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MEMO

DATE: January 2, 2020

TO: Residential Infill Project File

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SUBJECT: Residential Infill Project capacity and growth allocation modeling methodology

To ascertain and analyze potential impacts from proposed changes to the City's single dwelling residential zones (specifically new allowances for duplexes, triplexes and fourplexes in R7, R5, and R2.5 zones), the Comprehensive Plan land capacity and growth allocation model (BLI model) was revised and rerun. The model provides a two part output: 1. An assessment of the capacity of land within the City of Portland to accommodate forecasted housing and employment needs through the Year 2035, and 2. A geographic allocation of the projected households. The BLI model methodology was adopted by the Portland City Council and acknowledged by both state (LCDC) and regional (Metro) planning agencies (Ord. 187831, Vol. 1.1.J, page 132). Below is a brief description of the model methodology and additional detailed information about the original BLI model can be found here:

<https://www.portlandoregon.gov/bps/article/627460>

Overview of BLI model methodology

The adopted BLI used a GIS capacity and allocation model to determine whether suitable residential and employment land will be available over the next 20 years. The Development Capacity Analysis and Growth Allocation geographic information systems (GIS) model consists of 4 basic steps:

1. Calculate existing and recommended development and allowed development limits in terms of building square footage, number of multi-family residential units, number of single-family residential lots, and estimated number of jobs;



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2. Identify development parcels that significantly underutilize their allowed (or proposed) development capacity. In the single dwelling zones (RF-R2.5), parcels that can be subdivided into 3 or more parcels are mapped as underutilized.
3. Apply development constraints such as infrastructure, regulatory requirements, and natural hazards to determine remaining, estimated development capacity in terms of building square footage, number of multi-family residential units, number of single-family residential lots, and estimated number of jobs;
4. Allocate the expected 20-year housing and employment growth to the available development capacity.

Housing units are allocated based on population and housing forecasts provided by Metro as follows:

Allocation Type	Allocation	Notes
Multi-family units (MFR)	81,653	96,059 (2010 to 2035 forecast) less 2,043 ADUs, less 12,363 new MFR units (2010 through 6/1/15)
Single-family units (SFR)	22,098	25,535 (2010 to 2035 forecast) less 3,437 new SFR units (2010 through 6/1/15)
ADU units	2,045	3,000 (2010 to 2035 forecast) less 955 ADUs through 6/1/15. ADU units assigned to SFR zones through separate model

The model allocated units as housing types. The housing types range from Type A (detached house) to Type K (high-rise towers) and are assigned to zones based on zoning allowances and recent development trends. Types A-D are SFR housing types and types E-K are MFR housing types. For the R2.5 – R7 zones, the following housing type assumptions were made for the Comp Plan:

Zone	A Detached house	B Small lot house	C Attached medium density	D Attached high density	E Plexes	F Corridor apts	G SRO housing	H Neigh mixed use	I Mid rise small	J Mid rise large	K High rise
R7	100%	-	-	-	-	-	-	-	-	-	-
R5	85%	15%	-	-	-	-	-	-	-	-	-
R2.5	70%	25%	5%	-	-	-	-	-	-	-	-

Changes to the model based on the Residential Infill Project proposals

To evaluate the zoning entitlement changes proposed by the Residential Infill Project and changes introduced by the Planning and Sustainability Commission, several changes were required in the model.

Determining available capacity (R2.5 – R7 lots)

