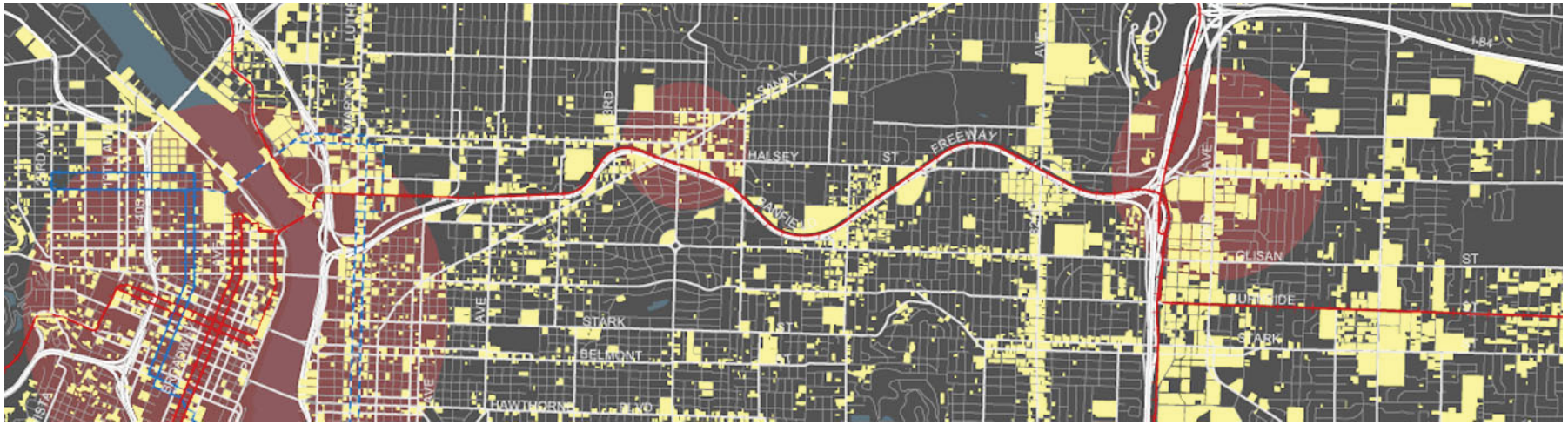
City of Portland Development Capacity Analysis

development capacity analysis GIS model



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overview

The City of Portland is currently engaged in an effort – the Portland Plan – to plan for the long-term future of our city. In order to discuss the future of Portland, it is important to establish a basic understanding of the City today. The Bureau of Planning & Sustainability's Development Capacity Analysis geographic information systems (GIS) model provides information about the amount of existing and allowed residential and commercial development that is useful for establishing our current and future housing and employment capacity.

Maximum land use intensities in Portland are controlled in three ways:

1. establishing floor area ratio (FAR) limit and maximum height limits. FAR is the ratio of a building's total square footage to the square footage of the underlying development parcel; or
2. limiting the total number of multi-family residential units; or
3. assigning minimum lot sizes for new single-family residential development.

These limits govern building size and bulk, and – among other objectives – create reasonable certainty for utility and transportation providers regarding the intensities of use for which they must provide infrastructure. FAR and building height limits are the primary limiting factor on development in employment, commercial, and high-density residential areas. In multi-family and single-family residential areas, capacity is based on the allowed number of residential units, rather than maximum building square footages. The specific criteria for determining allowed capacity are described in detail in the Methodology section of this document.

All development capacity analysis is based on the City of Portland's "Comprehensive Plan Designations" rather than existing zoning. The Comprehensive Plan Designations reflect the current adopted land use plan for the City of Portland. This plan guides the future growth and development of the city.

There are several reasons for conducting this analysis:

- to quantify the existing development capacity within Portland under current zoning regulations;
- to identify likely redevelopment scenarios and prospective clusters of future development activity by identifying sites that are significantly underutilizing their allowed development capacity;
- to generate development capacity statistics for different areas of the City to highlight the differences in terms of existing and allowed development capacity;

› to serve as a basis for predicting residential and employment growth under different development scenarios.

Important note: This is a "supply-side" analysis. The model does not predict market demand for new construction. It only identifies lands within the City that could potentially become available for development/redevelopment should market demand exist.

methodology

The Development Capacity Analysis geographic information systems (GIS) model consists of 3 basic steps:

1. calculate existing development and allowed development limits (in terms of building square footage, number of multi-family residential units, and number of allowed single-family residential lots);
2. identify constrained properties that are not likely to develop (i.e., significant environmental or historic resources);
3. identify development parcels that significantly underutilize their allowed development capacity.

Each of these steps is discussed in detail in the following sections. Refer to the Model Inputs section below for more information on each of the GIS data inputs (development parcels, 3D building model, etc.).

1. Calculate existing development and allowed development limits

The first step in the development capacity model is to calculate existing development and allowed development limits. This allows for a determination of how much of each development parcel's allowed capacity is being used (or not used). **Figure 1** presents an overview of this process, described in detail below.

Existing development

Existing building square footages are calculated using the City of Portland's 3D building model. Where building square footage is known (meaning the 3D building GIS dataset building "feature" is attributed with a known square footage), that information is used by the model. Known square footages are usually derived from building permit information, but other sources are used as well (such as information from the building's developer).

If the building square footage is not known, it is estimated using the 3D building model. First, a predominant use is assigned to each building based on the Multnomah County Assessor "property codes". The property codes are consolidated into a small number of general categories – office, institutional, multi-family residential, etc. – and each one of these general categories is assigned an average floor-to-floor height based on standard development practices relating to each use. These assumptions are shown in **Table 1**.

