



MEMORANDUM

Cornelius Buildable Lands Inventory – Methodology and Initial Results (DRAFT)

City of Cornelius Housing Needs Analysis

DATE June 3, 2020
TO Ryan Wells and Tim Franz, City of Cornelius
FROM Matt Hastie, Clinton “CJ” Doxsee, and Courtney Simms, APG
CC

INTRODUCTION

The purpose of this memorandum is to summarize the methodology of a Geographic Information Systems (GIS)-based Buildable Land Inventory (BLI) for the City of Cornelius Housing Needs Analysis (HNA). The results will help determine whether the City has a sufficient supply of land to meet long-term (20 year) housing needs. The memo also will inform the strategies and approaches that may be effective and appropriate for increasing the developability of residential land, which can lead to greater overall housing supply.

The memorandum summarizes the methodology and key findings of the analysis, then presents the initial results in a series of tables and maps. This memorandum focuses solely on the supply and capacity of buildable residential land within the Metro Urban Growth Boundary (UGB). The methodology was informed by Metro’s BLI methodology from the 2018 Metro Buildable Lands Inventory, which was used to estimate available residential and employment land within the entire Portland Metropolitan Region (Metro) region.

The projected need for land to support future housing and the comparison of projected need and supply will be described in a separate Housing Needs Analysis report.

Regulatory Basis

Oregon Administrative Rules (OAR) provide guidance for the standards and methods to be used in preparing an inventory of buildable land. The methods and definitions used here are consistent with OAR 660-008 and OAR 660-024. Metro does not apply additional regulations or requirements but has developed its own methodology for identifying buildable lands within the Metro region. That methodology and resulting data has been used as a starting point for this analysis to ensure

consistency with regional procedures and to make efficient use of project resources. As noted in the following sections, the regional BLI data has been supplemented with local data, where available.

METHODOLOGY

The methodology generally follows the rules and assumptions identified in the methodology of Metro’s 2018 BLI. The steps used to generate the BLI include the following:

Step 1: Calculate deductions for environmental resources

Step 2: Identify residential land (land zoned for residential or mixed use)

Step 3: Identify vacant tax lots (and complement developed tax lots) by zoning class

Step 4: Remove tax lots from the BLI that don’t have the potential to provide residential or employment growth capacity (e.g., parks, schools or other public facilities, or land committed to future non-residential purposes)

Step 5: Calculate deductions for “future streets”

Step 6: Calculate BLI estimates (BLI includes capacity estimates for vacant land and properties with the potential for redevelopment)

The buildable lands inventory uses methods and definitions that are consistent with OAR 660-008 and OAR 660-024.

Step 1 – Calculate Deductions for Environmental Resources

Environmental resources typically provide beneficial environmental functions or aesthetic enhancements that are necessary to preserve. The preservation of these resources often provides a constraint on the developability of an area. To reflect this, areas that are identified as environmental resources are removed from the buildable inventory as a constraint.

Most areas that are considered environmental resources fall into multiple categories. Examples of these include areas that are in a floodway or floodplain, wetland, or include steep slopes. Often, this constrained land overlaps. Using an environmental hierarchy to classify the environmental features avoids double counting the capacity deduction for the BLI. Moreover, the City includes two environmental overlays, the Natural Resource Overlay (NRO) and Floodplain District (FP), which align closely with the Metro Titles 3 and 13 designations, as refined through the Tualatin Basin regional approach developed by Cornelius and other partnering organizations in the basin, and FEMA floodplain designations. Within the NRO district, density transfers are allowed where natural resources constrain development. BLI reductions will reflect the higher assumed protections when environmental features are overlapping.

Environmental Constraints categories used are the following:

- Floodways – FEMA’s latest flood hazard data and updated with the City of Cornelius’s Floodplain District.
- Flood Plain District (FP) – the City’s FP district regulates and restricts development in special flood hazard areas within the City.
- Slopes 25% or Steeper – Steep slopes were calculated using a digital elevation model to identify areas with slopes 25% or greater, which is consistent with OAR 660-008.
- Natural Resource Overlay (NRO) – The City’s NRO overlay regulates and restricts development in areas with natural resources as identified in the City’s natural resource inventory and map.
- Environmental Constraints – Title 3 and 13 data were provided by Metro RLIS. Significant Natural Resource Overlay (SNRO) data is provided by Metro RLIS and updated with the City of Cornelius’s Natural Resource overlay.
- Rights of Way – Utility ROW was provided by Metro RLIS, while transportation ROW was obtained using City GIS data.

These lands are combined and then overlaid with City tax lots to estimate the amount of land in each parcel where development is limited by these environmental constraints. These constrained areas are deducted from the gross area of the parcel to estimate the area of the parcel that is unconstrained and potentially buildable.

The land impacted by these constraints is removed from the inventory of developable land as follows.

