

UBC Sociology Zoning Project

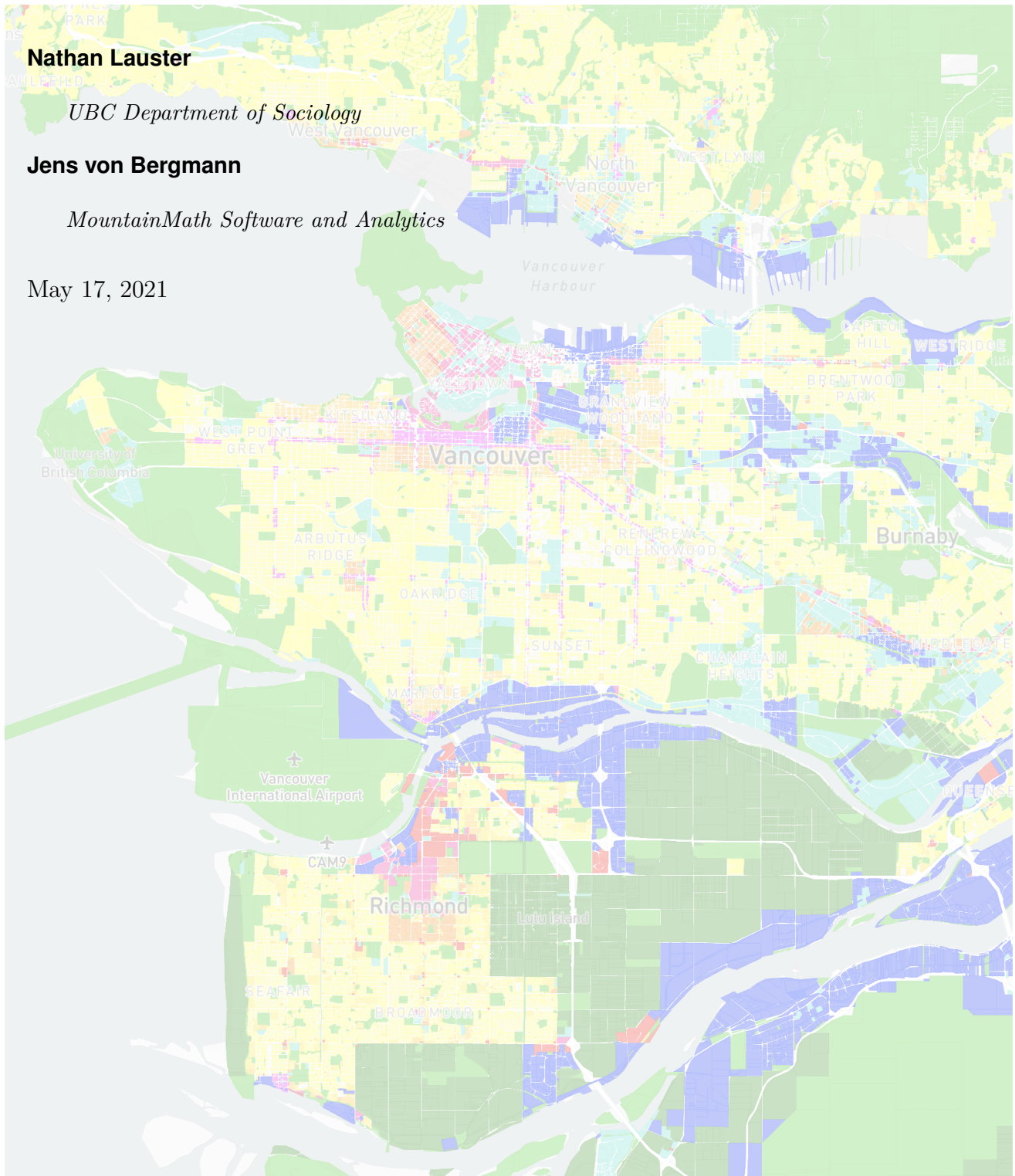
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1 UBC Sociology Zoning Project

Multiple analysts have suggested that building too little in the face of increasing demand for housing explains the bulk of the affordability challenges facing many cities around the world. This follows from basic assumptions about the dynamics of supply and demand within housing markets; that developers will supply more housing as prices rise, restoring equilibrium to the market. But various forces may prevent this developer responsiveness, or “supply elasticity”, from working, including regulations preventing or tightly constraining the construction of new housing within and surrounding cities. Lack of supply elasticity has recently been identified as a likely culprit explaining Metro Vancouver’s affordability challenges, as noted, for instance, in the [CMHC Report](#) on Price Escalation in Major Canadian Cities.

While often assumed to be at work, regulatory constraints on housing development are generally underexamined within academic research. Researchers don’t usually study them directly. In large part, this stems from the difficulty of a) extracting these constraints from the dense language of zoning and development bylaws, and b) assembling diverse zoning and development bylaws together across the many municipalities that together form integrated metropolitan housing markets. The CMHC funded [UBC Sociology Zoning Project](#) aims to assemble zoning codes for the 21+ municipalities within Metro Vancouver and make them publicly accessible, highlighting how they influence development across the region. Our goal is to enable a unified view of the regulatory framework across Metro Vancouver, with a particular focus on where and how regulation might be constraining the supply of housing. Our interactive maps of Metro Vancouver offer an overview of zoning, with the ability to zoom into individual zones and parcels.