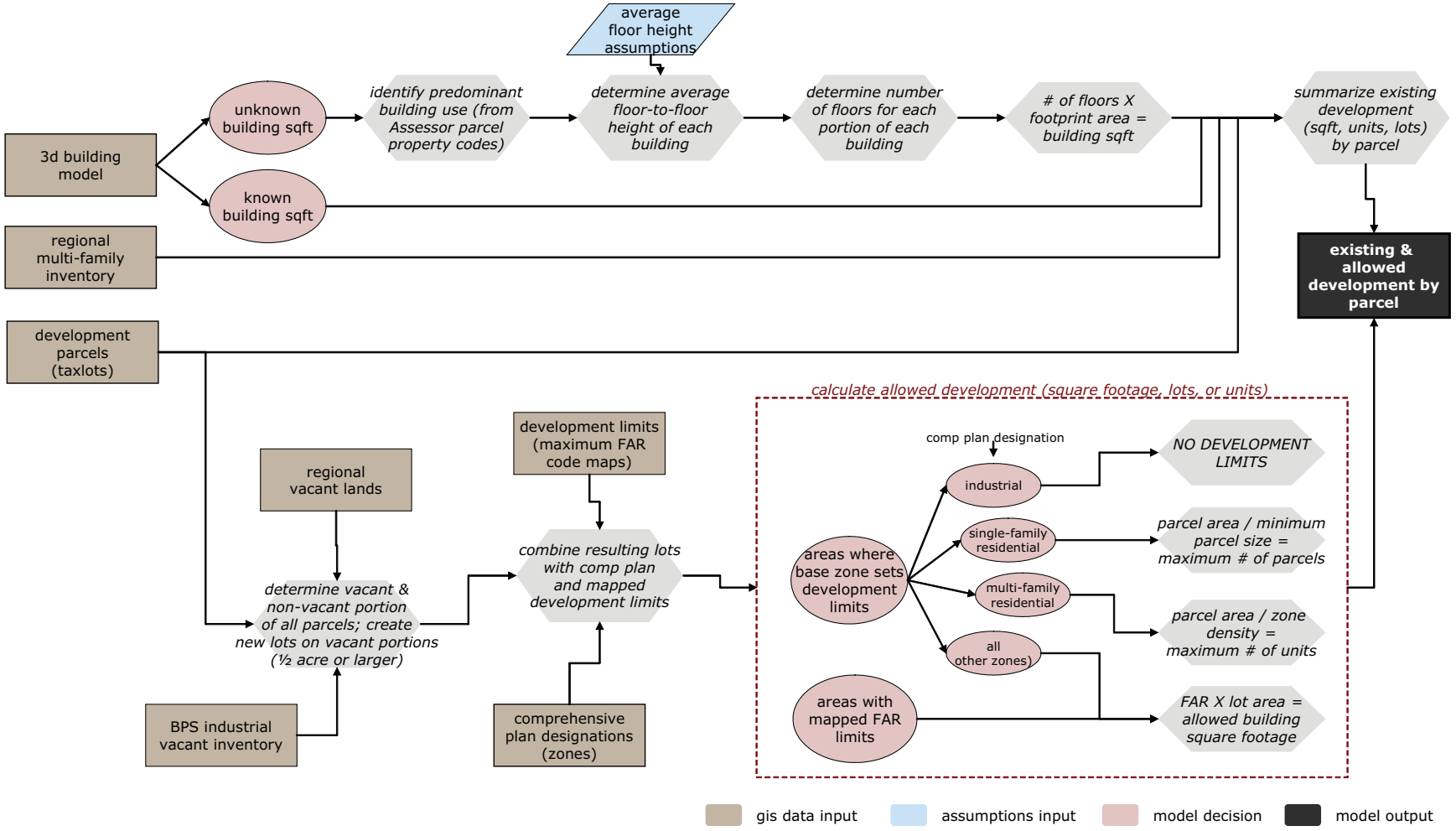


Figure 1. Development Capacity Analysis GIS model Step #1: Calculate existing and allowed development.

Table 1: Average floor-to-floor height assumptions by predominant building use.

use	average floor-to-floor height
commercial	14'/19'*
industrial	19'
institutional	12'/14'/19'*
multi-family residential	10'
office	14'
single-family residential	10'
all other uses/unknown use	12'

* floor height depends on the specific use. For example, a building with a "big box" retail property code (commercial use) is assigned a height of 19'

Next, the number of stories for each portion of each building – each *polygon* making up the building's form -- is determined by dividing the height of the polygon by the average floor-to-floor height as determined by the predominant building use. The base area – or *footprint* – of each component polygon is multiplied by the number of stories to arrive at the total estimated floor square footage for that portion of the building. The total square footage of the building is calculated by combining the square footage of all the component polygons.

The total building square footage for each development parcel is then calculated as the total square footage of all buildings on the parcel. Because some parcels contain only a portion of a building's footprint, square footages are weighted based on the percentage of the building footprint within each parcel. **Figure 2** illustrates this process.

Existing number of multi-family housing units are derived from Metro's regional Multifamily Housing Inventory.

Allowed development capacity

Before calculating the allowed development capacity of each parcel, portions of parcels that have been identified as vacant by Metro (in their regional vacant lands inventory) or the Bureau of Planning & Sustainability (in their industrial/employment lands inventory) are divided into "new" development parcels. This allows these areas to be evaluated separately from the larger lot that they are within.

(a) height of each building polygon is derived from the 3D model

(b) each polygon is divided into floors; each floor's square footage can then be calculated

(c) total square footage of each building polygon is then assigned to a parcel based on the % area in each parcel

Figure 2. Estimating total building development parcel building square footage.

There are two ways the specific development limits are applied to parcels in Portland:
1. specific Planning and Zoning Code maps that delineate FAR and height limits for particular areas of the City (such as the Central City Plan District); or
2. through development limits related to the parcel's zone.

Figure 3 illustrates. If there is no code map showing a development limit for the parcel, than the comprehensive plan designation determines the limits. Note that some designations, like "industrial sanctuary", have no development limits.

