Housing Assessment Resource Tools (HART)

BC Public Lands Map Methodology

Updated July 15, 2026

The goal of the project is to transparently display and score all public land in the province for the purposes of identifying opportunities to develop non-profit, affordable housing in BC. This map is the first of its kind in Canada, developed by the Housing Assessment Resource Tools (HART) team at the University of British Columbia.

Disclaimer

The BC Public Lands Map provides information about lands currently administered by federal, provincial, municipal, and other public entities across British Columbia. These lands are situated within the traditional and ancestral territories of First Nations throughout the province, many of which remain unceded.

The identification of land as "public" reflects current administrative and legal designations and does not diminish or negate Indigenous rights, title, responsibilities, or enduring relationships to these lands. Indigenous rights and title are recognized and affirmed under Section 35 of the Constitution Act, 1982, and continue to shape relationships, governance, stewardship, and decision-making regarding lands and resources throughout British Columbia.

Identifying land as publicly administered does not mean it is available for development. Any use of this tool to inform land disposition, planning, or housing development decisions should consider potential impacts to Indigenous rights, title, and interests. Depending on the circumstances, legal obligations related to consultation and accommodation may apply.

Users are encouraged to engage with affected First Nations early and seek appropriate legal and professional advice before making decisions related to land use or development.

Identifying public land

We began by using a snapshot pulled on 18 January 2026 from ParcelMapBC spatial data to identify public land across the province. ParcelMapBC includes a field “OwnerType” that classifies parcels into Private, First Nations, Federal, Crown Provincial, Crown Agency, Local Government, Mixed Ownership, Untitled Provincial and Unclassified.

Because the BCPLM is exclusively focused on public land, we excluded Private, First Nations, Mixed Ownership and Unclassified Ownership Types. From the remaining public parcels, we removed any which intersected with the layers retrieved from the BC

Geographic Warehouse (BCGW) for Indian Reserves, Parks and Protected Areas. The remaining parcels were then grouped by Regional District (RD) for further analysis.

Step 1 Identify Public Land and Remove	
Select:	**Source:**
Public Land – Owner Types in ParcelMap	ParcelMapBC
Remove:	
Indian Reserves	BCGW Indian Reserves
BC Parks and Protected Areas	BCGW- BC Parks and Protected Areas, National Parks
National Parks	BCGW - National Parks
Analyse:	
Owner Type by RD	BCGW - Local Government Polygons

1. Removing unsuitable public parcels and identifying priority parcels

Once public parcels were identified, they had to be further distilled using BC Assessment (BCA) data pulled on 9 January 2026 to exclude unsuitable parcels like marinas, schools, and hospitals.

We conducted this separately for each of BC's 29 RDs. BCA divides the province into more than 200 jurisdictions. BCA Jurisdictions within a RD were connected to the Public Land Data using the Property Identifier (PID) number. Relevant fields from other BC Assessment spatial layers and residential and non-residential inventory tables were then joined using the Folio ID or the Roll Number.

The Actual Use code from BC Assessment was used to identify and remove Schools, Hospitals, Cemeteries, Marinas, and Utilities, and the Agricultural Land Reserves (ALR) code was used to remove ALR parcels.

We used the Land Characteristic code from the Residential Inventory table to remove parcels with unsuitable qualities, such as geological and flood risk, or parcels without road access.

Finally, we removed small parcels (less than 100m^2), long and/or thin polygons like roads and trails (high circularity), and large parcels (over 2 hectares)[1]. After processing all jurisdictions in a RD, the jurisdictions were merged into a single file for each RD.

[1] Methodologically, we made this choice because these parcels would likely need to undergo a master community planning process, which makes them unsuitable for calculating developable land in the short and medium term.

BCA Land and Improvement Value Assessments

BCA's key function is to determine the land and improvement values for all properties in the province, as these values are used to derive provincial and local government tax revenue. Land value is an estimate of the current land value based on its' size, location, development potential and condition; while improvement value is an estimate of the current value of all the buildings and infrastructure on the parcel. The many fields that comprise the BCA data are used to estimate these land and improvement values, and as a result they represent a summation of all the other information.

We calculated the ratio between improvement value and land value for each parcel as one way to understand the level of development on a given parcel: parcels with low improvement values relative to land value indicate that the land is underutilized. A parcel with an improvement value of zero indicates that the parcel is vacant.