Single-family residential

1. Floodways: 100% removed
2. Floodplain and Floodplain District: 100% removed
3. Slopes > 25% and Title 3 treated the same way: 100% removed
 - a. If tax lot \geq 50% constrained, follow the “maximum capacity rule” (defined below) to add back units¹
 - b. If tax lot is <50% constrained, assume 90% of unconstrained area is in BLI (i.e., apply 10% discount to vacant buildable acres)
4. Natural Resource Overlay (NRO):
 - a. 100% of Natural Resource Overlay that have been delineated
 - b. 50% of all other Natural Resource Overlay areas removed from BLI.
5. Title 13: 50% of Title 13 constrained acres removed from BLI (consistent with Title 13 model Ordinance)
6. Assume at least one unit per tax lot, even if fully constrained

Multi-family residential

1. Floodways: 100% removed

¹ This add back represents Metro’s approach for estimating/calculating the density transfer to mitigate the loss of potential development productivity for dwelling units.

2. Floodplain and Floodplain District: 50% removed
3. Slopes > 25%: 100% removed
4. Title 3: remove 50% of the constrained land with the other 50% considered buildable
5. Natural Resource Overlay:
 - a. 100% of Natural Resource Overlay that have been delineated
 - b. 50% of all other Natural Resource Overlay areas removed from BLI.
6. Title 13: 15% of Title 13 constrained acres removed from BLI (consistent with Title 13 Model Ordinance)
7. Assume at least one unit per tax lot, even if fully constrained

Table 1 summarizes the acreage for each constraint. Note that land can be subject to more than one constraint, and only acres outside of existing right-of-way (ROW) are counted in the table. As shown on the table, most of the environmental constraints are inventoried under Metro’s Title 13 (81 acres). The next largest constraint in Cornelius is the City’s Natural Resource Overlay (NRO) consisting of approximately 81 acres.² The third largest constraint in the City are floodplains, consisting of approximately 62 acres across the City.

Table 1: Environmental Constraints

Constraint	Total
Constraints Total:	340.3
Floodway	7.6
Slopes >25%	7.5
Floodplain	62.6
Title 3	24.8
Wetland	17.9
Natural Resource Overlay:	81.3
Delineated	33.3
Not delineated	48.0
Title 13	138.6

Both Metro’s Title 13 and the City’s NRO seek to preserve natural areas and share several overlapping areas. Similar overlapping conditions exist for several other constraints such as floodplains, floodways, and wetlands or Metro’s Title 3 and slopes greater than 25%. After accounting for overlapping natural resources, the total acreage of land with environmental constraints located in residential areas is approximately 144 acres. The overlaid constraints are deducted from the amount of buildable land as described in more detail below. Figure 1 illustrates the locations of each environmental constraint.

² The City’s NRO consists of a combination of delineated and non-delineated areas. Delineated areas apply to tax lots which have completed a delineation study to identify the exact location(s) of on-site natural resources. Non-delineated NRO areas consist of areas for which environmental resources are known to occur, but the exact location(s) have not been identified.

