Neighborhood Residential Tree Planting Regulations Analysis
December 2024

This document summarizes analysis that was done to understand potential outcomes under proposed Neighborhood Residential Tree Planting Regulations. The first set of models (page 2 & 3) look at different ways of achieving the requirement on three prototype developments at 25 years of growth. The second set of models (page 4 & 5) look at the same prototypes at mature canopy. The last model (page 6) looks at how planting might play out on a full block that is partially redeveloped. The full block model looks at a scenario in which 4 out of 24 lots (17%) redevelop. The Middle Housing Feasibility analysis developed by EcoNW estimates that 8-10% of lots in Neighborhood Residential zones might redevelop over 20 years under the proposal released in October 2024. A summary of assumptions used in this analysis is provided below.

Assumptions

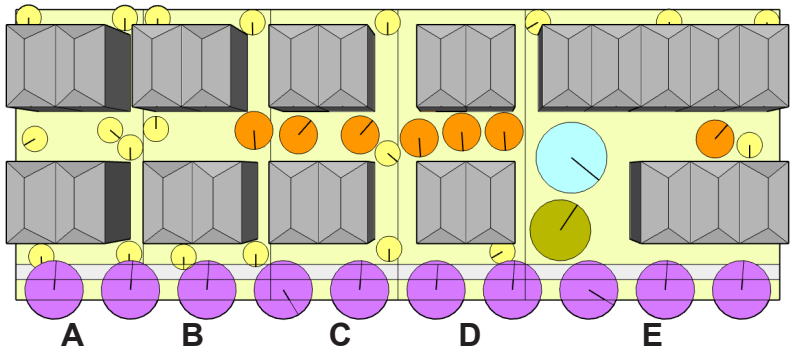
- Tree Size: Tree canopy sizes were developed by SDCI and SDOT arborists in 2016 to support analysis done to create the tree planting requirements for RSL zones.
    - Mature canopy sizes are based on city street tree list
    - Tree canopy at 25 years was assumed to be about half the area of mature canopy
- Number of Street trees: The number of street trees provided on redeveloped lots was based on a review of 11 recent plan sets in RSL zones which found that street trees occurred on average:
    - Every 25 feet for properties without driveways
    - Every 33 feet for properties with driveways
- Building placement: Building prototypes were developed by MAKERS as part of the Updating Seattle's Neighborhood Residential Zones report
- Tree placement: Trees were placed based on professional judgment. Generally, trees were not placed where they would overlap buildings at 25 years or where soil space would be significantly less than canopy volume.
- Canopy measurement
    - Tree canopy on adjacent lots from trees that overhang lot line still counts
    - Overlapping tree canopies should not be double counted
    - Canopy cover overlapping buildings doesn't count if species is small since they tend to be 30 feet or less, but does count for larger species trees

DRAFT Neighborhood Residential (NR) Proposed Tree Requirement
25-Year Canopy Growth

Shown: 1 Point required per 750 sq. ft. lot area for densities at least 1 unit / 1,600 sq. ft. of lot area

1 point	2 points	3 points	4 points	1 point per inch of trunk diameter 6" or more	N/A	
						
Small 8-15' canopy spread* 10' shown	**Small-Med.** 16-20' canopy spread* 16' shown	**Med.-Large** 21-25' canopy spread* 24' shown	**Large** 26-30' canopy spread* 28' shown	**Preserved** Assumes 10" diameter trunk 30' shown	**Street Tree** Assumes Medium-Large* 23' shown	* Assumed canopy spread at 25 years

2 Duplexes No Parking (Prototype 4)



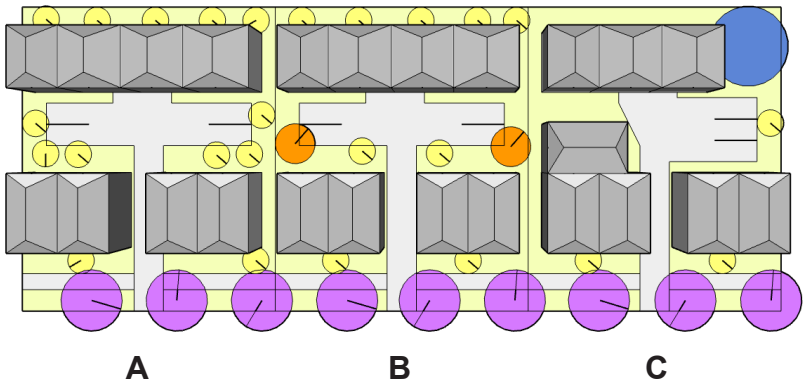
Calculations

- 5,000 sq. ft. lots (A - D): 7 pts. required
- 10,000 sq. ft. lot (E): 13 pts. required
- Canopy coverage half block: 23.1%

Findings & Observations

- Limited space for trees larger than small-medium on a single lot without modifying the prototype.
- A requirement higher than 1 pt. / 750 sq. ft. would be possible but would result in little useable open space on site.
- Combined lot (E) with siting adjustments allows for Medium-Large and Large trees.
- Absence of parking and curbcuts allow for requrement to be met comfortably.