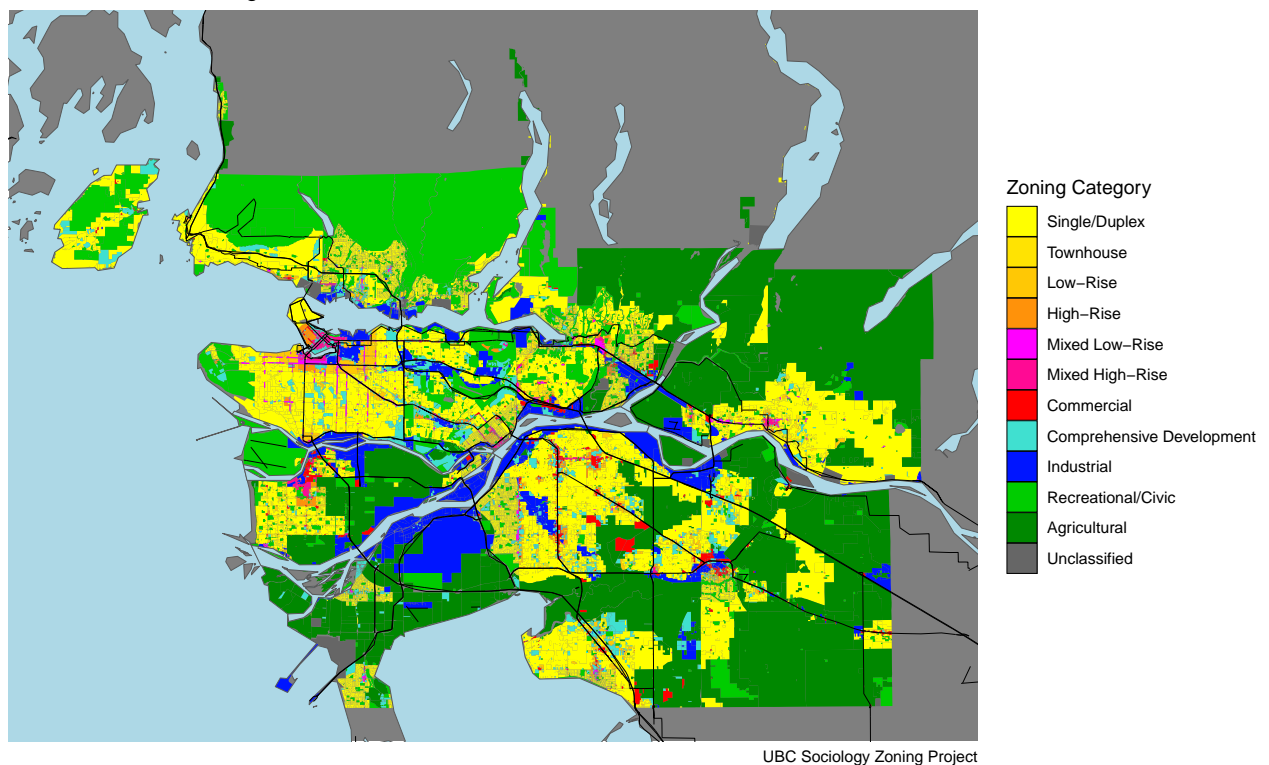
Examining the content of municipal zoning regulations in Metro Vancouver makes it very clear that they tightly limit construction of new housing, determining, for instance, the kinds of structures allowed, their internal subdivision and use for dwelling purposes, their maximum height, maximum floor space, and maximum lot coverage. In short, zoning very effectively limits how many dwellings can be legally constructed on any given plot of land. Inspections and permitting systems enforce these limitations for new construction. Developers can apply for variances from these restrictions and work their way through rezoning processes, but these add significant cost, time, and uncertainty to the construction of housing, all of which constrain developers’ ability to respond to housing demand. In older buildings, property owners can also attempt to evade zoning restrictions, subdividing their buildings to create informal and unregistered housing, but zoning and building bylaws generally require enforcement officials to shut down informal housing whenever they find it (a single neighbour’s complaint is often sufficient). In short, close examination of municipal code and process reveals the many ways that zoning bylaws serve as very effective limits on adding new housing supply to Metro Vancouver. Below we provide a more detailed overview.

2 Zoning Overview

Municipal zoning bylaws regulate how our land can be developed and used. This raises important questions:

- In what ways are zoning bylaws regulating development? (e.g. Building Type, Height, Floor Space Ratios, Setbacks)
- How do zoning bylaws differ across municipal boundaries? (Central cities, suburbs, etc.)
- How have zoning bylaws changed over time?

Metro Vancouver Zoning



At the metropolitan scale, we can see how various policies and geographic features create an effective “Green Belt” urban boundary for Metro Vancouver, including the Agricultural Land Reserve (to the south and east) and Crown Lands devoted to parks and reserves (to the north). These green barriers increasingly prevent Vancouver from further outward sprawl, and also receive broad public support. But limiting sprawl turns development pressure toward lands already developed within the Metropolitan landscape.

Here we can see how zoning protects the lowest density, most restrictive, and most expensive housing forms from change, especially those we demarcate as “single / duplex” (mostly Residential Single-Family (RS) detached). One of us has elsewhere described this area as “[The Great House Reserve](#)” to indicate its size and impact. Extending from within the City

3. METRO VANCOUVER ZONING

of Vancouver outward to the far-flung suburbs, we can see that this form of zoning encompasses the vast bulk of the Metropolitan area (in yellow), and hence poses a large barrier to adding new housing supply.

After “single / duplex” the next most common form of zoning we see at the metropolitan scale is “industrial.” Industrial zoning codes tend to keep out all residential construction entirely. As such, industrial zoning also severely constrains the addition of new housing supply. Industrial zoning is often defended on the basis of jobs protected. There are good reasons to evaluate just how well industrial zoning is protecting jobs across Metro Vancouver, given that Vancouver shares the experience of de-industrialization common to most North American cities since the middle of the twentieth century. Indeed, much of the new housing created in the City of Vancouver in recent years has been built on the formerly industrial lands surrounding False Creek. That said, many of the remaining industrial lands lie along the potential flood plains of the Fraser River. Others protect the Port. And some, as with the Burns Bog in Delta, are largely set aside as protected parkland even though they’re still officially zoned as industrial.

The prominent restrictions on residential development within “single / duplex” and “industrial” zoning forces most net new housing supply in Metro Vancouver to be squeezed into the much smaller land base of the other zones, including rare residential zones enabling townhouses and apartment buildings (orange), as well as many mixed use (pink) and comprehensive development (light blue) zones, where housing is allowed over top or alongside of commercial. These kinds of higher intensity zones occur almost entirely within and surrounding “urban centres” so designated by Metro Vancouver planning. Developer competition for the limited parcels enabling more dense forms of housing development in Metro Vancouver are generally understood to drive up land prices within these zones, adding further cost to new housing development. Ironically, these higher land prices are often cited as a reason to avoid rezoning “single / duplex” parcels, where land prices remain far cheaper on a per square foot basis.

In our [zoning map](#), we provide interactive layers for the Agricultural Land Reserve, Parks and Schools, and Metro recognized Urban Centres. These can be toggled to see how they intersect with municipal zoning. We also provide a layer for First Nations Reserve lands, which are generally (but not always) independent from municipal zoning controls. We provide an additional layer for the City of Vancouver’s “view cones” which sit over top of zoning regulations and increasingly limit the height and shape of new developments (see also shadowing rules in the City of Vancouver, which we are not able to map here).