The parcel data is combined with both the code map GIS data and the zoning GIS data (which contains both current zoning and comprehensive plan designations). For each parcel, a determination is made as to which of these two apply. Once this is determined, allowed development capacity is calculated as follows:

1. areas with mapped FAR limits (per code maps)

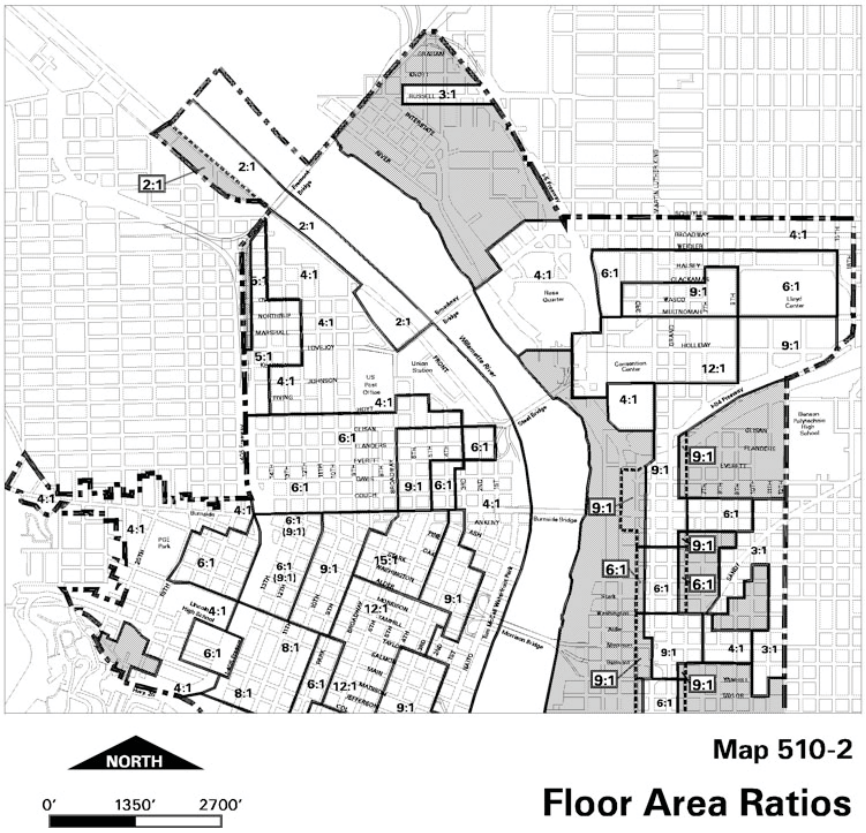
Where FAR limits are determined by a code map, the total allowed FAR is calculated by multiplying the lot area by the FAR limit. For example, a 20,000 square foot lot with a FAR limit of 4:1 would have an allowed development capacity of 80,000 square feet. Note that the model only considers "base" FAR. Any additional FAR – *bonus FAR* – that results from having certain amenities (i.e., bike parking) or building features (i.e., ecoroofs) are not currently taken into consideration when determining "underutilized" lots. They are, however, calculated for each lot where the bonus FAR limit is known, so this information is in the output dataset.

2. areas where the base zone sets development limits

Where the development limits are determined by the base zone, development limits can be expressed as not only building square footage, but – in residential zones – as allowed lots and residential units as well. The limits are calculated as follows:

i. industrial parcels (IS zones): no development limits (FAR and height limitations do not apply to industrially-zoned lots).

ii. single-family residential parcels (R2.5, R5, R7, R10, R20 & RF zones): development limits are expressed as the allowed number of development parcels based on the minimum lot size of the zone. The total parcel area is divided by the minimum lot size to determine the total number of allowed parcels. If, for example, a parcel in an R5 zone is 20,000 square feet, that parcel could be subdivided into four 5,000 square foot lots (the minimum lot size in a R5 zone is 5,000 square feet.) Note that resulting values are rounded differently based on the maximum number of lots. Refer to the Single-Dwelling Zones Land Division Guide for more information.



(a) FAR limits map from Title 33 zoning code

Table 130-3
Summary of Development Standards in Commercial Zones

Standard	CN1	CN2	CO1	CO2	CM	CS	CG	CX
Maximum FAR (see 33.130.205)	.75 to 1	.75 to 1	.75 to 1	2 to 1	1 to 1 See 33.130.253	3 to 1	3 to 1	4 to 1
Maximum Height (see 33.130.210)	30 ft.	30 ft.	30 ft.	45 ft.	45 ft.	45 ft.	45 ft.	75 ft.
Min. Building Stbks (see 33.130.215) Street Lot Line or Lot Line Abutting an OS, RX, C, E, or I Zone Lot	0	0	0	0	0	0	0	0
Lot Line Abutting other R Zoned Lot	See Table 130-4	See Table 130-4	See Table 130-4	See Table 130-4	See Table 130-4	See Table 130-4	See Table 130-4	See Table 130-4
Garage Entrance Setback (see 33.130.250.E)	5/18 ft	5/18 ft	5/18 ft	5/18 ft	5/18 ft	5/18 ft	5/18 ft	5/18 ft
Max.Building Stbks (see 33.130.215) Street Lot Line Transit Street or Pedestrian District	None 10 ft.	None 10 ft.	None 10 ft.	None 10 ft.	10 ft. None	10 ft. None	None 10 ft.	None 10 ft.

(b) FAR limits as determined by zone

Figure 3. Examples of 2 different methods of applying development limits to parcels.

iii. multi-family residential parcels (R1, R2, R3 & IR zones): development limits are expressed as the allowed number of residential units based upon maximum density of the zone. The total parcel area is divided by the maximum density to determine the total number of allowed units. If, for example, a parcel in an R1 zone is 20,000 square feet, that parcel is allowed 20 multi-family units (the minimum zone density in a R1 zone is 1,000 square feet.) Note that resulting values are rounded differently based on the maximum number of units. Refer to the Multi-Dwelling Zones Land Division Guide for more information.

iv. all other high-density residential, mixed use commercial, and employment parcels (CG, CS, CX, EX, IR, ME, NC, OC, RH, RX & UC zones): development limits are expressed as the allowed building square footage based on the maximum floor-area ratio (FAR). The total parcel area is multiplied by the maximum FAR to determine the total allowed building square footage. If, for example, a 20,000 square feet parcel has an FAR of 4:1, an 80,000 square foot building is allowed on that lot. Note that only "base" FAR is considered. Maximum FAR of comprehensive plan designations are determined by comparing them with existing base zones. Comprehensive plan FAR limits used by the development capacity model are listed in **Table 2**.

The final output of Step 1 of the model is a GIS dataset that contains the existing building square footage and allowed development (total square footage, number of units, or number of parcels) for every parcel within the City of Portland.

2. Identify "constrained" properties that are not likely to develop

The second step in the Development Capacity Analysis model is to identify "constrained" properties where development is limited or not desirable. Constrained properties are excluded from the determination of Portland's total available development capacity. **Figure 4** summarizes the process of identifying constrained properties. The specific types of constraints are described in detail below.