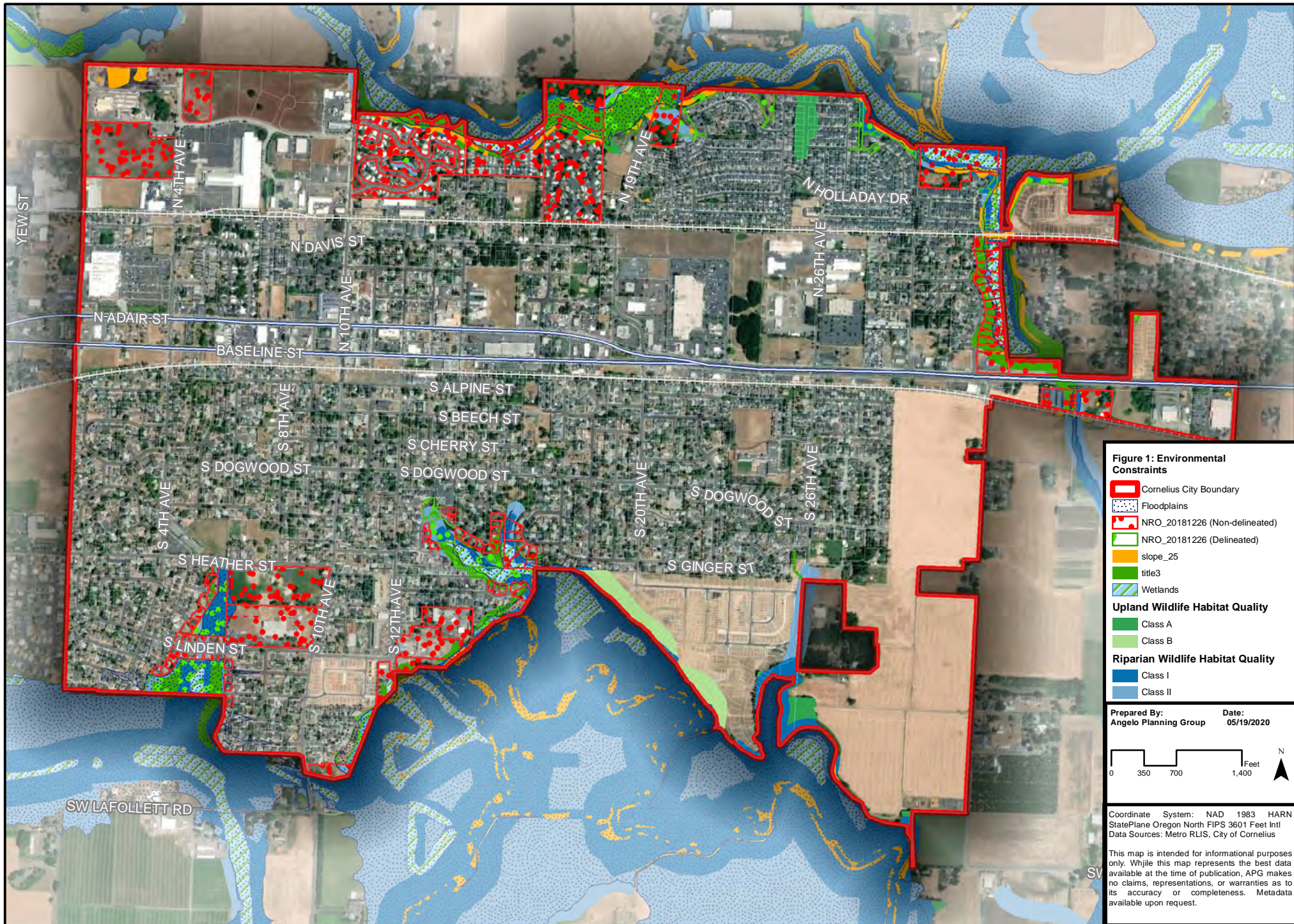


Figure 1: Environmental Constraints

- Cornelius City Boundary
- Floodplains
- NRO_20181226 (Non-delineated)
- NRO_20181226 (Delineated)
- slope_25
- title3
- Wetlands

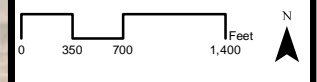
Upland Wildlife Habitat Quality

- Class A
- Class B

Riparian Wildlife Habitat Quality

- Class I
- Class II

Prepared By: Angelo Planning Group
 Date: 05/19/2020



Coordinate System: NAD 1983 HARN
 StatePlane Oregon North FIPS 3601 Feet Intl
 Data Sources: Metro RLIS, City of Cornelius

This map is intended for informational purposes only. While this map represents the best data available at the time of publication, APG makes no claims, representations, or warranties as to its accuracy or completeness. Metadata available upon request.

Step 2 – Identify Residential Land

For the purposes of this analysis, residential land is identified as the following:

- Land with a comprehensive plan designation of “Residential,” including low-density residential and mid-density residential. Zoning for residential tax lots within Cornelius’ City limits generally match comprehensive plan designation, with some small exceptions for lots with “Open Space” designations that have residential zoning. These are examined on a case-by-case basis.
- Land with a comprehensive plan designation of “Mixed Use.” While many uses are possible within this area, expanding housing opportunities is a primary development objective of the Commercial Mixed Use (CMU) district. “Development within the CMU District shall have a significant commercial element, along with medium to high density residential uses.” (CMC 153.063(C)(1))
- Other land (open space, commercial, industrial, etc.) is excluded as it does not require residential uses. Although the City’s development code allows for residential use in some of these zones, there is no guarantee that it will be used for residential development.

Table 2 summarizes the distribution of low-density, medium density, and mixed use areas by identified constraints. There is a total of 890 acres of residential land within located in the City. Of that, almost half of the residential land is designated for single-family residential uses. Most of the remainder of the residential land is designated for multi-family residential. Less than a tenth of the land is designated for mixed-use residential areas.

Environmental constraints reduce the amount of buildable residential land by just over 147 acres. The constraints are fairly evenly distributed between low-density and medium-density residential areas, though medium-density residential areas have slightly more constraints (81 acres) than low-density residential areas (66 acres). None of the mixed-use areas have constraints on them.

Table 2: Gross Acreage in Residential Land Inventory

Constraints (Acres)	Constrained		Unconstrained		Total	
Total	147.2	100%	746.5	100%	897.2	100%
Low-Density Residential	66.1	55%	363.9	49%	430.0	48%
Medium-Density Residential	81.2	45%	309.1	41%	387.7	43%
Mixed-Use	0.0	0%	73.5	10%	73.5	8%

Figure 2 illustrates all residential areas with constraints overlaid. As shown, areas with constraints are generally found near the City boundary. Most of the constraints within the City’s boundary can be found along the northern and southern limits of the City. There are no constraints centrally located within the City.