3 Metro Vancouver Zoning

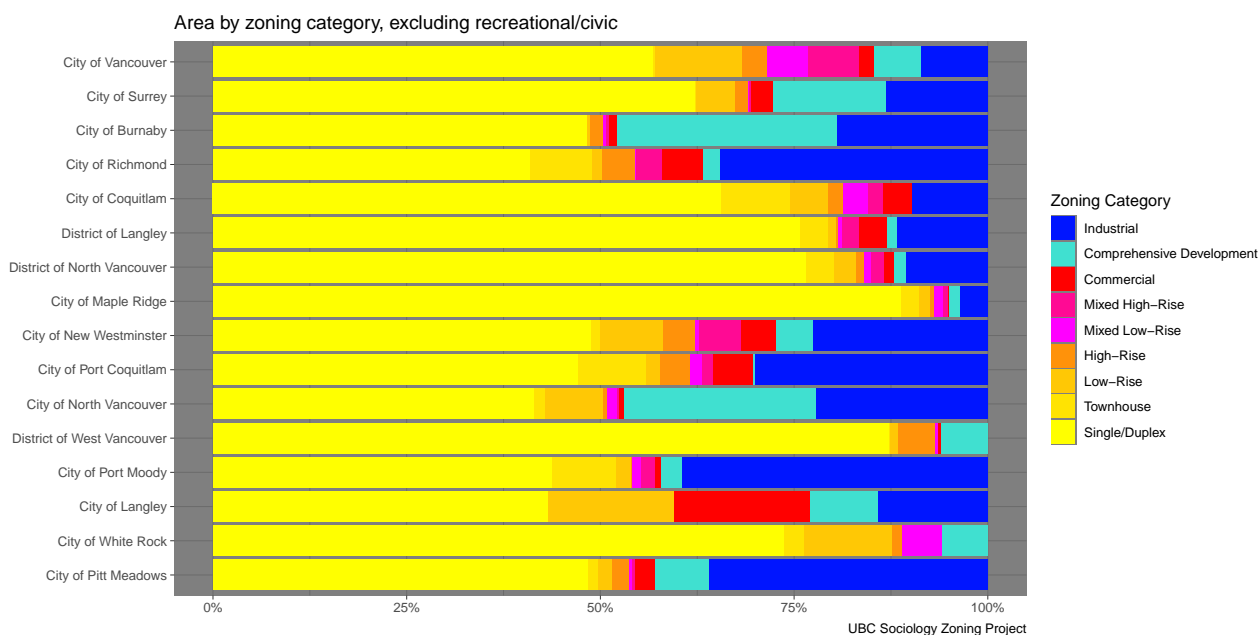
We can combine a graphic sense of the scope of various forms of zoning from our maps with more quantitative measures, as extracted from the map data. Organizing building types and uses allowed into broad zoning categories makes it easy to get high-level comparisons

4. ZONING IN SUB-AREAS

across regions. Here we can see that “single/duplex” zoning dominates every municipality in Metro Vancouver. In the majority of municipalities, including the City of Vancouver, this most restrictive form of zoning covers over half of the developable land base.

Industrial zoning is also very common across municipalities. Comprehensive Development (CD) - or spot zoning - comes next. Here it’s notable that while many higher density Comprehensive Development zones allow housing, especially within urban centres, some of the biggest CD zones, like Mountainview Cemetery in the City of Vancouver, do not.

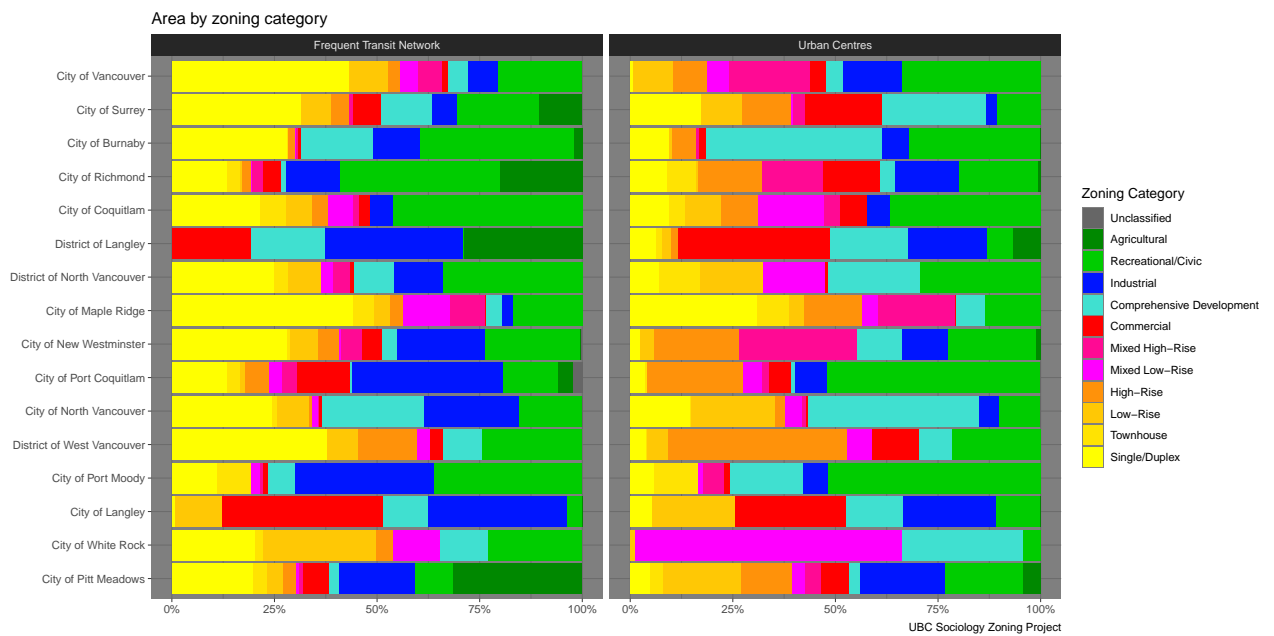
Finally we get to the relatively small portions of the land base of most municipalities zoning for apartment buildings, either standalone low-rise and high-rise (shades of orange) or mixed use (pink). An even smaller portion of the land base is devoted to zoning encouraging townhouses (light orange), providing some indication of why the famously “missing middle” might be missing in the region.