Duplexes / Fourplexes, Garage and Surface Parking (Prototype 2C with combined lots)



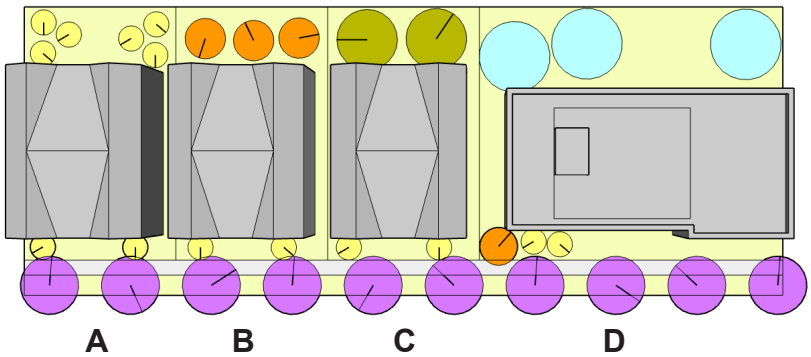
Calculations

- 10,000 sq. ft. lots: 13 pts. required
- Canopy coverage half block: 19.5%

Findings & Observations

- Limited space for trees larger than small-medium without modifying the prototype.
- A requirement higher than 1 pt. / 750 sq. ft. would be difficult to achieve under the prototype.
- Little useable open space on site.
- Siting modification (C) allows for preservation of an existing tree or large tree.
- Curbcuts reduce the number of street trees, decreasing the overall canopy coverage.

Stacked Flats No Parking (Prototype 6)



Calculations

- 6,000 sq. ft. lot (A-C): 8 pts. required
- 12,000 sq. ft. lot (D): 16 pts. required
- Canopy coverage half block: 25.3%

Findings & Observations

- Trees up to medium-large can be located without modifying the prototype
- A requirement higher than 1 pt. / 750 sq. ft. would be possible but would result in little useable open space on site.
- Siting modification (D) allows for preservation of existing trees or multiple large trees.
- Absence of parking and curbcuts allow for requrement to be met comfortably.

DRAFT Neighborhood Residential (NR) Proposed Tree Requirement
25-Year Canopy Growth

Tree Size	Small	Small-Medium	Medium-Large	Large	Preserved	Total Points
Points	1	2	3	4	9	

2 Duplexes No Parking (Prototpye 4)						
Model Lot						
A	7					7
B	5	1				7
C	3	2				7
D	1	3				7
E	4	1	1	1		13
Half Block Total Area	34,200	sq. ft				
Street Trees	10					
Half Block Canopy Area	7,906					
Canopy Coverage	**23.1%**					

Duplexes / Fourplexes, Garage and Surface Parking (Prototype 2C with combined lots)						
Model Lot						
A	13					13
B	9	2				13
C	3				1	13
Half Block Total Area	34,200	sq. ft.				
Street Trees	6					
Half Block Canopy Area	6,668					
Canopy Coverage	**19.5%**					

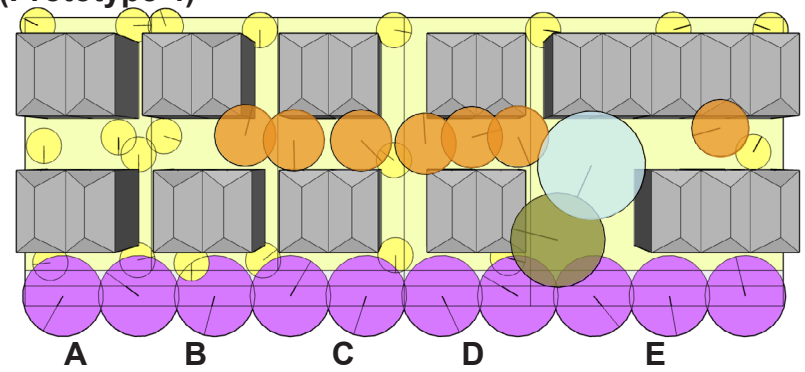
Stacked Flats No Parking (Prototpye 6)						
Model Lot						
A	8					8
B	2	3				8
C	2		2			8
D	2	1		3		16
Half Block Total Area	34,200	sq. ft				
Street Trees	10					
Half Block Canopy Area	8,669					
Canopy Coverage	**25.3%**					