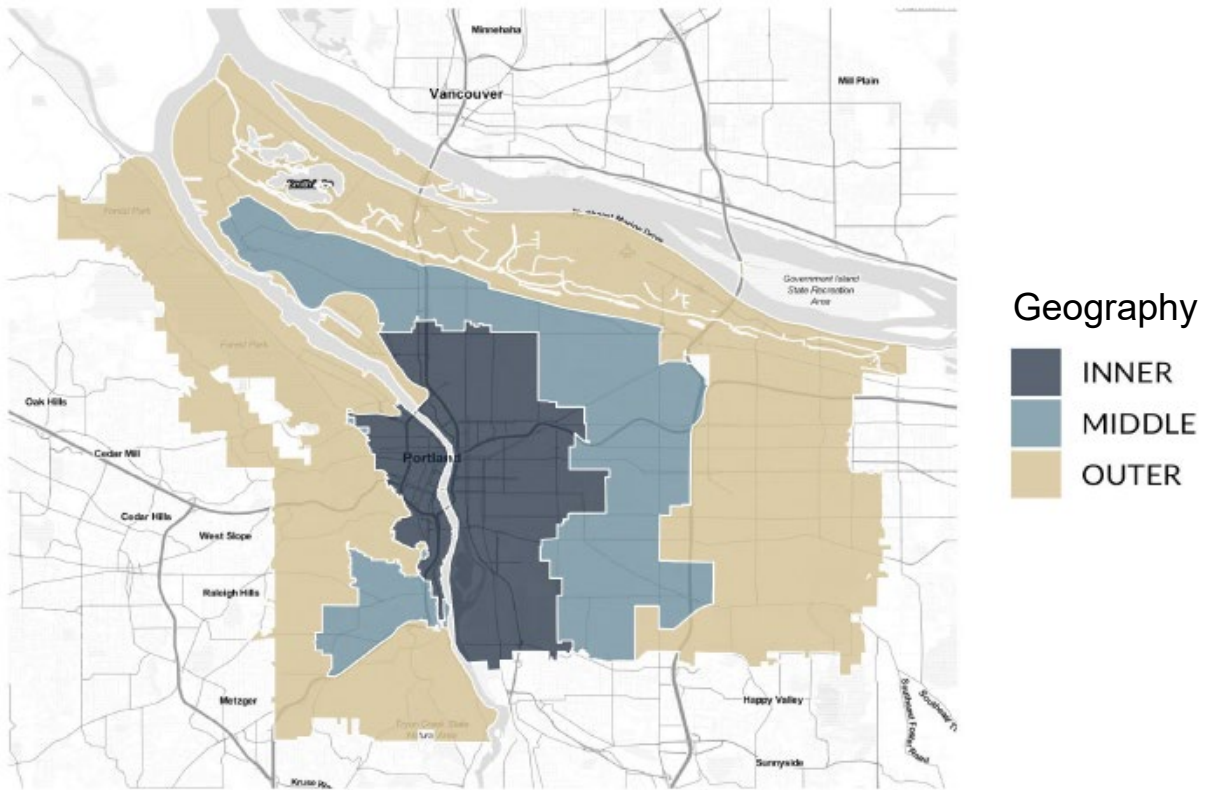
1. Treat land proposed to be rezoned from R5 to R2.5 as R2.5 throughout model
2. Identify vacant and underutilized parcels by strike price model rather than underutilized parcels that are sub-dividable:



- Strike price varies by 3 geographies (inner, middle, outer)
 - Inner = Inner Ring Geography
 - Middle = Inner neighborhood pattern area geography minus inner ring. This includes some inner parts of SW like Hillsdale, Multnomah and some areas very close to Barbur.
 - Outer = Eastern pattern area and outer parts of western pattern area.

Geography	R7	R5	R2.5
Inner	\$45.2/sq.ft.	\$55.9/sq.ft.	\$69.2/sq.ft.
Middle	\$39.3/sq.ft.	\$48.6/sq.ft.	\$60.2/sq.ft.
Outer	\$26.0/sq.ft.	\$32.1/sq.ft.	\$39.8/sq.ft.

- Where Real Market Value =< strike price, the lot is considered “underutilized”



3. Exclude parcels that are “constrained”:
 - Exclude parcels in the ‘z’ overlay.
NOTE: the revised model uses early drafts of the ‘z’ overlay (included stormwater constraints, different landslide data. Subsequent refinement of ‘z’ has not significantly changed geography, and only slightly added eligible parcels all in similar TAZ geographies.)
 - Exclude parcels that are too small for 3 or 4 units.



	R7	R5	R2.5(.9)
Min lot size	5,000 sq. ft.	4,200 sq.ft.	3,200 sq.ft.

4. For unpaved streets, decrease “buildable” factor from .85 to .55.
(Rate_Housing number for the conTranSub constraint in the CONSTRAINTS tab)
5. Leave other zoned capacity numbers unchanged from 2035 Comp Plan model run
 - Changes from Central City and MDP projects are not factored in but also do not relate to single dwelling zone or triplex/fourplex development.
 - Any development since 2015 is also not reflected in the model to allow direct comparison against comp plan results.
6. In the zone capacity table
in the RF-R2.5 zones, MFR housing type E (plexes) was changed from 0% to 100%.
SFR housing types A-D assumptions remain unchanged.