Where there is one property per parcel (e.g. single-family dwellings) we directly used the assessed land and improvement values from BCA. In cases where multiple property titles exist on a single parcel (multi-dwelling parcels or mixed-use parcels), we summed up the BCA improvement values and land values for all properties on a parcel to determine the overall improvement and land value for that parcel. Summing all overlapping improvement and land values was an essential step to avoid mis-identifying a unique publicly-owned property as vacant or underutilized, when in fact it overlapped with many other properties in public or private ownership.

Step 2: Remove Unsuitable Parcels and Identify Priority Parcels	
Include	**Source:**
BC Assessment spatial layers & residential + non-residential inventories	BC Assessment
Exclude:	
Area: Small (<100m2)	ParcelMap BC / BC Assessment
Actual User Code: Marinas	BC Assessment
Actual User Code: Hospitals	BC Assessment
Actual User Code: Schools	BC Assessment
Actual User Code: Parks (added some by PID)	BC Assessment
Actual User Code: Cemeteries	BC Assessment
ALR Code: ALR	BC Assessment
Merge Land Character Code: Geology, Flood, Intertidal etc, Access	BC Assessment
Calculate:	
Sum Gen Gross Improvement / Sum Land Value	BC Assessment
Identify:	
Vacant (improvement value = 0)	BC Assessment
Underutilized (improvement value less than or equal to 20% of land value)	BC Assessment

2. Joining suitable parcels with other data layers to rate suitability for housing

We made use of a range of other data layers sourced from Statistics Canada, BC Data Catalogue, Native Land Digital, Housing Infrastructure and Communities Canada (HICC), the Integrated Cadastral Information Society, Geo.Ca, Natural Resources Canada, DMTI Spatial and LidarBC to create a detailed multidimensional profile for each parcel. In some cases, data processing was required before joining to the public land data. These layers and processes are discussed by general category type below.

Proximity to amenities

We used HICC's Spatial Access Mapping (SAM) products to rate proximity to employment, K-12 and post-secondary education facilities, health and childcare services, cultural and fitness centres and grocery stores, based on walking distance and distance using public transit. DBs with NULL values in the SAM data were deemed to be located within water features with zero access to amenities. Approximately 93 publicly-owned parcels were located in DBs with NULL SAM values, and were deleted. SAM does not consider proximity to pharmacies so we calculated straight-line distances from parcel boundaries to pharmacies separately using BC Data Catalogue's pharmacy spatial layer. We also calculated straight line distances from parcel boundaries to parks and transit stops.

Infrastructure

We used data sourced from the Integrated Cadastral Information Society (ICI Society) to calculate minimum straight-line distances from parcel boundaries to primary electrical wires and water mains. We estimate that approximately 2/3 of municipalities in BC share infrastructure data with ICI Society, with many municipalities providing partial or no infrastructure data. We conducted tests of means test to identify municipalities with mean distances to infrastructure well above the provincial mean, and deemed those municipalities as having no data for the respective infrastructure data. We also used the Digital Road Atlas from GeoBC to calculate minimum straight-line distance to the nearest road.

At the outset of this project, we intended to capture infrastructure *capacity* in addition to access since this information can be useful when considering development viability, as system upgrades can add a significant cost burden to a project. However, after reviewing the available data sources, we've determined that there is not a reliable data source that reports capacity consistently across jurisdictions.

We considered Canada's Core Public Infrastructure Survey (CCPI). This survey has data on the length, quality, and age of a variety of infrastructure. However, these values are aggregated at the census subdivision level, and the survey does not provide any indication

of how close to maximum capacity these infrastructure assets are, nor is there a clearly-delineated rubric to measure these assessments across jurisdictions.

Natural Features and Hazards

1. Flood risk was determined through the use of the Flood susceptibility index from Geo.ca. Flood risk in the Flood susceptibility index is determined down to areas of 30 square metres. Although the Flood susceptibility index is not recommended for street-level risk analysis, it was deemed appropriate to indicate in the BCPLM when a parcel fell within a moderate to very high flood risk area. The BC Provincial Government continues to produce updated local area flood maps, and users should refer to up-to-date local area floodplain maps to confirm flood risks for specific parcels.
2. Wildfire risk for parcels was determined using BC Wildfire PSTA Fire Threat Rating data from the BC Data Catalogue. Each parcel was assigned the highest Wildfire risk value within 200m of a parcel's centroid.
3. We also considered proximity to riparian features using DataBC's Fresh Water Atlas, deeming a parcel to be in a riparian area if any part of it fell within a 50m buffer of a freshwater feature.