Table 2. Maximum base floor-area-ratios (FAR) by comprehensive plan designation (for GIS modeling purposes)

comp plan designation	FAR
CG	3:1
CS	3:1
CX	4:1
EX	3:1
IR	2:1
IS	N/A
ME	1:1
NC	.75:1
OC	1:1
OS	0:1
R1	N/A
R10	N/A
R2	N/A
R2.5	N/A
R20	N/A
R3	N/A
R5	N/A
R7	N/A
RF	N/A
RH	2:1
RX	4:1
UC	3:1

Types of constrained properties

There are several types off constrained properties that the DCA model identifies:

1. "high value" Natural Resource Inventory (NRI) areas: areas within the City that have been identified as having high riparian and/or wildlife habitat resource value based on the Bureau of Planning & Sustainability's Natural Resource Inventory GIS Model. These areas contain valuable natural resources; therefore, development in "high" value areas is usually not desirable.

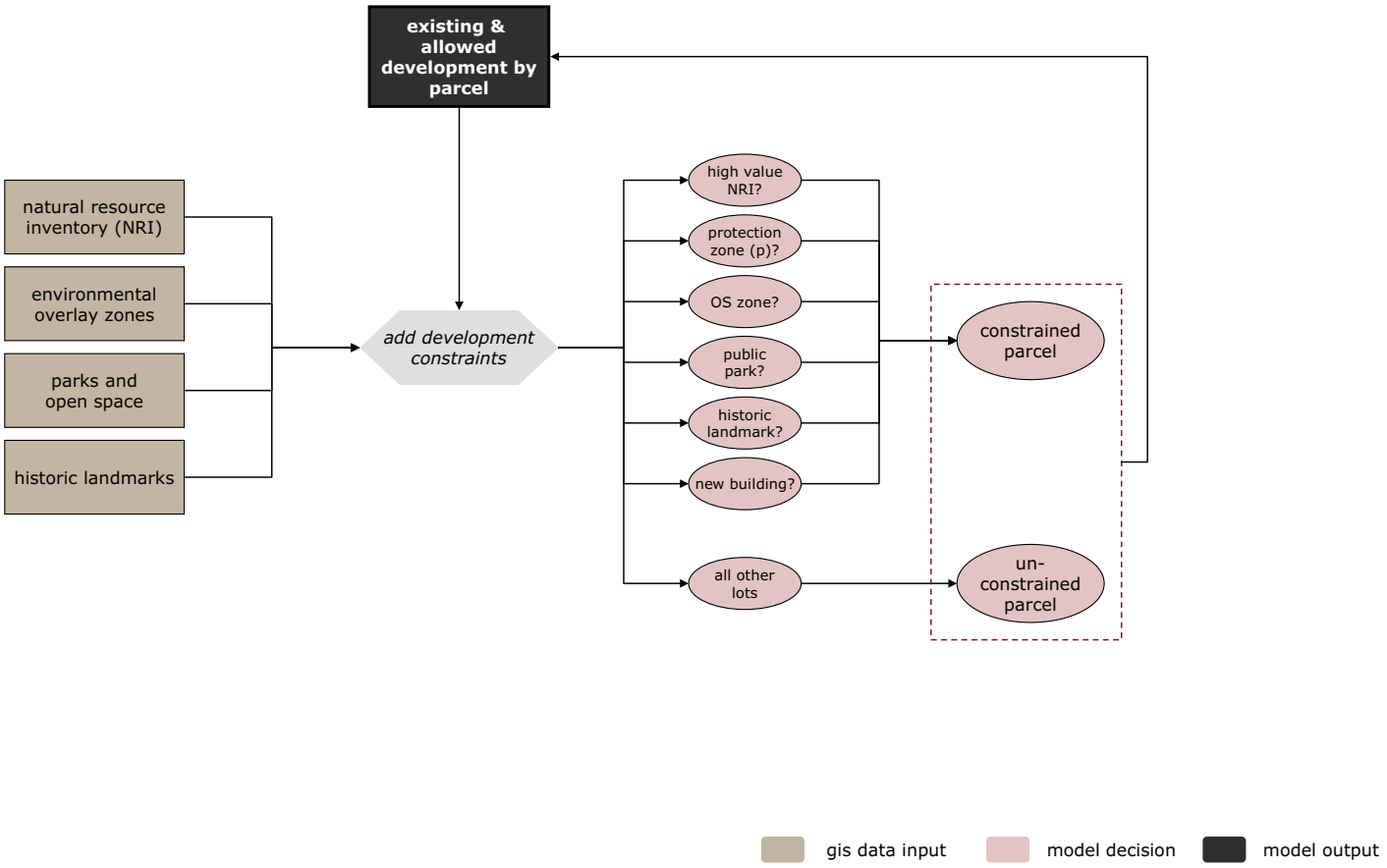


Figure 4. Development Capacity Analysis GIS model Step #2: Identify constrained properties.

The factors that determine whether an area receives a high value include proximity to streams and wetlands and presence of flood plain or vegetation. For a complete description of the Natural Resource Inventory Update project, refer the NRIU Project website. Refer to the NRI GIS Model Report for specific information on the GIS model ranking criteria, data sources, and data outputs. *Note that the high value areas used by the development capacity model excludes areas ranked high ONLY because they are within a "special habitat area".*

2. areas within a designated protection zone ('p' overlay): areas within an existing environmental protection overlay per City of Portland zoning maps. The environmental protection zone provides the highest level of protection to the City's most important natural resources. Development will be approved in the environmental protection zone only in rare and unusual circumstances. For more information on the City's environmental overlay zones, refer to Chapter 33.430 of the City of Portland Planning and Zoning Code.

3. Open Space zones (OS): areas designated as open space zoning, which is intended to intended to preserve and enhance public and private open, natural, and improved park and recreational areas identified in the Comprehensive Plan. For more information, refer to Section 33.100 of the Planning and Zoning code.

4. publicly-owned parks and community centers.

5. Federal, State, and local landmarks: parcels officially registered as historic landmarks.

6. lots with buildings constructed in the last 10 years. It is unlikely newer buildings will be demolished due to economic constraints (cost of purchasing the land and building, demolition costs, etc.).