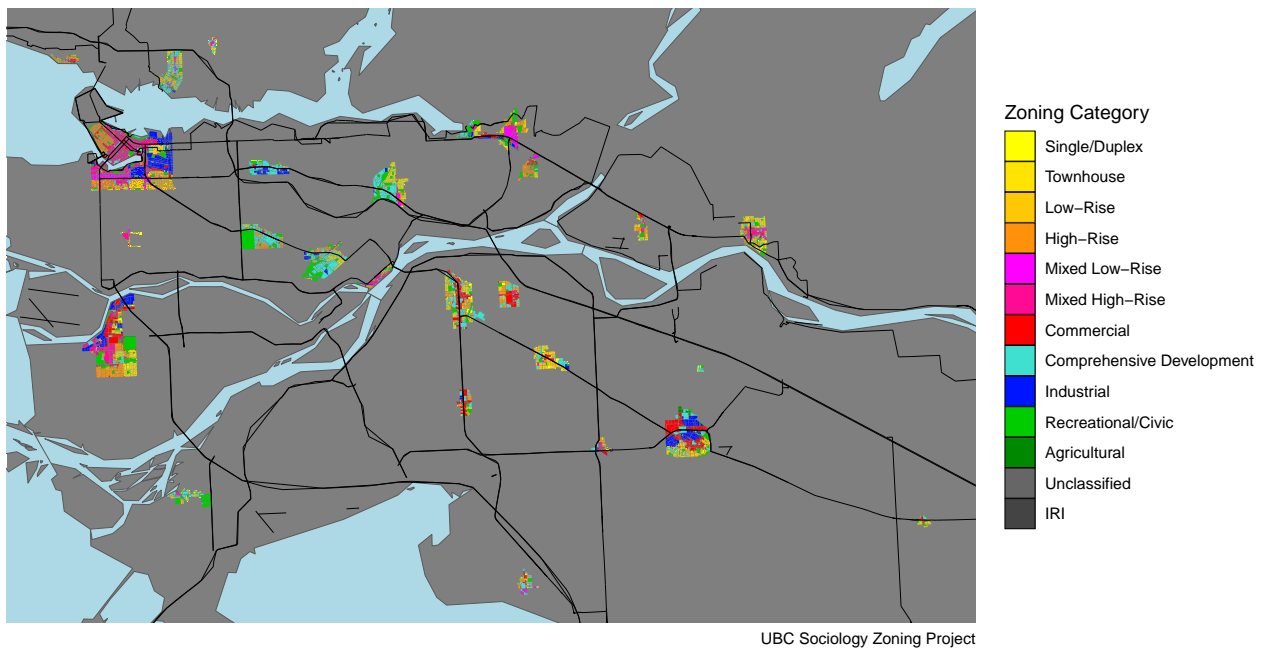
4 Zoning in sub-areas

We can also provide overviews of zoning that include non-developable land (e.g. set aside for Parks or the Agricultural Land Reserve) and that highlight specific sub-areas of interest. Here we look at zoning within the designated Urban Centres of Metro Vancouver alongside zoning within the overlapping Frequent Transit Network. Not surprisingly, we see significantly greater representation of denser, more enabling zoning categories within Urban Centres and Frequent Transit regions. But even within these regions, planned as Urban Centres and Frequent Transit hubs, we still see significant portions of the land base set aside for single-family houses and duplexes only. Indeed, we even see some agricultural zoning!