Site Conditions

High resolution (1m-2m pixel) digital elevation model tiles from LidarBC and the federal government were mosaiced together and used to create a slope layer to calculate mean slope for each parcel. We overlaid point data from Environmental Remediation Sites in the BC Data Catalogue, which contains data on known and potentially contaminated properties in British Columbia, for sites that have been screened, investigated or cleaned up since data collection began.

Please note that an environment remediation flag is neither an indication that a site will, or will not, require remediation, it simply indicates that a site was flagged for remediation at some time. There is currently no reliable source of province-wide data on sites with current remediation concerns nor the extent of those concerns.

We overlaid soil data from the Soil Survey Spatial View in the BC Data Catalogue to rate soil drainage.

1. Zoning, Official Community Plans, Development Areas, Historical Sites, Dwelling Density and Recent Construction
    a. Zoning and Official Community Plan (OCP) data from ICI Society, where available, were determined for each parcel.[2]
    b. We calculated BC transit-oriented development areas as per BC's Bill 47 and Major Transit Growth Areas and Urban Centres from Metro Vancouver's open data portal.
    c. We used a Data BC Heritage features layer to identify if parcels had heritage values. To characterize the current development context of parcels, Statistics Canada "dwellings per Dissemination Block (DB)" data were used to determine dwellings per acre density for each DB. This was then used to determine maximum and median dwellings per acre density in a 1 km radius around each DB to create a measure of existing, median and maximum density in a standard neighbourhood around each parcel.
    d. We used the BCA Residential and Non-residential Inventory tables to identify parcels with buildings constructed between 2020 and 2025 to create an index of recent builds across the province and an indicator of local building activity.
    e. Finally, we overlaid spatial data from the Native Land Map from Native Land Digital (native-land.ca) to include all First Nations Territories listed in the Native Land Map which overlapped in part or in whole with every parcel in the BCPLM. Please note that this information is intended to support an expansive, high-level understanding of parcels. None of the First Nations Territory as reported in the Native Land Map has been edited.

See the following table for more information about each indicator used. Each RD public land layer was spatially joined to these indicator layers or the distance to the indicator feature (for instance transit stop, roads, pharmacies) was calculated.

[2] Some jurisdictions across the province do not have open data policies or data-sharing agreements with ICI Society, so some features and data are not possible to include in the BCPLM as a result.

Step 3: Scoring Candidates		
Proximity:	**Source:**	**Method:**
Amenities:		
Places of employment (EMPs)	HICC Spatial Access Measures (SAM)	DB Public Land centroid is within
Grocery stores (GSs)		
Health care facilities (HFs)		
Primary and secondary educational facilities (EFs) (K-12)		
Postsecondary educational facilities (PSEFs)		
Sports and recreational facilities (SRFs)		
Cultural and arts facilities (CAFs)		
Child care facilities (CCFs)		
Pharmacies	DataBC	Nearest Pharmacy point (m)
Parks	ParcelMapBC	Nearest Park (m)
Transit	Translink	Nearest Transit stop (m)
Infrastructure:		
Water Mains	ICI Society	Nearest Water main lines (m)
Electric	ICI Society	Nearest BC Hydro Primary lines (m)
Roads	DMTI	Nearest Road lines (m)
Natural Hazards:		
Flood Susceptibility Index	geo.ca - NRCan	Flood Threat
Fire Threat	DataBC	Fire Threat Class
Site Conditions:		
Prefer slope less than 5 degrees	LidarBC	Mean degree slope
minimum 100ft wide (30.5m)	ParcelMap	Largest diameter (m)
Zoning, OCP	ICIS	Public land centroid in OCP, Zone poly
Transit Orientated Areas, Major Transit Growth Areas, Urban Containment Boundary	BC Act	Public land centroid in TOA, MTGA, UC
Environmental Remediation	DataBC - Environmental Remediation Sites, Crown restoration sites	ER points in Public Land parcel
Heritage Areas	DataBC - Historic Environment	Public Land centroid in Heritage polygon
Soils	DataBC	Drainage Class
Riparian (expand into 3 input layers)	DataBC - Fresh Water Atlas	Public land centroid in Riparian polygon feature
Social:		
First Nations Territories	Native Land	Territories intersecting with Public Land Parcel
Dwelling Density	StatsCan, LGeo	Public Land centroid in DB poly
Recent Buildings (Recent Development Index RDI)	BCAssessment - Residential & Commercial Inventories	Public Land centroid in Recent Development raster