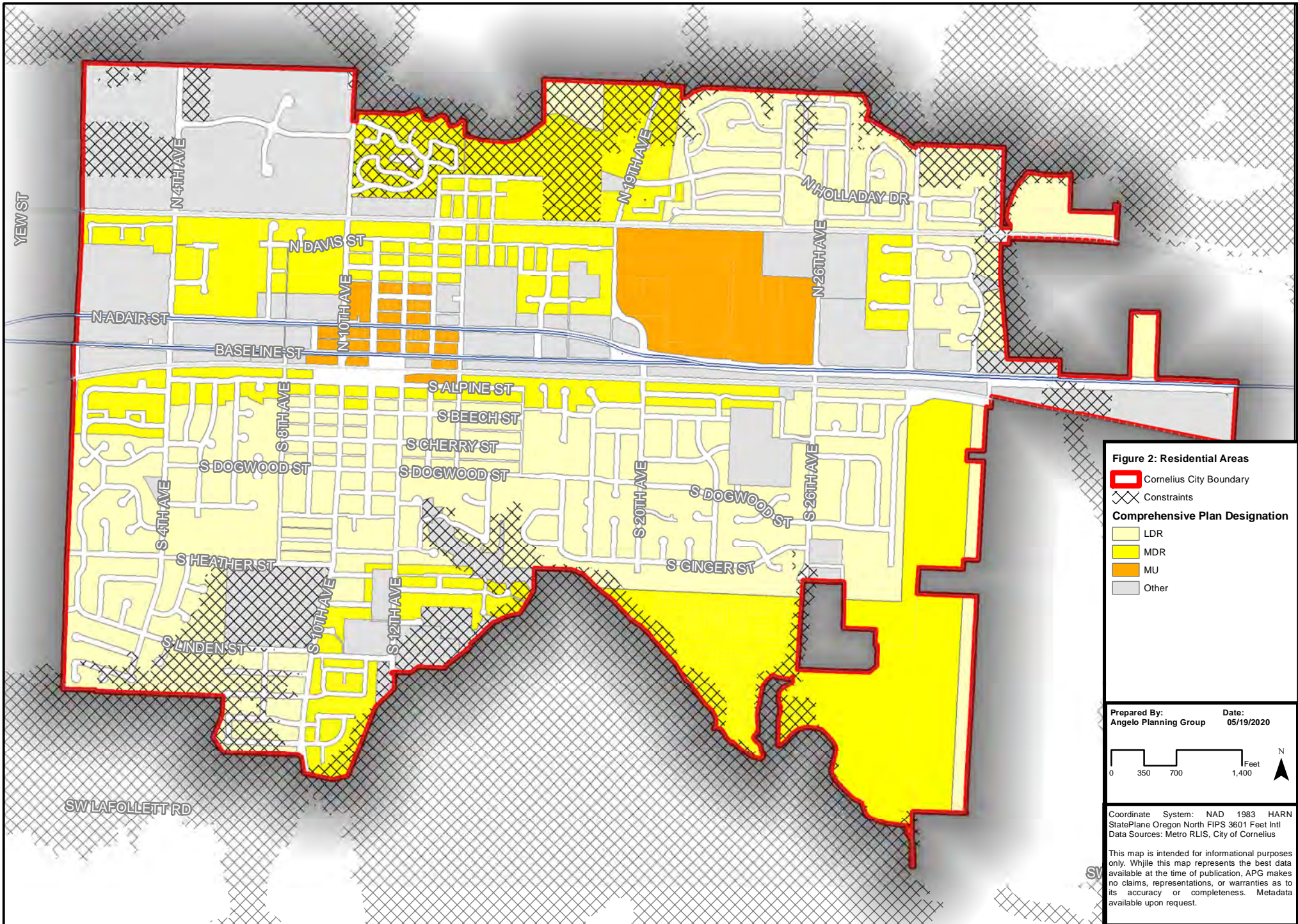
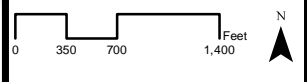


Figure 2: Residential Areas

- Cornelius City Boundary
 - Constraints
- Comprehensive Plan Designation**
- LDR
 - MDR
 - MU
 - Other

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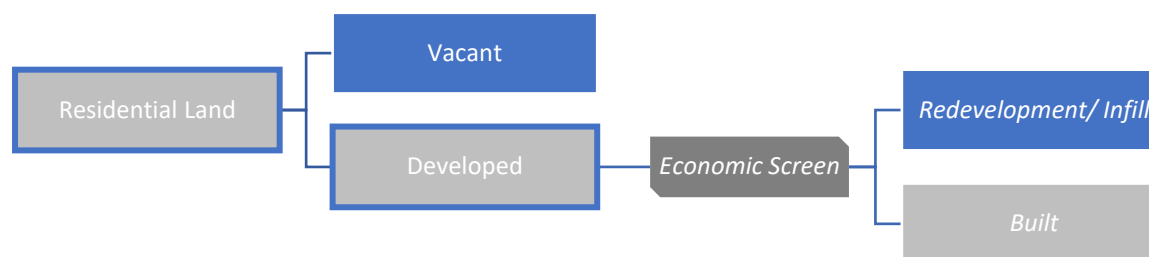
Step 3 – Identify Vacant Tax Lots (and complement developed tax lots)

This step classifies each tax lot into a set of mutually exclusive categories based on development status; this means classification into “vacant” and “developed” land.³

The region’s buildable land inventory is sorted into *vacant* and *developed* capacity. Vacant tax lots are areas that are generally undeveloped and provide relatively easy opportunities for new residential development. Developed tax lots are areas that currently have some form of residential development, some of which have the potential to allow for new residential development through redevelopment or infill development. Developed tax lots are subjected to economic screens (described in Step 6) to determine potential redevelopment/infill capacity. If a certain level of capacity is reached, the redevelopment potential is considered as part of the buildable land inventory.