4. ZONING IN SUB-AREAS

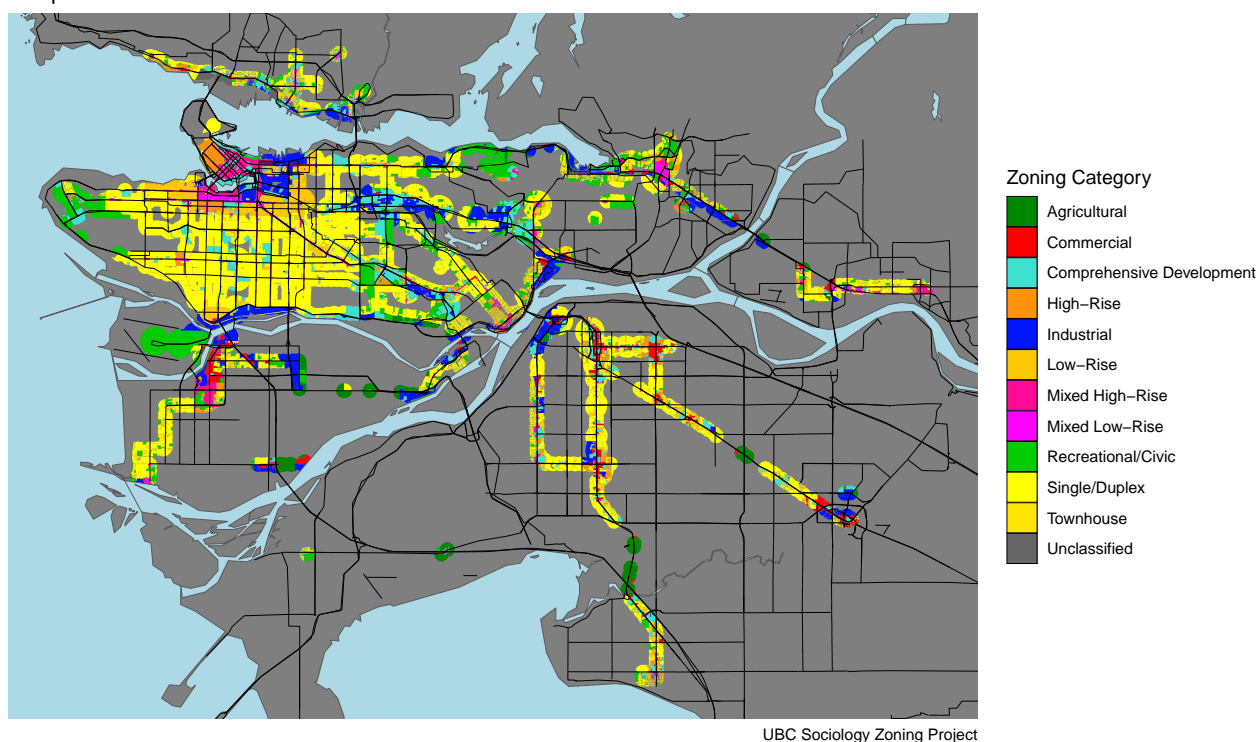


Urban Centres



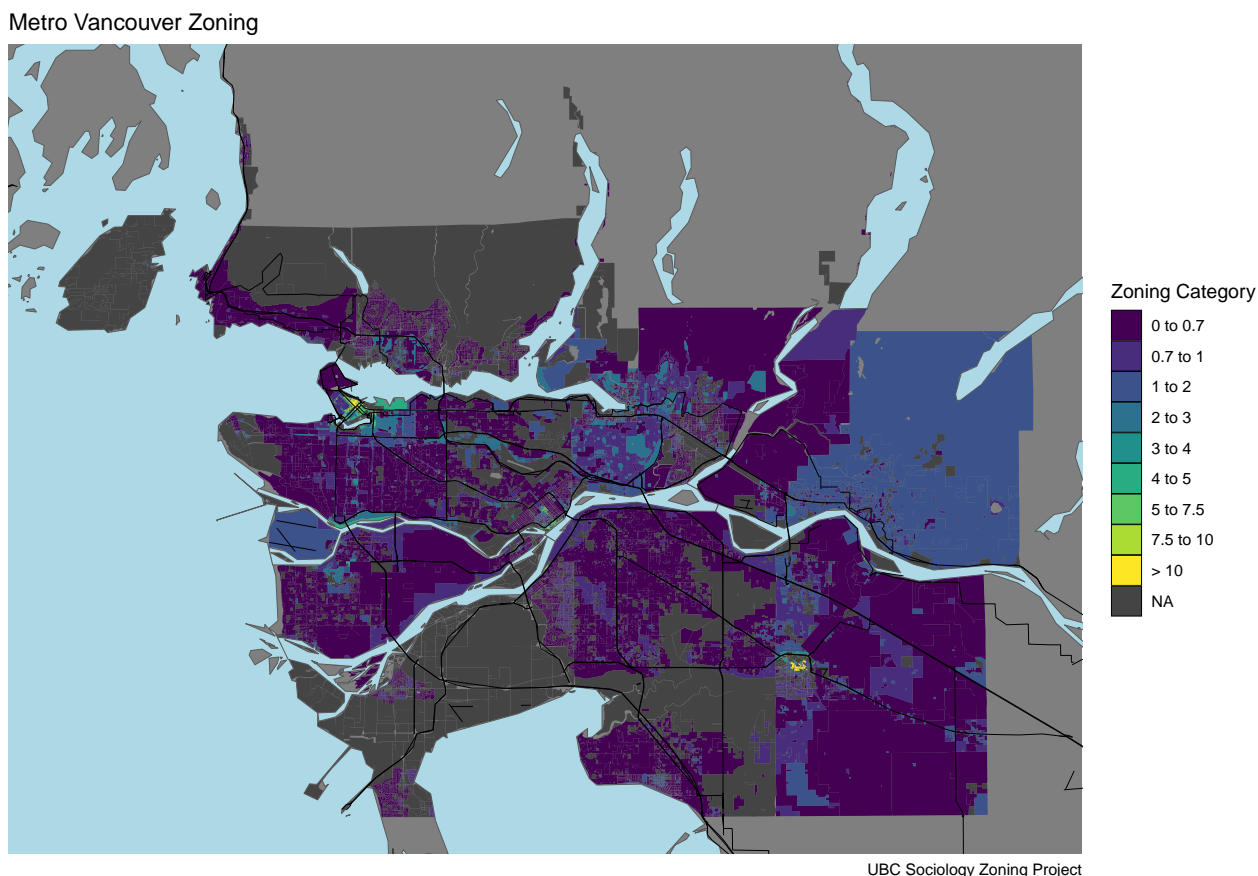
5. OTHER CONSTRAINTS

Frequent transit areas



5 Other Constraints

While zoning often directly limits the number of dwellings allowed per lot, especially in “single / duplex” RS and RT codes, a variety of other regulations attached to zoning can limit housing supply in more indirect fashion, for instance by limiting floor space, lot coverage, and height. By tracking these regulations, we’re able to compare the potential impact of various regulations (e.g. Floor Space to Lot Ratios, Maximum Heights, Minimum Setbacks, etc.) to see which are most binding on development, particularly for housing supply, comparing them across municipalities. This is still work in progress.



Here we highlight Floor Space Ratios (FSRs) extracted from zoning codes for lots where residential construction is allowed. These ratios specify how many square meters of floors space can be built per square meter of lot size. An FSR of 0.5 would enable total floor space equal to half of lot size, which might be configured into a two storey house with a sizeable yard. An FSR of 4.0 would enable total floor space equal to four times the lot size, potentially accommodating a high rise (depending upon height restrictions) or a low-rise occupying the entire lot (depending upon setback restrictions). Total constructed floor space can potentially be parceled out into a number of separate dwellings, as well as the common space tying them together.

Here darker zones reflect lower FSRs, and correspondingly lower density. Overall, FSRs across Metro Vancouver roughly follow our harmonized use zoning map, with density clustered in town centres. But there are a variety of exceptions and surprises. For instance, many multi-family (RM) residential districts have quite low FSRs, indicating that new construction could not support very many households. Often times, as we discuss more below, older buildings exceed these low FSR limits, and could not be built under the current zoning. Of note: some town centres, as with Burnaby, remain missing, since we are still integrating their Comprehensive Development zones into our codes.