Zone	A Detached house	B Small lot house	C Attached medium density	D Attached high density	E Plexes	F Corridor apts	G SRO housing	H Neigh mixed use	I Mid rise small	J Mid rise large	K High rise
R7	100%	-	-	-	100%	-	-	-	-	-	-
R5	85%	15%	-	-	100%	-	-	-	-	-	-
R2.5	70%	25%	5%	-	100%	-	-	-	-	-	-

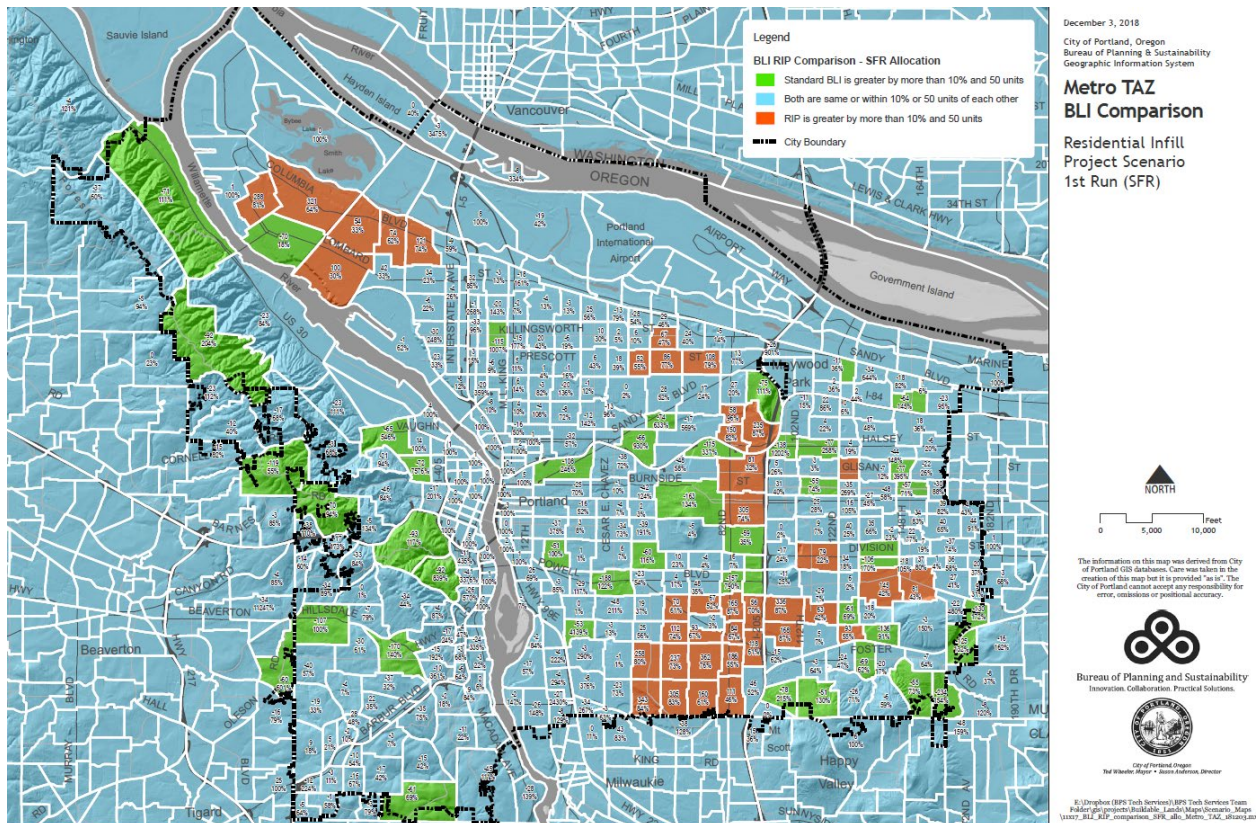


Residential Unit reallocation (Citywide)

The BLI model was originally designed to allocate residential units based on a bright line distinction between SFR units (Housing Type A through D) versus MFR units (Housing Type E through K). With the revised Residential Infill proposal, small -plex housing types (Type E) have been introduced into the single dwelling zones. This complicates the allocation model by blending single units and multi units across zones.