3. Identify development parcels that significantly underutilize their allowed development capacity

The final step in the Development Capacity Analysis model is to identify parcels that are significantly underutilizing their allowed development capacity, which is determined in Step #1 above. **Figure 5** provides an overview of the process, described in detail below.

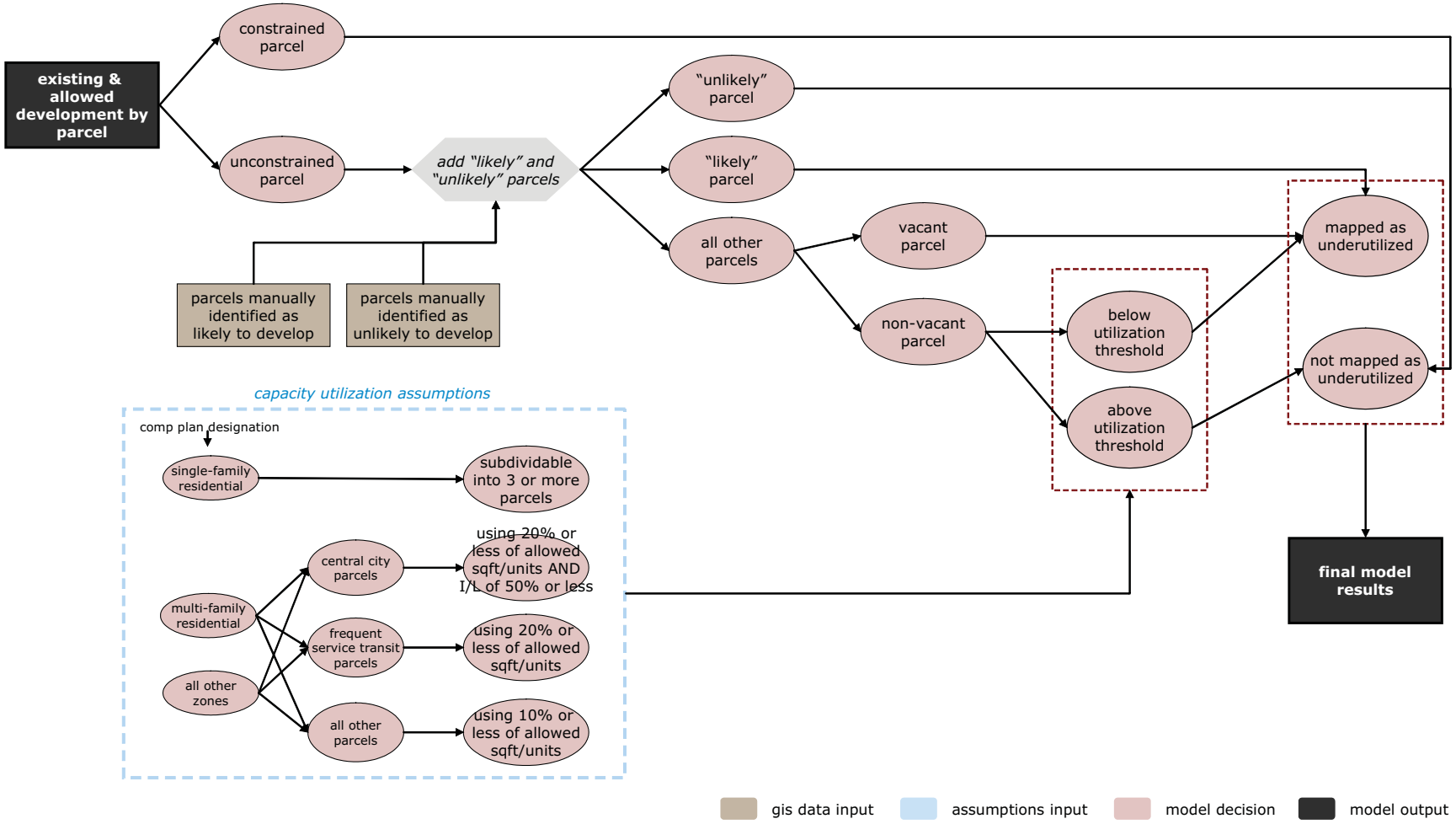


Figure 5. Development Capacity Analysis GIS model Step #3: Identify underutilized parcels.

Constrained properties

Parcels or portions of parcels identified as "constrained" in Step #2 above are not mapped as underutilized. Note that the existing building square footages and allowed development capacity *have* been calculated for these areas, so the total available development capacity can be calculated from the final DCA model results.

Unconstrained properties

Unconstrained properties are evaluated as follows:

1. "Likely" & "Unlikely" parcels

The initial outputs of the Development Capacity Analysis GIS model were reviewed thoroughly by Bureau of Planning & Sustainability staff. Based on staff knowledge, parcels that were known to have high development or redevelopment potential and were not identified by the model as underutilized were "manually" flagged as underutilized and included in subsequent model outputs. These "likely" parcels are all mapped as underutilized regardless of the existing or allowed development capacity.

Parcels that were not identified as constrained in Step 2 of the model, but that are known to have a very low likelihood for development or redevelopment, were manually flagged as "unlikely" to develop, and therefore not included in the final map of underutilized parcels.

2. All other parcels

All non-constrained vacant parcels are mapped as underutilized, regardless of the allowed development capacity. Parcels are identified as vacant by Metro, in their regional vacant lands inventory, or the Bureau of Planning & Sustainability in their industrial/employment lands inventory. In addition, any non-industrial parcels where less 10% or less of the site area is developed AND where the Multnomah County Assessor has recorded the current land use as "vacant" are included in the vacant category. Portions of a parcel larger than ½ acre that are mapped as vacant are considered a separate parcel and are treated as such in all 3 steps of the DCA model.