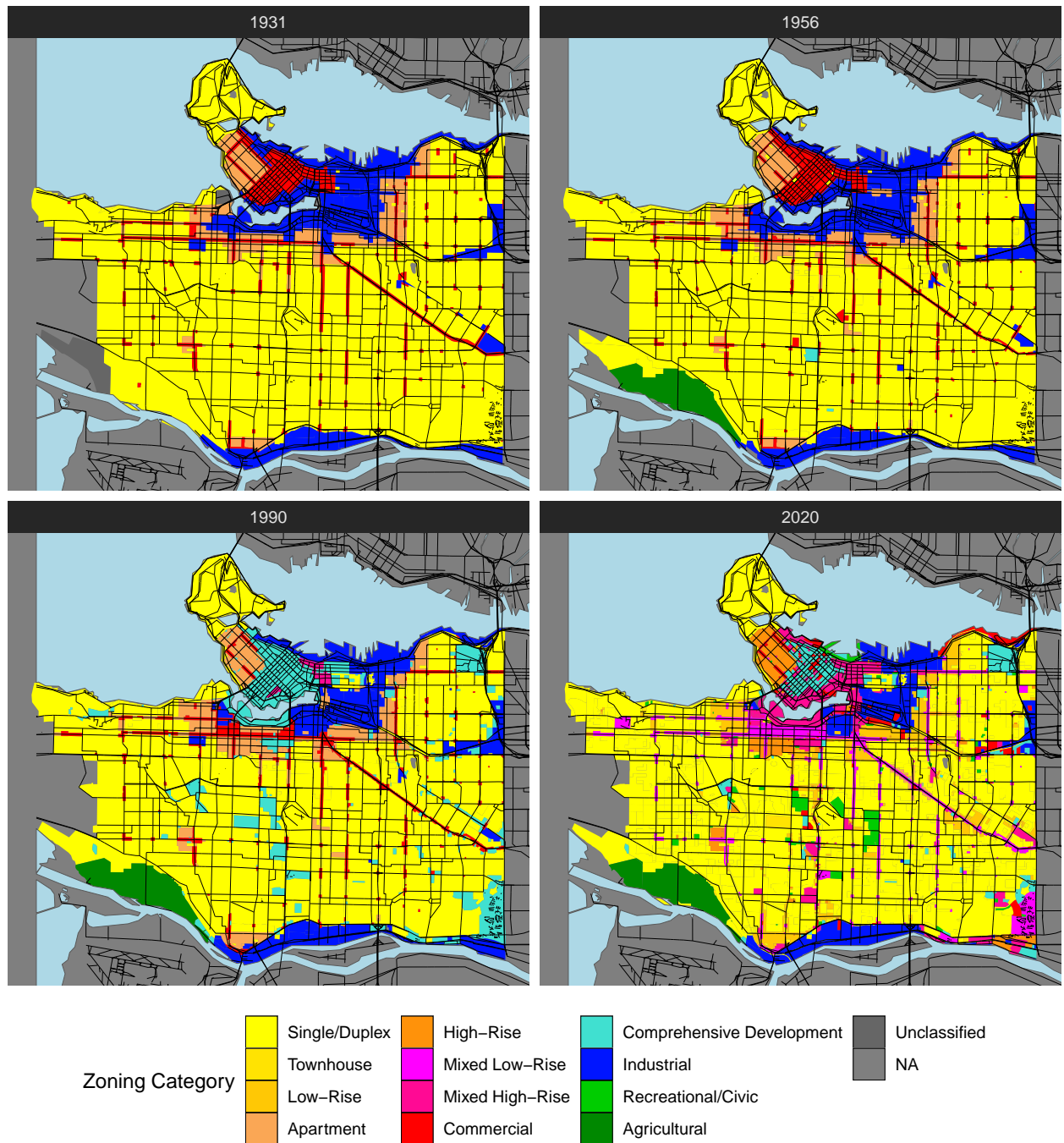
6 Historical Zoning

In addition to looking at current zoning, we're also interested in exploring changes over time, both in terms of rezoning of parcels and changing contents of bylaws. Through the project we've assembled historical maps of zoning, with a focus so far on the City of Vancouver. These [maps are available to explore via interactively](#). We're also working backward through bylaw changes to develop a more fine-grained sense of regulatory change. From the City of Vancouver we'll be successively expanding to other Metro Vancouver municipalities.

The history of zoning in Metro Vancouver is nearly a century old. Temporary "interim" zoning and development bylaws were first passed in the late 1920s in the municipalities of Vancouver and Point Grey, to be amalgamated with South Vancouver by the end of the decade. These were combined into an official zoning bylaw for the City of Vancouver that we map for 1931, mostly following the suggestions of Harland Bartholomew in his Vancouver plan. Codes were overhauled and modernized in 1956, and contemporary zoning for the City of Vancouver all refers back to and amends the consolidated 1956 bylaw. Strikingly, over the near century of its existence, the basic outline of the City of Vancouver's zoning has changed relatively little.

6. HISTORICAL ZONING

Vancouver Zoning History



UBC Sociology Zoning Project

The biggest change we see is the rise of comprehensive development and mixed-use zoning, often replacing commercial and industrial zoning in and around the downtown core. By contrast, the outline of the lowest density single / duplex zoning has remained largely the same. Observing zoning maps of the City of Vancouver over a ninety-year span provides some indication of the lack of responsiveness of zoning to dramatic changes in demand for housing. In effect, we can see only limited evidence of the rezoning we would expect if zoning

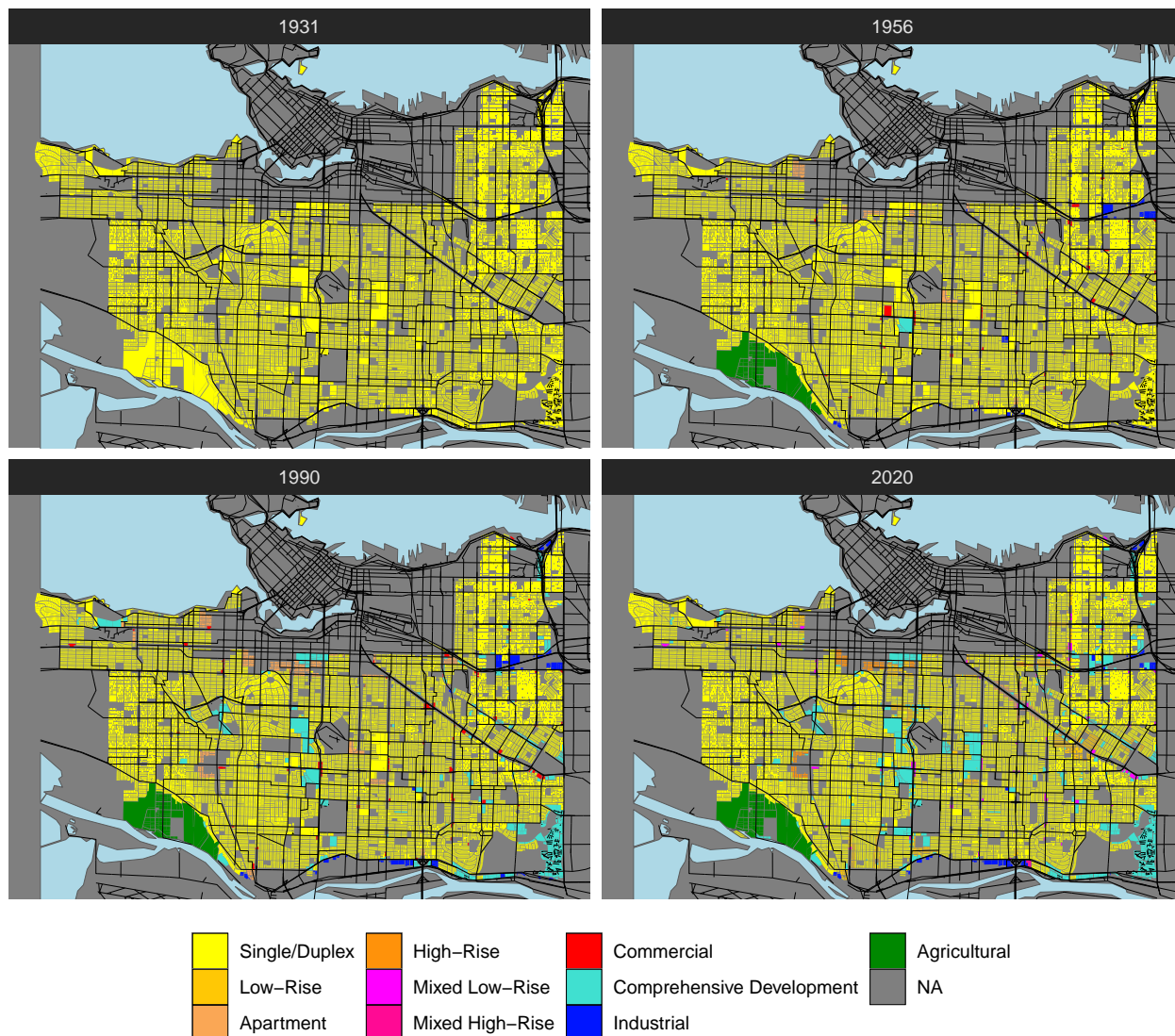
7. ZONING CHANGES IN SINGLE / DUPLEX AREAS

