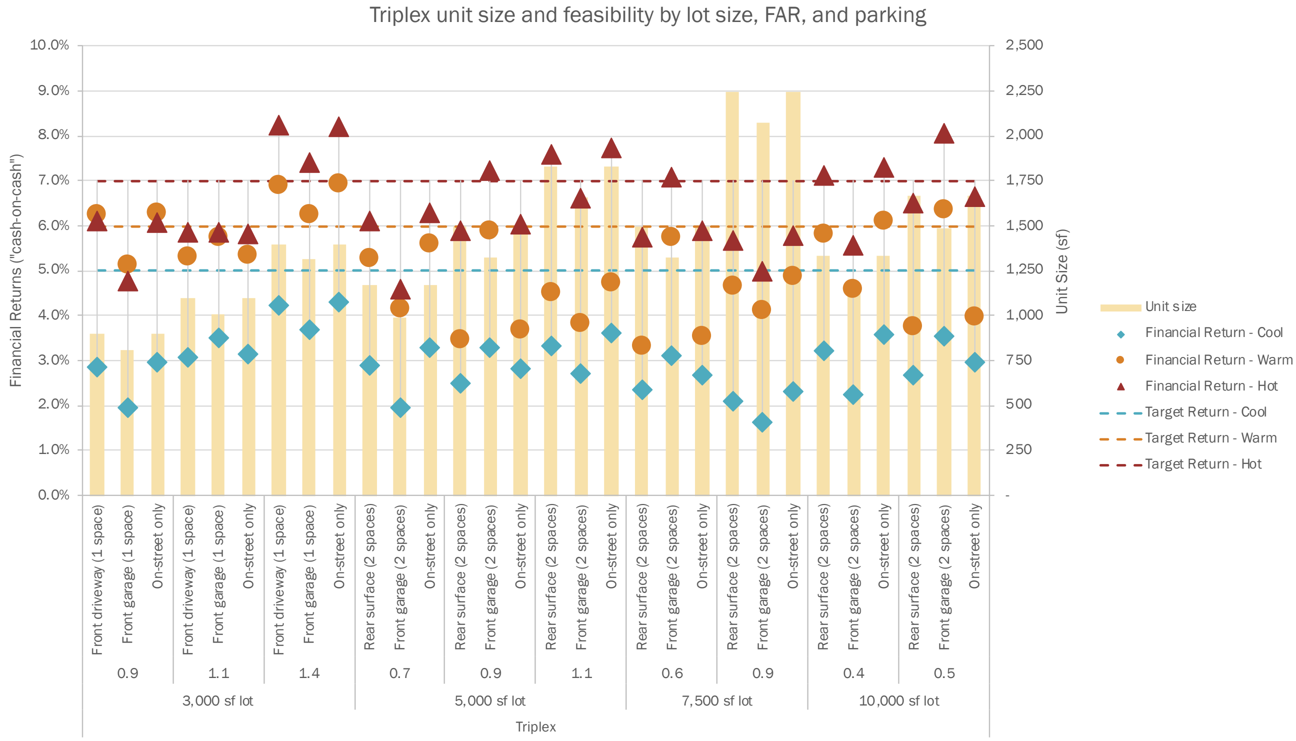
Where the estimated returns exceed the target returns for that market (shown as the marker above the dashed line of same color), this indicates a greater likelihood of financial feasibility for that development. **This analysis is intended to provide a rough indication of feasibility challenges, not to provide a precise calculation of the feasibility of a specific situation**.

Exhibit 2: Fourplex Results Summary by Lot Size, FAR, and Parking



Source: ECONorthwest

Exhibit 3: Triplex Results Summary by Lot Size, FAR, and Parking



Source: ECONorthwest

Conclusions

Achieving higher floor area ratios on smaller lots is likely to require minimal setbacks, though this may already be the case for residential zones that allow small-lot detached development. Financially, our analysis shows that allowing larger unit sizes (in the 1,200 to 1,800 sf range) may improve feasibility, though average unit sizes larger than about 2,000 sf do not appear to improve feasibility under the conditions tested and are uncommon for attached housing of any kind. The higher FARs appear to offer the greatest benefits for the 3,000 and 5,000 sf lot examples, with less or no benefit for the 7,500 and 10,000 sf lot examples.