Processing data for the online map

The data are gathered into a geodatabase. In ArcGIS Pro, new fields are created to prepare the data for the end user. The resulting data is turned into two feature layers, one with polygons and one with points derived from the centroid of the parcels, for use in the online map. These two feature layers are added to an ArcGIS Web Map. Within the web map we format the fields, generate the map symbology, and format the pop-up window. The ultimate map accessed by the user is in ArcGIS Experience Builder where the filters and toggles are created.

Additional fields created:

1. **Parcel shape:** To assess whether a parcel has an irregular shape that may make it more challenging to build upon, we classify each parcel as either "Regular" or "Irregular".[3]
   a. First, we estimate the parcel's width (shortest side) based on the diameter of the largest circle that fits within the parcel and estimate the length (longer side) as the parcel's area divided by estimated width.
   b. Then, we calculate how closely the shape resembles a perfect rectangle. We know the actual area and perimeter of each parcel, so we can calculate what the area would be using our estimated width and a different estimate of length based on the actual perimeter (Implied Area = Width * [Perimeter – 2*Width]/2).
   c. Then we can divide Implied Area (assuming the shape is rectangular) by Actual Area to see how close the shape is to a perfect rectangle. If the ratio equals 1, then the parcel is a rectangle. If the ratio is less than 0.9 or greater than 1.1 then we conclude that the shape has significant deviations from a rectangle and is irregularly-shaped.
   d. We also calculate the aspect ratio of each parcel as the estimated length divided by estimated width. If the length is more than 4 times longer than the width, then we conclude it is irregularly-shaped even if it's rectangular.
2. **Access to amenities (by RD)**
   a. Most amenities from the SAM dataset are measured as a value between 0 and 1 that has been standardized across Canada so that 1 represents the dissemination block with the greatest access, and 0 means no reasonable access by a road network. We calculate the terciles for these values within each RD – if a parcel is in the uppermost tercile then it has Excellent access; if in the second tercile is has Good access; if in the first tercile is has Poor access; if the value is 0 is has No reasonable access via a road network.
      i. Grocery stores are in the SAM dataset but are measured as the number of minutes to the first nearest grocery store, as well as the third-nearest, and

[3] We only apply this assessment to parcels under 5,000 square meters since larger parcels would be less constrained by setbacks, lot coverage, and other planning codes.

the fifth-nearest. If the nearest grocery store is within 10 minutes we rated it as having Excellent access; if 10-20 minutes, Good access; if 20-30 minutes, Poor access; and if greater than 30 minutes or null values then No access.

ii. SAM data exists for walking, biking, and transit. We apply the best measure of access by walking or by public transit as the parcel's SAM value for a given amenity.

b. Access to Pharmacies, and transit stations / bus stops, are calculated as the distance in meters to the nearest amenity. We assume that the average person can walk 720 meters in 10 minutes, so we use that assumption to apply a similar categorization as with grocery stores: if distance is under 740m (approx. 10 mins walking) then Excellent access; if 720-1,440m (approx. 10-20 mins walking) then Good access; if 1,440m-2,160m then Poor access; and if distance is greater than 2,160m, No access.