Figure 3 illustrates the structure of categories for organizing the BLI.

Figure 3: Residential Land Buildable Land Structure



Vacant land is defined and identified as follows:

- Any tax lot that is fully vacant, based on Metro aerial photo.
- Tax lot with less than 2,000 sq. ft. developed AND developed portion is under 10% of the entire tax lot area.
- Tax lots that are 95% or more “vacant” from the GIS vacant land inventory.⁴

Developed land is defined as follows:

- Land developed at densities consistent with zoning and with improvements that make it unlikely to redevelop. Tax lots that are partially vacant are considered developed at this step and are screened for their redevelopment/infill potential in Step 6.

³ The BLI methodology does not identify areas with redevelopment potential until step 6.

⁴ Metro’s RLIS database, updated in January of 2020.

Step 4 – Tax Lot Exclusions.

This step removes tax lots from the BLI that do not have the potential to provide residential growth capacity. Examples of these types of exclusions include schools, parks, and churches, which are typically found in areas with residential zoning, but will not likely provide potential for additional residential capacity because they are used for or committed to non-residential purposes.

The following types of tax lots will be removed from the inventory based on Washington County Assessor PCA code designations, owner names, assessed values, and other data sources:

- Tax exempt with property codes for city, state, federal and Native American designations
- Schools
- Churches and social organizations
- Private “streets”
- Rail properties
- Tax lots under 1,000 sq. ft. (0.023 gross acres)
- Parks, open spaces and, where possible, private residential common areas

Table 3 provides a summary of the amount of land in residential areas that is excluded from the residential buildable inventory. Approximately 77 acres of land (146 tax lots) were identified as one of the uses listed for exclusion from the residential buildable inventory. Any residential development potential from lots categorized as exempt are excluded from the buildable inventory.

Table 3: Excluded Land

Jurisdiction/Status	Number of Tax Lots	Unconstrained Acres
Total:	3,285	746.4
Developed	2,795	535.7
Vacant	386	133.6
Exempt	104	77.2

Step 5 – Calculate Deductions for “Future Streets”

A portion of the vacant land supply is set aside for future right-of-way as follows:

- Tax lots under 3/8 acre assume 0% set aside for future streets.
- Tax lots between 3/8 acre and 1 acre assume a 10% set aside for future streets.
- Tax lots greater than an acre assume an 18.5% set aside for future streets.

Table 4 summarizes the right-of-way set-asides by development status. The set-asides are removed from the unconstrained acreage for each tax lot. The set-asides result in a reduction of approximately 18 acres from the buildable inventory.

Table 4: Land Deductions⁵

	Unconstrained Acres	Net Acres (ROW Removed)
Total:	669.2	651.4
Developed	535.7	535.7
Vacant	133.6	115.8

Step 6 – Estimate Potentially Buildable Lands and Housing Unit Capacity (Includes Capacity Estimates for Vacant and Redevelopment Land)

Once the net unconstrained land (buildable land with no environmental constraints) has been calculated, then the estimated number of units for vacant and developed land can be calculated.

Step 6 involves multiple calculations and economic screening to estimate the potential buildable land capacity. The calculations and screening are completed in the following order.

- Assign Parcels to Zones
- Estimate Capacity within Vacant Land
- Conduct Screening on Developed Land
 - Estimate Infill Capacity
 - Estimate Redevelopment Capacity

Assign Parcels to Zones

Only land which allows for and assumes residential development within the Cornelius Municipal Code is considered part of the Residential BLI. As such, areas are assigned a zoning district, which includes minimum and maximum densities. Land is classified by zone type (residential, mixed use, etc.) to estimate the amount of land that is potentially developable. To do this, each parcel is assigned a zone.

⁵ Net acres with ROW removed does not use the weighted unconstrained acreage. Calculations for other capacity are based on the weighted unconstrained acreage.

Table 5 provides a summary of City zoning that is applied to developed and vacant land in the inventory.

Table 5: Developed and Vacant Land by Zone

Zoning	Unconstrained Acres*	Number of Tax Lots
Total:	651.4	3,181
Developed:	535.7	2,795
A2	107.2	612
CMU	9.7	51
CR	30.1	132
GMU	44.0	9
MHP	17.9	30
R7	326.8	1,961
Vacant:	115.8	386
A2	91.8	280
CMU	1.5	5
CR	0.5	3
GMU	7.6	1
MHP	0.9	3
R7	13.5	94

*Vacant land includes removal of ROW. Constrained and exempt land removed from developed and vacant areas.

Estimate Capacity within Vacant Land

For vacant lots with single family or multifamily zoning, the net developable acreage for each tax lot is simply multiplied by the minimum and maximum density allowed within that zone. For vacant lots with mixed use zoning, the potential number of units is based on minimum square footage of units, maximum number of stories, and maximum or minimum density standards, should they exist. For properties that have received land use approval for development but not yet been developed, capacity reflects the amount of development approved.