was responding to demand in a way to enable supply elasticity.

7 Zoning changes in single / duplex areas

For most of our maps so far, we've used zoning in its aggregated form, in the same way it shows up on zoning maps, as laid across blocks and neighbourhoods. But we can also carve out zoning on an individual lot or parcel basis. This can get complicated historically, insofar as lots can be joined or separated through time, changing year over year. But lot level analysis enables us to examine zoning and change over time in fine detail. Here we use our most recent parcel map to examine how present-day lots initially zoned “single / duplex” in 1931 (mostly RS) have changed over time.

Vancouver Zoning History



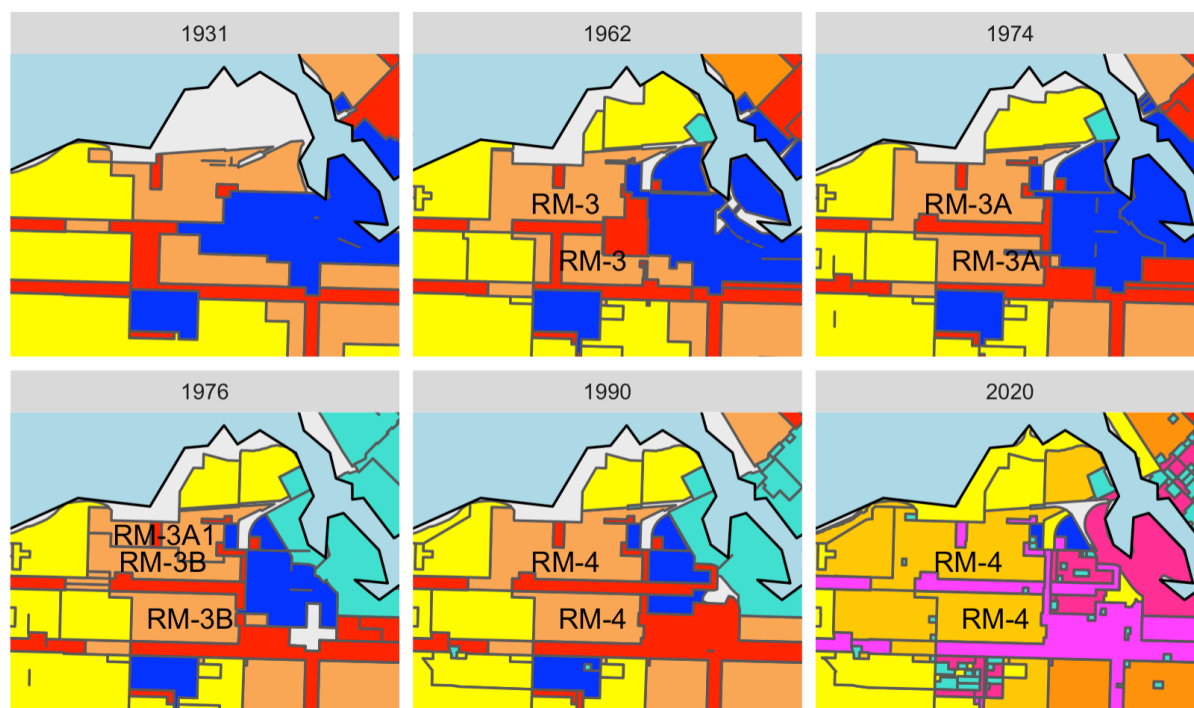
In this map we have removed lots currently used as parks or schools to focus in on Single / Duplex lots historically used for housing. For these lots, we notice very little change over time. Some limited multi-family rezoning activity has taken place along the fringes of the Single / Duplex areas and along Kingsway, with Comprehensive Development rezonings. Some larger changes, like the CD rezoning for Champlain Heights, happened in areas that were largely undeveloped and before single family homes could establish a foothold. Other large CDs simply converted grandparented uses into new zones, as with Women & Children's Hospital and Mountainview Cemetery. We also notice some pockets that got rezoned as Industrial and the Agricultural zoning in Southlands. Overall, Single / Duplex zoned lots have proven exceptionally resilient to rezoning, once again indicating a barrier in terms of achieving supply elasticity.

But zoning change doesn't always happen through rezoning. Sometimes it involves tweak to a given code, as has happened with enabling secondary suites, laneways, and duplexes across Single / Duplex (RS and RT) zones in the City of Vancouver. We can zoom in for a closer look.

8 Zoning changes in Kitsilano

Case studies are useful in describing how zoning changes (or fails to change) to accommodate growth. Does zoning respond to increased demand, enabling supply elasticity? Or does it directly work against such responses? Looking at Kitsilano provides a close-up view into some broader patterns.