Non-vacant parcels are individually identified as "significantly underutilized" if they are below the capacity utilization threshold defined for their comprehensive plan designation. The following assumptions determine whether a parcel is above or below this utilization threshold:

i. industrial parcels (IS zones): industrially-zoned parcels can not be evaluated because there are no FAR or other similar limits on allowed development. As a result, *only vacant industrial properties are mapped as significantly underutilized*.

ii. single-family residential parcels (R2.5, R5, R7, R10, R20 & RF zones): single-family residential (SFR)-zoned parcels that can be subdivided into 3 or more parcels – calculated using the land division assumptions in Step #1 of the DCA model – are mapped as underutilized. Note that the number of allowed parcels is rounded differently based on the maximum number of parcels. Refer to the Single-Dwelling Zones Land Division Guide for more information.

iii. multi-family residential parcels (R1, R2, R3 & IR zones):

a. parcels within the Central City: mapped as underutilized if they are using less than 20% of their allowed multi-family units AND the parcel's improvement-to-land value ratio is 50% or less. Existing units are calculated using Metro's regional Multifamily Housing Inventory. Improvement-to-land ratios are calculated using Multnomah County Assessor real market land and improvement (building) values for the current tax year.

For example, a 20,000 square foot R1 parcel that currently has 2 existing units, an improvement value of $50,000 and a land value of $200,000. The percentage of capacity used by this parcel is calculated as:

$$\frac{number\ of\ existing\ units}{parcel\ area \div zone\ density} = \frac{2}{20{,}000 \div 1{,}000} = \frac{2}{20} = 10\%$$

Note that the number of allowed units is rounded differently based on the maximum number of units. Refer to the Multi-Dwelling Zones Land Division Guide for more information.

The improvement-to-land ratio of this parcel is calculated as follows:

$$\frac{improvement\ value}{land\ value} = \frac{\$50{,}000}{\$200{,}000} = 25\%$$

In this Central City parcel example, the parcel is mapped as underutilized because the percentage of capacity used is less than 20% AND the improvement-to-land ratio is less than 50%.

b. parcels outside the Central City but within 500' of a "frequent service" transit line: mapped as underutilized if they are using less than 20% of their allowed multi-family units (regardless of the improvement-to-land ratio). Improvement and land values are not as accurate or consistently recorded outside Portland's Central City, so they are not used in other parts of the City at this time. Frequent service transit lines are defined as bus and light rail lines that run every 15 minutes or better during weekday peak hours.

c. all other parcels: mapped as underutilized if they are using less than 10% of their allowed multi-family units (regardless of the improvement-to-land ratio).

iv. all other high-density residential, mixed use commercial, and employment parcels (CG, CS, CX, EX, IR, ME, NC, OC, RH, RX & UC zones):

a. parcels within the Central City: mapped as underutilized if they are using less than 20% of their allowed floor-area ratio (FAR) building square footage AND the parcel's improvement-to-land ratio is 50% or less. Improvement-to-land ratios are calculated using Multnomah County Assessor real market land and improvement (building) values for the current tax year.

For example, a 20,000 square foot parcel that currently contains a 10,000 square foot building has a FAR of 5:1, an improvement value of $50,000 and a land value of $200,000. The percentage of capacity used by this parcel is calculated as:

$$\frac{existing\ building\ square\ footage}{parcel\ area \times FAR} = \frac{10{,}000}{20{,}000 \times 5} = \frac{10{,}000}{100{,}000} = 10\%$$

The improvement-to-land ratio of this parcel is 25%, calculated per the multi-family example above. This Central City parcel is mapped as underutilized because the percentage of capacity used is less than 20% AND the improvement-to-land ratio is less than 50%.

Note that all calculations are based on base floor-area ratios and do not include additional square footages that might be allowed because of development and building features that qualify for FAR bonuses (residential development, bike lockers, etc.)

b. parcels outside the Central City but within 500' of a "frequent service" transit line: mapped as underutilized if they are using less than 20% of their allowed FAR building square footage (regardless of the improvement-to-land ratio). Improvement and land values are not as accurate or consistently recorded outside Portland's Central City, so they are not used in other parts of the City at this time. Frequent service transit lines are defined as bus and light rail lines that run every 15 minutes or better during weekday peak hours.

c. all other parcels: mapped as underutilized if they are using less than 10% of their allowed FAR building square footage (regardless of the improvement-to-land ratio).

The development capacity GIS model is composed of several "scripts" written in both Python and Arc Macro Language (AML). The model itself runs in ESRI's ArcGIS (Version 10.0). It is completely automated, requiring roughly four hours to process all parcels within Portland's jurisdiction. A GIS-based approach allows for all of the information that determines why things are mapped the way they are to be part of the resulting data, allowing people to better understand the decision making process. The model is not static – as the inputs to the model change, the model results can be updated, thus allowing the model to incorporate changes in zoning regulations, assumptions, etc., thus making the capacity analysis easy to update and maintain over time.

The final output of Step #3 is a GIS dataset that contains all of the parcels in the City of Portland with "attributes" identifying those that are significantly underutilizing available capacity. There are many other attributes as well, including all of the information needed to make the decisions and calculations described in Steps 1 through described above. For more information, refer to the Model Results section.

model inputs

The following GIS datasets are used by the Development Capacity Analysis GIS model. Many of these datasets are available for viewing by street address via www.PortlandMaps.com.

1) development parcels (taxlots)

GIS data description: Development parcels, right-of-way outlines and tax account numbers as represented on county tax assessor hard copy maps. Each parcel carries as an attribute the county "Property ID" for that parcel which can be used to associate the taxlot with the information in the Multnomah County Assessor's database (such as the assessed values, owner information, etc.). Selected items from the Multnomah County Assessor's file are included in the attribute table for each parcel (refer to the metadata below for a complete list of attributes).

Maintained by Portland Bureau of Transportation on contract from the City of Portland Corporate GIS. Updated on a weekly basis.

GIS Data Metadata: http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52066&Db_type=sde&City_Only=False

Primary Model Use: Parcels are the basis for the DCA model analysis (the model conducts its analysis parcel by parcel). Also used to determine the predominant building use of each lot (from Assessor data).

2) 3D building model

GIS data description: Buildings with roof and surface elevation and building height attributes. Derived from photogrammetric data, building permit information, LiDAR data, and 3D models submitted by developers. Central City buildings manually digitized. All other buildings in the City are derived from LiDAR and photogrammetric data.

Created and maintained by the City of Portland Bureau of Planning & Sustainability. Updated on a regular basis. Refer to the metadata below for more information.

GIS Data Metadata: http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52412&Db_type=sde&City_Only=False

Primary Model Use: Estimate existing building square footage.