Conduct Economic Screening to Estimate Infill and Redevelopment Capacity

Infill. Infill development represents development within single-family zoning where a lot may be sufficiently large to allow homeowners to divide their lot and build an additional housing unit on the previously undeveloped portion. According to the Metro BLI, the following conditions must be met for a single-family zoned tax lot to potentially allow for infill development:

- If the tax lot is zoned single family residential and classified developed, it was assumed that one single family unit presently exists on the tax lot regardless of what's indicated on the assessor's land use code. The one exception to this rule is for tax lots in single-family zoned areas that have current land use for an apartment (according to Metro's multifamily

residential database). These parcels were not considered in calculating infill potential for single family infill supply (as any infill of such land use with this type of zoning would yield a single-family dwelling unit with the associated loss of the multi-family units, which would be unlikely). Lots greater than 2.5 times the minimum zoned lot size are included in the infill supply, except:

- In addition to meeting the size threshold, the assessor’s real market building value must be below \$300,000 to be counted in the infill supply (since lots with higher value homes would be excluded from the infill supply).
- Tax lots that exceed the minimum zoned lot size by a factor of five are passed through into the infill supply regardless of building value.

As such, each lot that is categorized as part of the infill supply is assumed to have the capacity for additional units.

The net capacity for additional dwelling units on eligible infill tax lots is generated using the calculations summarized below. The net additional infill units are calculated as the lower of the following two computations. Tax lots can end up with zero additional infill units.

- Additional DU infill= (Calculated area of TL – min lot size) / min lot size (rounded down to a whole number); can equal 0.
- Additional DU infill = (net unconstrained sq. ft. / 2,000 sq. ft.), rounded down to a whole number; can equal 0.

Accessory Dwelling Units (ADU). ADU capacity is reported in probabilistic terms by geographic location within Metro’s UGB. Each single family tax lot is assigned a small probability of having an ADU built there. The probability ranges from 9% in central Portland locations to 0% for suburban areas near the UGB. Cornelius is assumed to have 0% capacity for the purpose of this BLI.

Redevelopment. If the tax lot is zoned for multi-family residential development or mixed-use residential development and is classified as developed, then the redevelopment capacity would have to meet a “units requirement” in addition to the economic requirements described previously. This inventory uses Metro’s “strike price” methodology to determine if the requirements are met.

Units requirement. The multi-family or mixed-use residential redevelopment must add at least 50% more units over the number of units which already exist, or produce at least three units total to be counted towards redevelopment potential. The rationale is that developers would not tear down and redevelop an apartment or condo units unless they could yield a significant gain in rents and dwelling units. Elements of this methodology include:

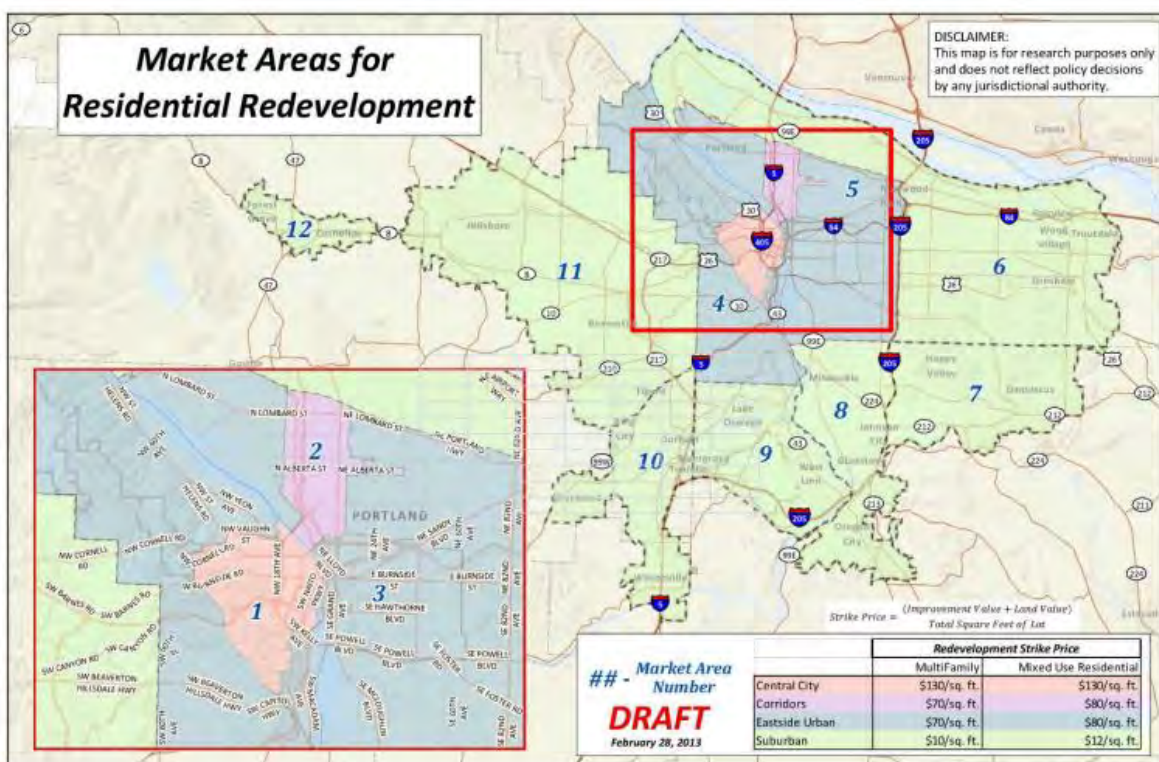
- Redevelopment of a multi-family structure must add at least 50% more units; if it doesn’t, the tax lot is not counted.
- If the structure is a commercial (or industrial) building or single-family dwelling unit (in a multi-family or mixed-use zone), the redevelopment must yield at least three or more dwelling units