Zoning changes in Kitsilano



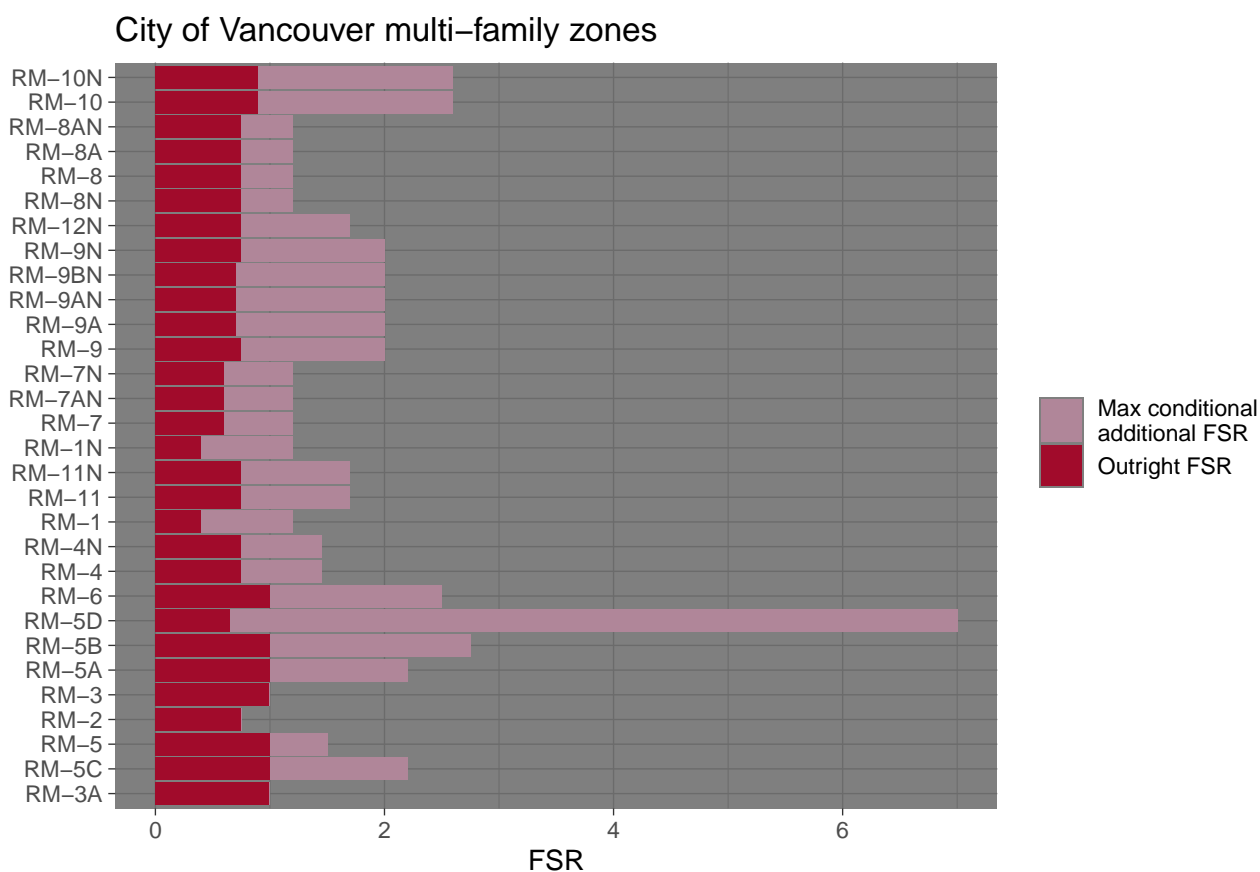
UBC Sociology Zoning Project

Sometimes neighbourhoods are **upzoned**, even without the rezoning of parcels, as was the case with Kitsilano in 1961, when maximum heights in RM-3 zones were raised from 40 to 100 ft and Floor Space Ratios (FSR), specifying total allowed square footage, made conditional. Developers responded, building the towers we still see around Vine & 2nd. Here we see supply elasticity at work, with zoning codes changing to allow developers to respond to increased demand for the amenities in the Kitsilano neighbourhood by producing more housing.

Ultimately, the arrival of towers provoked a political backlash & contributed to a change in council, and in 1974 the RM-3 zone in Kitsilano was **downzoned** to RM-3A, lowering heights to 35 feet, which also lowered the allowable FSR. FSR was further lowered, setting total buildable square footage down to 0.75 of lot size in 1976 through rezoning to RM-3A-1 and RM-3B. Eventually this zoning was consolidated by 1990 into RM-4 zoning (height 40 ft, FSR 0.75), where East Kitsilano remains today. Effectively many of the buildings now housing the current residents of East Kitsilano could not be rebuilt at their present density today. Here we see zoning working directly against supply elasticity, preventing the construction of more housing as well as the replacement of existing housing, regardless of demand.

9 Conditional zoning

Sometimes zoning rules build in a measure of flexibility, enabling, for instance, a bit of extra height or density at the discretion of the director of planning. These rules come with a varying degree of certainty, in some cases the extra height or density are automatically granted once certain criteria are met, in other cases the Director of Planning has considerable leeway to turn down extra density even if all criteria laid out in the zoning document are met. This adds some complexity to the work of developers, and may increase the time and expense with which they approach gaining approvals from municipal planning departments in hopes that relaxations to zoning will enable them to provide (and sell) more housing. This also creates a major complication to our efforts to consolidate zoning codes and make them interpretable. Conditionals show up in our Kitsilano zoning example above, and we see them extending across all of the City of Vancouver’s multi-family (RM) zones. Conditionals can significantly boost allowed density, as demonstrated below, where outright FSR is low but can often be increased at the discretion of the Director of Planning. Overall, conditional planning greatly increases the power of planner directors, but potentially creates barriers for some developers. In particular, bigger, more established developers with good connections and experience wading through legal documents may be advantaged over smaller and newer developers looking to enter the market.



UBC Sociology Zoning Project

Many of the same dynamics are likely at work in rezoning applications. Here, too, bigger

developers focused on big projects are likely advantaged, with the administrative costs, time, and hurdles less worth the effort for smaller developers and smaller-scale projects. In addition to regular zoning codes, we are also now directly documenting Comprehensive Development (CD) zoning (also called spot-zoning) across Metro Vancouver to provide a better sense of how rezoning aimed at bypassing existing zoning codes are used. We're especially interested in examining what kinds of zoning and parcels are most likely to be re-zoned into CDs, and what kinds of new uses are allowed through CDs. Many rezonings into CDs, of course, also come with direct costs in terms of Community Amenity Contributions negotiated with cities during the approval process. These can add further to the costs of new housing developments.

10 Future Plans

In future expansions, we plan to continue documenting zoning regulations across Metro Vancouver, clearly articulating how they relate to one another and operate to constrain development. As we continue to complete, check over, and consolidate our coding, our data will be made fully public and open-access in upcoming releases, enabling other researchers to incorporate zoning into their studies. We will also extend our historical work, documenting change in zoning over time. This work should provide for quasi-causal analysis of how zoning has operated upon development patterns across Metro Vancouver. With continued support through 2021, we plan to launch a working paper series on zoning changes, looking at their origins and impacts in the Metro Vancouver region, and highlighting possible policy implications. We also plan potential geographic expansions beyond the Metro Vancouver area, with discussions under way about exploring zoning in other parts of BC (e.g. The Capital Region and Kelowna) and the Toronto area in Ontario.