3) multi-family housing inventory

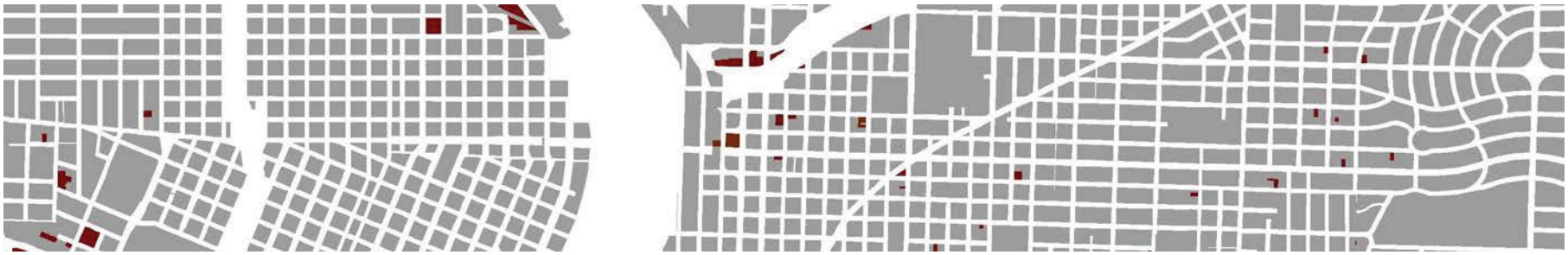
GIS data description: Inventory of multifamily housing units with the greater Portland metropolitan region. Included in the inventory are condominiums, duplexes, apartments, mobile home parks, triplexes, retirement facilities, dormitories, and townhomes that include multiple dwellings on a common taxlot. The dataset does not include any data for parcels containing only one residence.

Maintained by Metro. Refer to the metadata for more information.

GIS Data Metadata: http://rlismetadata.oregonmetro.gov/display.cfm?Meta_layer_id=2364&Db_type=rlis

Primary Model Use: Determine the number of existing multifamily units for each parcel.

4) vacant land



GIS data description: Development parcels and portions of parcels appearing unimproved on aerial photography, without regard to developability and accessibility. On partially developed parcels, only undeveloped areas 1/2 acre or larger are included. Developed and maintained over the last ten years, the vacant land dataset represents the foundation for measuring buildable lands and analyzing carrying capacity with the region. The data is derived from a rule-based examination of aerial imagery at a fixed scale. Editing is performed at a taxlot level and every attempt is made to rectify and register the data to the regional taxlot file. Data is used in measuring buildable lands and analyzing carrying capacity with the Metro region.

The inventory reflects the status of vacant land on the date the photos were flown. No conclusions regarding capability or availability for development should be made. Records are updated in the fall of each year.

Maintained by Metro. Industrial areas have been updated and refined by the Bureau of Planning & Sustainability.

GIS Data Metadata: http://rlismetadata.oregonmetro.gov/display.cfm?Meta_layer_id=196&Db_type=rlislite

Primary Model Use: Identify vacant parcels (which are all considered underutilized).

5) "likely"/"unlikely" parcels

GIS data description: The initial outputs of the Development Capacity Analysis GIS model in Portland's Central City were reviewed thoroughly by BPS staff. Based on staff knowledge, parcels that were known to have high ("likely") or low ("unlikely") development or redevelopment potential were mapped by Bureau of Planning & Sustainability staff.

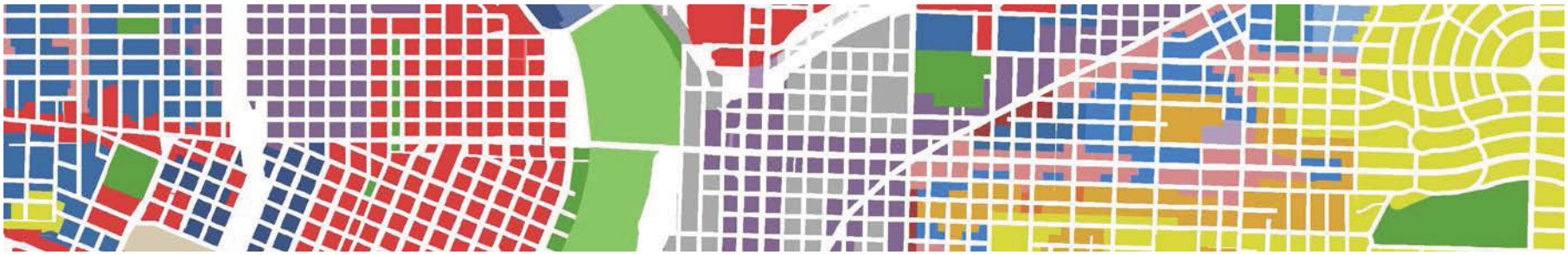
A similar review of the DCA model results is undergoing for areas of Portland outside the Central City.

GIS Data Metadata: *No metadata available. Contact the Bureau of Planning & Sustainability for more information.*

Primary Model Use: These parcels were used in two ways:

- parcels not identified by the DCA model as underutilized and "manually" flagged as having high development/redevelopment potential are all mapped as underutilized regardless of the existing or allowed development capacity;
- parcels flagged as having a very low likelihood for development or redevelopment are not included in the final map of underutilized parcels

6) zoning



GIS data description: Current zoning for the City of Portland and unincorporated portions of Multnomah County that are administered by the City. Includes zoning designations, comprehensive plan designations (which reflect the current adopted land use plan for Portland), overlay zones, as well as plan, historic, and conservation districts. Used for producing official zoning maps and for land use analysis.

Created, maintained, and updated as necessary by the Bureau of Planning & Sustainability.

GIS Data Metadata: http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52098&Db_type=sde&City_Only=False

Primary Model Use: There are several ways the DCA model uses zoning information:

- comprehensive plan designations are used to determine allowed development limits in areas where the zoning code does not specifically regulate development;
- identify parcels or portions of parcels that are constrained by open space (OS) zoning or protection overlay (p) zones;
- capacity utilization assumptions for identifying significantly underutilized parcels are based on the comprehensive plan designation.

7) zoning code maps

GIS data description: GIS data related to zoning code maps found in the Title 33: Planning and Zoning section of the City of Portland adopted Code & Charter. This includes floor-area ratio (FAR) limits and height limits on new development. These limits supersede the base zone limits where they exist.