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DATE: July 24, 2020
TO: Matt Hastie and Kate Rogers, Angelo Planning Group
CC: Ethan Stuckmayer, Department of Land Conservation and Development
FROM: Becky Hewitt and Tyler Bump, ECONorthwest
SUBJECT: Townhouse Feasibility Considerations for Middle Housing Model Code

Introduction

As part of the consultant team led by Angelo Planning Group (APG), ECONorthwest is advising on development feasibility for the Middle Housing Model Code project. This memo provides an evaluation of reasonable bounds for key development standards for townhouses. This evaluation is based on a detailed review of example townhouse developments statewide, rather than on analysis of hypothetical developments. This is because there are sufficient recent built examples for townhouse development to provide insights into the development scale and density that is workable in practice. The example developments were sourced from a combination of input from Model Code Technical Advisory Committee members and research by ECONorthwest, SERA Architects, and Angelo Planning Group.

Observations and Recommendations by Topic

Unit Size

Observations:

- The smallest observed unit size is about 900 square feet (sf), with roughly a 450 sf footprint. Nearly all units were at least 1,000 sf, and most were at least 1,200 sf.
- The most common sizes are between 1,200-1,800 sf with 2 floors of living space.
- Very few townhome developments with four or more units per building have units larger than 2,000 sf.
- There are more larger units in developments with just two attached units. (These also tend to be quite a bit more expensive, and have mostly been built in high-cost neighborhoods in Portland and prime locations in areas with a strong second home market.)
- In some cases, larger units were on larger lots, but this was not always the case.
- Below-grade living space is uncommon within the examples we reviewed, though at least one townhouse development had one floor of living space partially below grade, and several had tuck-under garages that were slightly below grade.

Recommendations:

- For minimum feasibility, ensure that regulations allow for at least a 1,200 sf unit size for townhouses.

- To provide greater flexibility, allow for unit sizes up to 2,000 sf.
- Do not link allowed floor area to lot size (e.g. through floor area ratio standards).

Parking

Observations:

- Most townhouses have a garage with a driveway. Single-car garages are more common than two-car garages overall among the examples we reviewed, though outside of Portland, there is a more even split.
- A few townhouses have no parking at all (all located in Portland among the examples we reviewed).
- Townhouse developments built as part of a greenfield development have a mix of alley and street access. Infill development mostly has street access or a shared driveway (or no parking).

Recommendations:

- For minimum feasibility, do not require more than one parking space per unit.
- For greater flexibility, allow parking within the front setback (in a driveway) and on-street parking abutting the development to count towards the parking requirement.
- For maximum flexibility, do not require parking, and do not restrict development from providing two garage spaces if desired.

Lot size and Density

Observations:

- The smallest observed lot size (highest observed density) is 6 units on a 5,000 sf lot (833 sf per unit) in Portland with no parking and no yard or shared open space. There were other examples in the Portland suburbs (including in both Gresham and Washington County's North Bethany area) with lots under 900 sf and no yard but with garage parking and a shared driveway.
- The largest observed lot size is between 2,600 and 4,000 sf within a single development, but this includes a private road. The usable lot area for the development is closer to 2,000 to 3,700 sf. Buildings each had two attached townhouse units, which increases lot size relative to buildings with more units attached due to side yards, and some have deeper lots with larger yards due to site configuration.
- Most townhouses have between 1,200 and 3,000 sf per unit.

Recommendations:

- For minimum feasibility, do not require more than 3,000 sf of land per unit (on average for the development) in any zone. This might be appropriate in zones with larger minimum lot sizes for single family homes (e.g. 12,000 sf, allowing 4 townhouse units).
- To encompass the most likely townhouse development, allow townhouses on lots as small as 1,200 sf (on average for the development). This would translate to roughly 4 units on a 5,000 sf lot.
- For maximum flexibility, allow lots as small as 800 sf (on average for the development) in zones with lower minimum lot sizes for single family homes (e.g. under 3,000 sf).

Height

Observations:

- Development examples were roughly split between two-story and three-story townhouses. A few had three and a half stories, or had a lofted top floor ceiling that made them appear to be four stories.
- Nearly all townhouses that have a garage for parking are at least two and a half stories tall (sometimes the garage was partly below grade).

Recommendations:

- For minimum feasibility, allow at least two and a half stories in all zones.
- For greater flexibility, allow three full stories (or more, if allowed for single family homes).