DRAFT Neighborhood Residential (NR) Proposed Tree Requirement
Canopy At Maturity

Shown: 1 Point required per 750 sq. ft. lot area for densities at least 1 unit / 1,600 sq. ft. of lot area

1 point	2 points	3 points	4 points	1 point per inch of trunk diameter 6" or more	N/A	
						
Small 8-15' canopy spread* 10' shown	**Small-Med.** 16-20' canopy spread* 16' shown	**Med.-Large** 21-25' canopy spread* 24' shown	**Large** 26-30' canopy spread* 28' shown	**Preserved** Assumes 10" diameter trunk 30' shown	**Street Tree** Assumes Medi-um-Large* 23' shown	* Assumed can-opy spread at 25 years

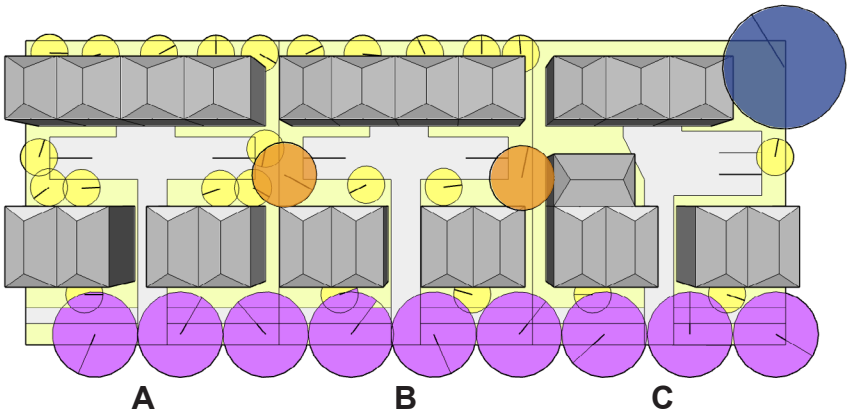
2 Duplexes No Parking (Prototype 4)



Calculations
- 5,000 sq. ft. lots (A - D): 7 pts. required
- 10,000 sq. ft. lot (E): 13 pts. required
- Canopy coverage half block: 43.1%

Findings & Observations
- At maturity tree canopy for small-medium sized trees and greater begins to overlap buildings.
- At maturity, tree canopy becomes layered.
- At maturity, tree planting requirement results in canopy exceeding the city's coverage goal.

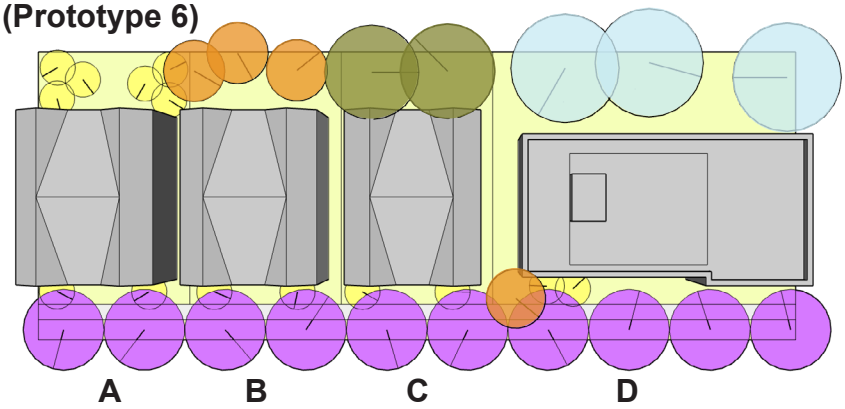
Duplexes / Fourplexes, Garage and Surface Parking (Prototype 2C with combined lots)



Calculations
- 10,000 sq. ft. lots: 13 pts. required
- Canopy coverage half block: 36%

Findings & Observations
- At maturity tree canopy for small-medium sized trees and greater begins to overlap buildings.
- At maturity, tree canopy becomes layered.
- At maturity, tree planting requirement results in canopy exceeding the city's coverage goal.

Stacked Flats No Parking (Prototype 6)



Calculations
- 6,000 sq. ft. lot (A-C): 8 pts. required
- 12,000 sq. ft. lot (D): 16 pts. required
- Canopy coverage half block: 46.4%

Findings & Observations
- At maturity, tree canopy for small-medium sized trees and greater begins to overlap buildings.
- At maturity, tree canopy becomes layered.
- At maturity, tree planting requirement results in canopy exceeding the city's coverage goal.