- Redevelopment must pass through an economic filter first before evaluation of additional dwelling units through redevelopment (see below for economic filter thresholds)

Note, for several parcels, development approvals for specific numbers of units exist. These approvals have been used to assign these lots a development capacity that matches the number of units already approved.

Strike Price Requirement. The “strike price” is used to indicate the price at which point it becomes cost effective for a developer to consider a site for redevelopment. Metro’s strike prices are based on current market conditions but are pushed to a modest degree to acknowledge that demand will increase over time. Strike prices also vary by market subarea. As shown in Figure 4, the study area is located entirely within the “Suburban” market subarea category. The strike prices are \$10 per square foot for multi-family development and \$12 per square foot for mixed-use development.

Figure 4: Market Areas for Residential Development (Metro BLI, 2018)



RESULTS

The results of Draft 1 of the BLI are presented in Tables 6 through 8 and illustrated in Figure 5.

Table 6: BLI Summary

Development Status	Tax Lots	Total Acres	Constrained Acres	Unconstrained Acres⁶
Total	3,475	1,202	184.1	1,017.9
Not Buildable	3,019	964.3	158.1	806.2
Built Out	2,876	796.4	105.8	690.6
Exempt	143	167.8	52.2	115.6
Potentially Buildable	456	237.7	26.0	211.7
Infill	54	30.1	2.8	27.3
Redevelopment	15	48.1	8.1	40.0
Vacant	387	159.5	15.1	144.4

As summarized in Table 7, Cornelius has an estimated 211 acres of unconstrained residential land with some form of additional capacity. Most of the additional capacity is available through vacant land (approximately 144 acres). Most of this land is located in southeast Cornelius and has received recent land use approval for multi-phase development. While that area is approved for development, it will continue to represent additional capacity until homes are constructed there. The remainder of buildable land (approximately 68 acres) is distributed between infill and redevelopment categories. Of that, most of the potential capacity is through redevelopment (approximately 40 acres).

Almost three-fifths of the buildable land is zoned for Multi-Family Residential (approximately 130 acres). Buildable areas with Single-family Residential and Gateway Mixed-Use zones comprise approximately one-sixth of buildable land each (approximately 31 and 35 acres respectively). With one exception, the supply of buildable land in all other zones is less than three acres each. The one exception is the Core Residential zone with approximately 11 acres of buildable land.

⁶ The measurement of “Unconstrained Acres” is lower than “Gross-Constrained” because an additional deduction is made for developed parcels that have infill capacity to account for an existing structure. It is assumed that the existing structure remains and other land on the parcel is developed.

Table 7: Unconstrained Acres by Zone, Residential Zones

Zone	Projected Density	Unconstrained Acres				
		Vacant	Infill	Redev.	Total	Share
Total		144.4	28.5	40.0	212.9	100%
Single-Family Residential (R-7)	4-5/acre	14.0	17.5		31.5	15%
Manufactured Home Park (MHP)	max 10/acre	1.2			1.2	1%
Multi-family Residential (A-2)	8-14/acre	117.8		12.4	130.2	61%
Central Mixed-Use (CMU)		1.6		1.3	2.9	1%
Core Residential (CR)	min 8/acre	0.5	11.1		11.5	5%
Gateway Mixed Use (GMU)		9.3		26.4	35.7	17%

Table 8 provides a summary of the additional housing unit capacity for each zone. The housing unit capacity is determined by the projected density for each zone. Overall, there is an estimated capacity for over 2,122 additional dwelling units. Similar to the amount of unconstrained acreage, vacant areas account for most of the capacity with over 1,300 units. Most of this land is located in southeast Cornelius and has received recent land use approval for multi-phase development. Infill and redevelopment land accounts for under 800 units of the estimated capacity. Most of this potential capacity is through redevelopment in Multi-Family Residential and Gateway Mixed-Use zones (approximately 642 units).

For vacant land, the distribution of zoning is heavily concentrated in the Multi-Family Residential zone (approximately 983 units). Vacant Single-family Residential and Gateway Mixed-Use zones account for over 100 units each. Vacant land in all other zones account for approximately 32 units. Most of the remaining vacant unit development potential is anticipated to be in the Central Mixed-Use zone.

The capacity for additional dwelling units in the infill category is relatively distributed between the Single-Family Residential and Core Residential zones. The available supply of Infill land in the Single-Family Residential zone accounts for over 80 potential units in the inventory, while the Core Residential zone accounts for over 65.