Created, maintained, and updated as necessary by the Bureau of Planning & Sustainability.

GIS Data Metadata: *No metadata data available. Refer to the Title 33: Planning and Zoning section of the City of Portland adopted Code & Charter for more information and the complete set of maps.*

Primary Model Use: Used to determine allowed development limits in areas where the zoning code specifically regulate developments, using floor-area ratios (FAR) to calculate allowed building square footages.

8) natural resource inventory (NRI)

GIS data description: The City of Portland, Bureau of Planning, Natural Resource Inventory Update project GIS model combined riparian and wildlife habitat relative resource value. Relative resource values are determined by a GIS model that evaluates all of the areas within Portland's jurisdiction to determine if they provide significant natural resource functions. The model generates maps of riparian and wildlife habitat resources based on the presence of landscape features including streams, rivers, wetlands and other water bodies, floodplains, steep slopes, and vegetation. These features are associated with a set of riparian or wildlife habitat functions that are individually evaluated by the model.

For more information about the City of Portland Natural Resource Inventory Update project, visit the NRI Project homepage. For more information on the Natural Resource Inventory GIS model, refer to the model documentation at http://www.portlandonline.com/shared/cfm/image.cfm?id=165937.

Created, maintained, and updated as necessary by the Bureau of Planning & Sustainability.

GIS Data Metadata: *http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52823&Db_type=sde&City_Only=False*

Primary Model Use: Used to identify parcels or portions of parcels that where development is constrained by the presence of high relative value riparian or wildlife habitat resources.

9) public parks

GIS data description: Publicly-owned park dataset derived from parcels that compose the park site.

Created and maintained by the Portland Parks Bureau.

GIS Data Metadata: *http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52451&Db_type=sde&City_Only=False*

Primary Model Use: Used to identify public parks. Parks are considered constrained and are not mapped as underutilized because no commercial/residential development is allowed.

10) historic landmarks

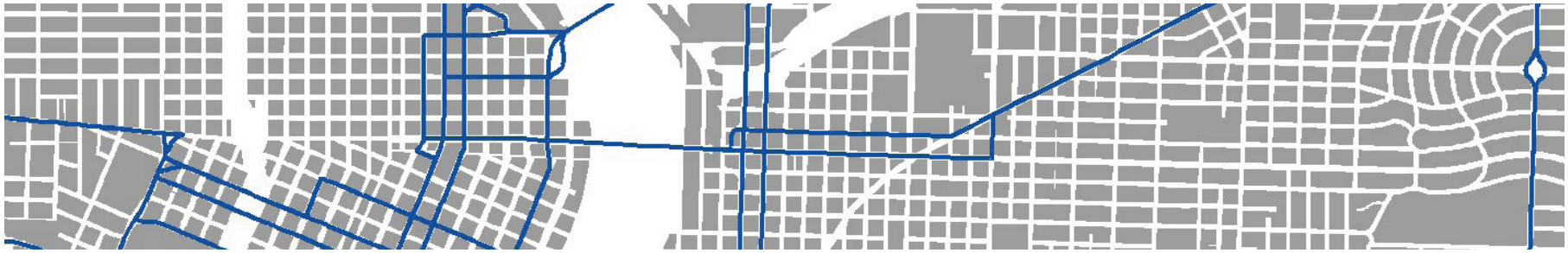
GIS data description: Locations of officially recognized historical landmarks. Includes Federal, State, and local landmarks. Point locations mapped to parcels by the Bureau of Planning & Sustainability.

Created, maintained, and updated as necessary by the Bureau of Planning & Sustainability.

GIS Data Metadata: *http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52550&Db_type=sde&City_Only=False*

Primary Model Use: Used to identify historic landmarks. Landmarks are considered constrained and are not mapped as underutilized regardless of the amount of existing/allowed capacity.

11) "frequent service" transit lines



GIS data description: "Frequent service" bus and light rail transit lines. Frequent service transit lines are defined as bus and light rail lines that run every 15 minutes or better during weekday peak hours.

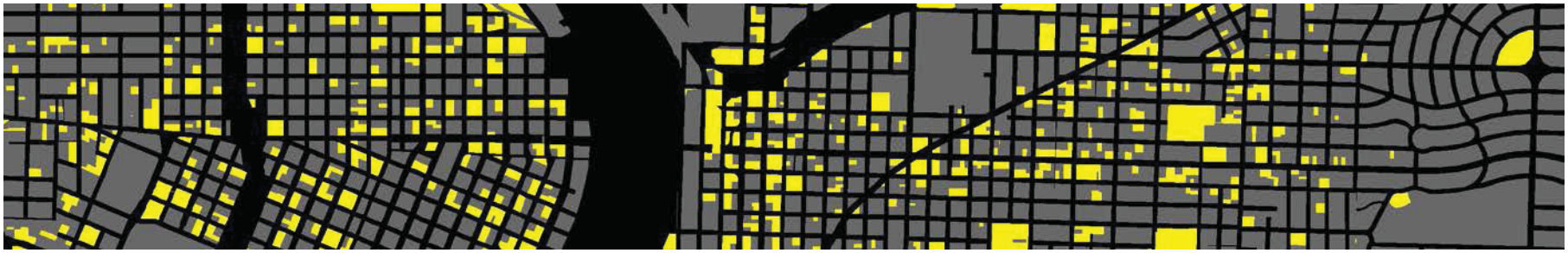
Maintained by TriMet.

GIS Data Metadata: *http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=456&Db_type=sde&City_Only=False*

Primary Model Use: To identify parcels within 500' of a frequent service transit line.

model results

development capacity analysis GIS data



GIS data description: The final output of the Development Capacity Analysis GIS model is a GIS dataset that contains all of the parcels in the City of Portland, and the Multnomah County pockets administered by the City, with "attributes" identifying those that significantly underutilizing available capacity. There are many other attributes as well, including all of the information needed to make the decisions and calculations described in the Methodology section above.

This data is updated regularly as model inputs or assumptions change. Available in shapefile format from the City of Portland Bureau of Planning & Sustainability.

GIS Data Metadata: *http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52965&Db_type=sde&City_Only=False*

project contacts

For more information about the City of Portland Development Capacity Analysis GIS model, please contact:

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