The first model run (map 1, below)

1. Rerun model with updated capacity in single dwelling zones.
2. Unit allocation is 22,098 Type A-E housing units

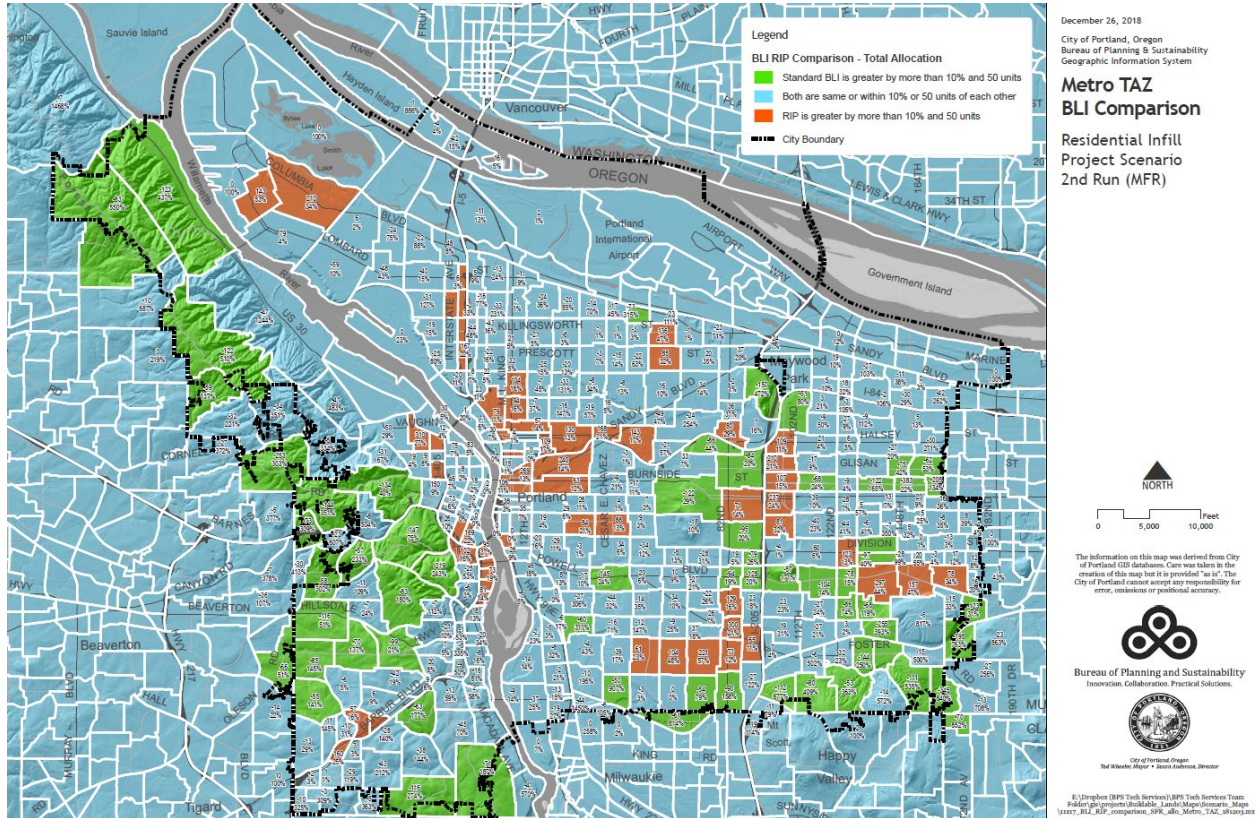


The issue with this run of the model is that it ignores the potential for triplex/fourplex production in the single dwelling zones to “siphon” units away from multi dwelling zones. Instead, it only reallocated units from within the single dwelling zones to other single dwelling zoned areas where there was still demand but previously lacked capacity.



The second model run (map 2, below)

1. Manually add SFR capacity to MFR capacity in all grid cells; add SFR to the MFR forecast in the assumptions (retain an arbitrary SFR marker so the model will run); run the allocation for both and disregard the arbitrary SFR marker results
2. Unit allocation is sum of all types (SFR, MFR, ADU = 105,796)



The issue with this run of the model is that it over-emphasizes demand in the multi dwelling and mixed use zones, based on the model's development trend preference to place MFR housing types in these areas.



The “averaged” map (map 3 below)

This map compares the TAZs within Map 1 and Map 2 and averages the results. This way, areas that may have over- or under-reported allocation using one method could be offset by the allocation from the other method. This gives a better blended sense of the unit allocation based on the middle housing types that straddle the model’s MFR and SFR house types.