3. **Recent development index (by RD)**
   a. Drawing from BCA Data, we were able to estimate spatially the number of dwellings completed in the years 2021-2025. Every entry in the 2025 Residential Inventory was allocated to spatial data parcel by the UBC Library. By summing every dwelling unit with a Year Built of 2021-2025, we mapped the location of residential completions as points in each RD.
   b. A Kernel Density (Spatial Analyst) function was applied to the point data for completions 2021-2025, to convert the points to create a spatial gradient of development.
   c. In order to make the recent development index sensitive to urban versus rural/northern contexts, where the scale of development varies significantly, we converted the nominal values for residential completions into a 5-category index for each RD: Very Low, Low, Moderate, High, or Very High.
   d. These categories for each RD are calculated using the "Natural/Jenks Breaks" classification method. Natural Breaks is a statistical data clustering method that groups similar values together by identifying natural "peaks" and "valleys" in data distribution. We applied four break points define the range of nominal completions values for each of the five categories, and parcels are assigned to a category based on the spatial index value in which their centroid is located.
4. **Housing density (units per acre) and potential housing yield (units per parcel)**
   a. Housing density is calculated as the number of Total Dwellings (from the 2021 Census) divided by the land area for every DB in British Columbia. DBs vary greatly in size, as they are set when a piece of land is surrounded by roads on all sides. As a result, some DBs are very small parcels with a single high-rise tower, and they return an unrealistically high value of units per acre, so we top-coded every DB with a maximum value of 250 units per acre. This gives us a units per acre measure of

housing density for every DB in BC. In the following sections we will refer to units per acre as values of density.

b. We calculate three values of density for each parcel based on possible scenarios, plus an override if the parcel is in a provincially designated Transit-Oriented Area (TOA):
    i. Current density: this is the density of the DB that the parcel's centroid is within.
    ii. Median neighbourhood density: this is the median density of all DBs with a centroid within a 1 km radius of the current DB's centroid. If the median density value is lower than the current density, the current density value is applied.
    iii. Highest neighbourhood density: this is the highest density that is reported for a DB with a centroid within 1 km of the current DB's centroid. For example, a DB with a value current density value of 250 units per acre will have a current, median and highest neighbourhood density of 250 units per acre.
    iv. TOA density: if the parcel is in a TOA tier, then the Highest density is calculated as the units per acre possible using the TOA-specific floor-to-surface ratio (source), and assume that 82.5% of the building space can be used for housing, and assuming that the average unit takes up 65 square meters. The max of 250 units per acre is applied here. TOA density overrides all other densities.
    v. Finally, if a density value is calculated between 116 and 139 units per acre, the density is reduced to 115 units per acre. This accounts for a "dead zone" of certain structural types not being economically feasible within this density range. This typically applies when the mode of construction has to shift from wood-frame to concrete, but the achievable density is not high enough to offset the significantly higher construction costs of the move to concrete. In BC, this typically applies to a building which has between 7 and 11 residential storeys.

c. Potential housing yield for a given parcel is calculated for each of the above three scenarios of current, median and highest neighbourhood density. The resulting numbers of units are a result of multiplying the parcel's area in acres, by the number of units per acre in each of the three development scenarios.

5. Vacant & underutilized
    a. A parcel is defined as vacant if the assessed improvement value for the parcel is zero, indicating that there are no structures present, or that the value of any structures on site are insignificant.

b. A parcel is defined as underutilized if the assessed improvement value (i.e. the value of structures on a parcel) is less than 20% of the assessed land value. This is an arbitrary threshold to indicate where there may be a significant value gap between the land and what is built on it. The value ratio of improvements to land is reported for every parcel, so that users can still see this ratio even when the improvement/land value exceeds the 20% threshold.

6. **Parcel scoring**
   a. Each parcel is given a BCPLM score out of a maximum of 100 points. The weighting of these points was validated by development consultants active in the BC non-market housing sector.
   b. Parcel scoring details are included below. The decisions around scoring and weights for various characteristics were made by the HART team with some consulting support from development consultants in BC.

Amenities (36 pts max)

Critical Amenities (None=0, Poor=2, Good=4, Excellent=6)

Field	Source	Description	Max Score
cat_emp	HICC SAM	Employment	6
Transit_cat	HART Calculation	Transit	6
cat_ef	HICC SAM	Schools	6
cat_hf	HICC SAM	Health Care	6

Normal Amenities (None=0, Poor=1, Good=2, Excellent=3)

Field	Source	Description	Max Score
cat_gs	HICC SAM	Grocery Stores	3
Pharmacy_cat	HART Calculation	Pharmacies	3
cat_srf	HICC SAM	Sports & Rec Facilities	3
cat_ccf	HICC SAM	Child Care	3