The redevelopable supply of land accounts for under 650 additional dwelling units in the supply. Of that, most the units are anticipated to be available in the Gateway Mixed-Use zone (approximately 420 units). Most of the remaining redevelopable capacity is expected in the Multi-Family Residential zone (approximately 208 units) The remaining potential supply of additional units is anticipated to be in the Central Mixed-Use zone with approximately 14 additional units.

Table 8: Housing Unit Capacity by Zone, Residential Zones

Jurisdiction and Zone	Projected Density	Capacity				Total	Share
		Vacant	Infill	Redev.			
Total		1,333	147	642	2,122	100%	
Single-Family Residential (R-7)	4-5/acre	106	81		187	9%	
Manufactured Home Park (MHP)	max 10/acre	11			11	1%	
Multi-family Residential (A-2)	8-14/acre	983		208	1,281	60%	
Central Mixed-Use (CMU)		16		14	30	1%	
Core Residential (CR)	min 8/acre	5	66		71	3%	
Gateway Mixed Use (GMU)		122		420	542	26%	

Figure 5 illustrates the location of vacant and infill/redevelopment areas within the City of Cornelius.

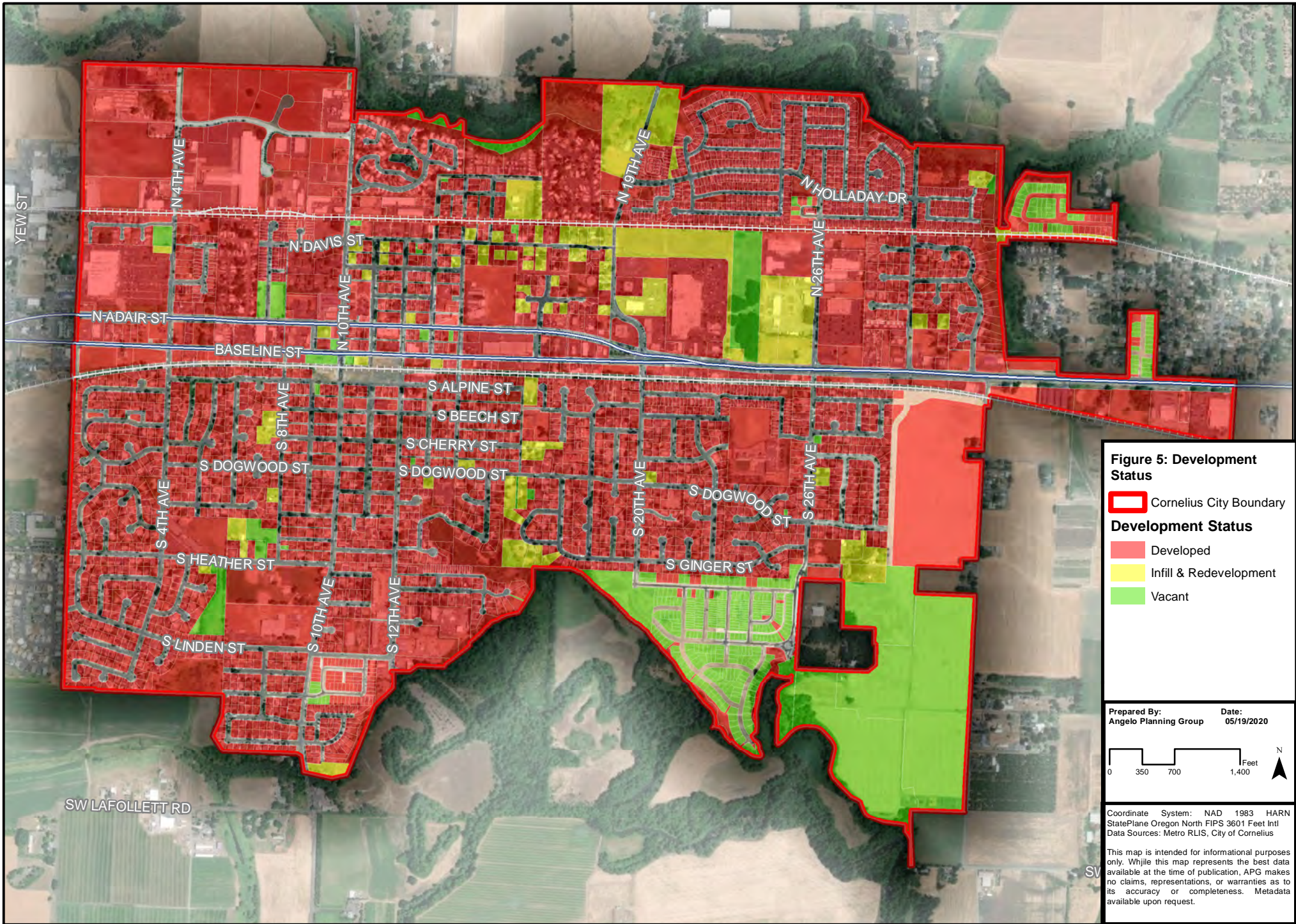


Figure 5: Development Status

Legend

- Cornelius City Boundary

Development Status

- Developed
- Infill & Redevelopment
- Vacant

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