DRAFT Neighborhood Residential (NR) Proposed Tree Requirement
Canopy At Maturity

Tree Size	Small	Small-Medium	Medium-Large	Large	Preserved	Total Points
Points	1	2	3	4	9	

2 Duplexes No Parking (Prototpye 4)						
Model Lot						
A	7					7
B	5	1				7
C	3	2				7
D	1	3				7
E	4	1	1	1		13
Half Block Total Area	34,200	sq. ft				
Street Trees	10					
Half Block Canopy Area	14,730					
Canopy Coverage	**43.1%**					

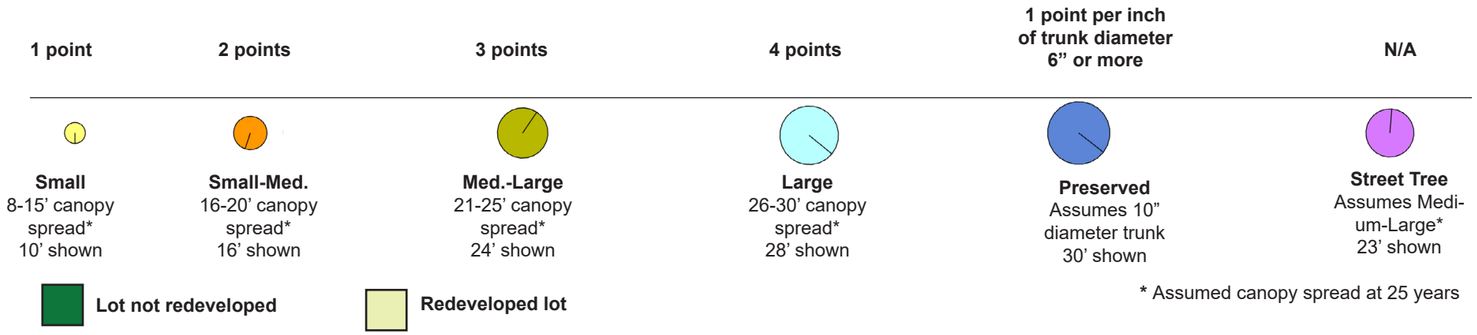
Duplexes / Fourplexes, Garage and Surface Parking (Prototype 2C with combined lots)						
Model Lot						
A	13					13
B	9	2				13
C	3				1	13
Half Block Total Area	34,200	sq. ft.				
Street Trees	6					
Half Block Canopy Area	12,327					
Canopy Coverage	**36.0%**					

Stacked Flats No Parking (Prototpye 6)						
Model Lot						
A	8					8
B	2	3				8
C	2		2			8
D	2	1		3		16
Half Block Total Area	34,200	sq. ft				
Street Trees	10					
Half Block Canopy Area	15,866					
Canopy Coverage	**46.4%**					

DRAFT Neighborhood Residential (NR) Proposed Tree Requirement

Shown:

- **1 Point required per 750 sq. ft. lot area for housing densities of 1 unit : 1,601 sq. ft. or greater**
- **1 Point required per 500 sq. ft. lot area for housing densities of 1 unit: 1,600 sq. ft. or less**
- **Tree planting requirement is higher for low density development**



Calculations & Assumptions

- 5,000 sq. ft. lots: 7 pts. required for high density; 10 pts. for low density
- 6,000 sq. ft. lots: 8 pts. required for high density; 12 pts. for low density
- Lots that are not redeveloped have existing canopy coverage of 12% - 46% consistent with existing conditions on blocks observed in aerial photos of North Seattle in 2024.
- 20 of 24 lots (84%) are not redeveloped.
- 4 of 24 lots (16%) are developed for the purposes of modeling a block on the high end of expected 20-year redevelopment scenarios. Analysis by EcoNW estimated that 8%-10% of NR lots might redevelop citywide over 20 years.
- Street trees are located at roughly 30' intervals on redeveloped lots.

Findings & Observations

- **Overall canopy coverage of 31% is achieved on the block as a whole including street trees.**
- Canopy coverage on lots not redeveloped* is 34%.
- Canopy coverage on redeveloped lots* is 21%.
- A heavily-treed existing condition with mature trees in the block would be necessary to achieve the 30% canopy coverage goal in the full block area.
- Of the total canopy coverage in the block, 89% is on lots not redeveloped, 11% is on redeveloped lots, and 26% is on the right of way.

** Includes right of way adjacent to the lot up to the curb line.*

*** Includes the sidewalks and planting strip. Does not include the street surface.*