Potential Density (14 pts max) — using greater of Max_Density or TOA_Density as calculated by HART

Potential density	Score
≥200	14
140 to <200	11
25 to <140	8
<25	4

Recent Development (5 pts max) — As calculated by HART using BCA data

Value	Score
Very Low	1
Low	2
Moderate	3
High	4
Very High	5

Vacant & Underutilized (25 pts max) — Vacant, Underutilized using BCA Improvement Values

Condition	Score
Vacant = Y	25
Underutilized = Y	15
Otherwise	0

Site Characteristics (20 pts max)

Slope — MEAN (5 pts max) from LidarBC

Mean Slope	Score
<1	5
1 to <5	4
5 to <10	3
10 to <15	2
15 to <20	1
≥20	0

Flood Risk **—** Flood_Risk_Cat (5 pts max) from DataBC's Fresh Water Atlas

Value	Score
Very Low	5
Low	4
Moderate	3
High	2
Very High	1

Shape — Irregular (5 pts max) calculated by HART

Value	Score
Not "Irregular"	5
"Irregular"	0

Fire Risk — Fire_Risk (5 pts max) using BC Wildfire PSTA Fire Threat Rating data from the BC Data Catalogue

Value	Score
No Threat	5
Water	5
Low	4
Moderate	3
High	2
Extreme	1
No Data	3

Output Fields

Field Name	Description	Max Score
Scr_emp	Employment score	6
Scr_transit	Transit score	6
Scr_schools	Schools score	6
Scr_health	Health Care score	6
Scr_grocery	Grocery score	3
Scr_pharmacy	Pharmacy score	3
Scr_srf	Sports & Rec score	3
Scr_childcare	Child Care score	3
Scr_amenity	Amenity subtotal	36
Scr_density	Potential Density score	14
Scr_devcat	Recent Development score	5
Scr_vac_under	Vacant & Underutilized score	25
[no field]	Development subtotal	44
Scr_slope	Slope score	5
Scr_flood	Flood Risk score	5
Scr_shape	Shape score	5
Scr_fire	Fire Risk score	5
Scr_site	Site Characteristics subtotal	20
BCPLM_Score	Final total	100

Assembling the BCPLM online

The BCPLM is displayed online using a license from ArcGIS. This section outlines the construction of the map in the infrastructure of the ArcGIS Web Map, Experience Builder, and Storymap.

1. Establishing the underlying data for ArcGIS
    a. Once the underlying data has been processed for each RD, they are combined into a single merged layer in ArcGIS Pro with every single publicly-owned parcel as a polygon.
    b. At this point we create around 50 new fields. Many fields are simply cleaned or formatted versions of the original data to look nice in the final map. Amenity categories are calculated, density and yield estimates, as well as the parcel shape estimates.
    c. A new layer is created with the same data but with points instead of polygons in order to generate the clustering functionality when the map is zoomed out.
    d. These two layers – the polygon and the point – are uploaded to ArcGIS online as feature layers.
    e. These two feature layers are used to populate the ArcGIS Web Map. This Web Map is where the parcel symbology, and clustering when zoomed out, is determined. This is also where the pop-up box for each parcel is configured.
2. Creating Graphs within ArcGIS
    a. A chart widget was added to the Web Experience to allow users to visualize and summarise data from parcels currently displayed in the Web Experience.
    b. We included widgets to display horizontal bar graphs of the following variables from the Web Map to show changes to results when filtering using the Web Experience:
        i. Number of parcels by Owner Type
        ii. Total area of parcels in metres squared by owner type
        iii. Number of parcels which are Vacant, Underutilized, or neither Vacant nor Underutilized
        iv. Total area of parcels in metres squared by Vacant, Underutilized, or neither Vacant nor Underutilized
        v. Potential housing yield according to the three development scenarios of Current, Median, or Highest density
    c. Finally, we added a static table for all of BC showing the Total Housing Yield by Density Scenario which disaggregates potential housing units by development scenario and built form.

3. **Adding the The Business Analyst features (NOT produced by HART)**

   The Business Analyst widget in allows users to visualize key demographic, economic, and market indicators for any specific location or boundary in Canada using interactive infographics and tabular reports. The data is provided by Esri and more information can be found here: https://doc.arcgis.com/en/business-analyst/web/data.htm