



Adding up the Costs of Sprawl – Not so Methodologically Simple

Eric Aderneck RPP, MPL, BCOM, DULE

To better understand the costs and revenues associated with ‘urban’ vs. ‘sprawl’ forms of residential development in Metro Vancouver, the regional district completed a study exploring municipal infrastructure capital and operating expenditures for different residential densities.



Based on a literature review and informational interviews, case studies, and financial analyses, the study explored ways to allocate servicing costs for different housing typologies, while uncovering many methodological challenges to calculate precise results.

Defining the Issue

Although urban planners are plenty familiar with the problems and benefits of urban sprawl and smart growth, attributing cost on a per unit basis by density and form is less straightforward.

The relationships between residential densities and infrastructure costs are complex. Some, but not all, services are sensitive to a city's urban form, development patterns, and residential densities. More compact development forms tend to reduce infrastructure costs, support more efficient use of resources, and encourage more sustainable forms of transportation.

As most of these infrastructure costs are initially borne by the developer and ultimately the resident, and operating costs are typically the responsibility of the municipality and ultimately taxpayers, lower infrastructure costs can help contribute to lower housing costs.

Allocating Expenditures

Allocating expenditures is not simple. Total costs by service are generally tracked and reported by municipalities for their entire jurisdiction, but it is difficult to disaggregate and assign to sub-areas and by unit types to determine actual costs by urban form. There are different catchment areas for different services with different attributes. The results can be further influenced by the attribution of costs to non-residential uses and taxpayers, such as commercial and industrial users.

In some cases, a service can have both a fixed and a variable aspect, each with different cost profiles. The cost of producing and delivering a service can be very different, with only the latter varying by its location within a municipality (e.g., a water treatment plant for the entire city, with water mains to local properties).

Local Considerations

Some municipal and related services and costs are a function of per capita demand, and others a function of location or density. Higher population municipalities - not necessarily high development densities - tend to achieve economies of scale. Beyond residential densities and types, the service delivery costs may vary by location and circumstance due to topography, geography, street pattern, and the



capacity of existing infrastructure.

The redevelopment of areas that were not planned to accommodate higher densities, such as urban infill/intensification areas, can be a challenge and more expensive to service if the needed infrastructure capacity is not present.

Costs

Most infrastructure costs are funded by developers in the form of installing on-site civil works and paying Development Cost Charges (DCCs) for off-site works. The ongoing operating costs become the responsibility of the municipality, funded by property taxes/utility fees. Capital infrastructure costs are one-time charges and, unlike variable user fees, do not influence consumption decisions in the same way as metered charges for utilities.

Based on a case study, the on-site infrastructure costs for house vs. apartment developments are approximately five times more expensive on a per capita basis (\$13,000 vs. \$2,000) and nine times more expensive on a per unit basis (\$40,000 vs. \$5,000).

Municipal DCC rates vary by unit type, and are almost always highest for single-detached houses (up to \$60,000), lowest for apartment units (approximately \$10,000), and in between for townhouses. However, when adjusted for the typical number of residents in a household, which varies by unit type, the per capita DCC rates vary much less (averaging \$10,000), indicating a greater alignment with household size rather than housing type.

While allowable under provincial legislation, most municipalities do not charge different DCC rates for different sub-areas. Municipal DCCs are typically applied at a municipal-wide rate as it is administratively simpler and provides more flexibility. This suggests that DCC rates may not be set correctly if they are the same for the entire municipality despite variances in infrastructure needs.

Revenues

While property taxes are intended to support general municipal services and are calculated based on assessed property values, a user fee, such as for utilities, is a charge for consuming a municipally-provided service. The objective in setting user fees should be the establishment of a clear link between services rendered and services paid for.

Based on a review of municipal budgets in the Metro Vancouver region, approximately one-third of expenditures (i.e., both capital and operating costs) are related to utilities/engineering services that could be impacted to some degree by land uses, development forms, and densities.



Results May Vary

More compact development forms tend to reduce infrastructure costs on a per capita basis. Yet most of the municipal budgets are for labour-intensive services and therefore do not vary much due to development densities/forms.

Research shows that, as residential density increases, municipal costs per residential unit decrease for roads, transportation, and water and sewage pipes. Stormwater management costs are more directly relevant to building site coverage/impervious surface. Community parks, recreational facilities, libraries, licensing/permitting, police, fire, and government administration costs are largely a function of population growth. Thus, there is no single, optimum level for all combined municipal services.

Findings

The following are considerations when reviewing property tax and utility fee policies, land use planning, and infrastructure investments, to support desired residential typologies:

1. Price the costs of services and charge those who benefit to encourage more efficient and sustainable urban forms.
2. Wherever reasonably possible, consider utility fees (such as metering) rather than property taxes, as they are more reflective of the actual cost of service consumption and delivery.
3. Utility fees should not be focused simply on raising revenues, but also on changing behaviours and outcomes. For increases in municipal utility fees, consider commensurate reductions in property taxes.
4. Remove regulatory and financial barriers to urban densification in appropriate locations, such as urban centres, where infrastructure investments can be best utilized. Discourage developments that are not compact forms, and that cannot be cost-efficiently serviced.
5. Recognize that achieving compact, complete communities does not necessarily require extremely high-density development. For example, moving from low-density to medium-densities in urban centres and transit corridors can provide significant efficiencies in infrastructure servicing costs.
6. Apply Development Cost Charges that vary by residential unit type/size/density, as well as sub-area geography, to better reflect the actual servicing demands and costs.
7. Some cost and revenue items are very difficult to precisely determine, allocate and track, and involve a high administrative burden and complexities. Accordingly, direct efforts towards items that matter the most with the greatest opportunity for improvement.

Closely coordinating and integrating land use and transportation planning, infrastructure servicing, and asset management in municipal decision-making can lead to improved outcomes. Understanding and communicating the costs and revenues of different land use types and residential densities is critical for advancing long-term financial sustainability and positive community building objectives.

To view the full study, please visit: <https://metrovancover.org/services/regional-planning/Documents/costs-of-providing-infrastructure-and-services-to-different-residential-densities.pdf>

Eric Aderneck RPP, MPL, BCOM, DULE, is a Senior Planner with Metro Vancouver and a planning consultant in other jurisdictions. He can be reached at eric@aderneck.ca.

Applied Planning

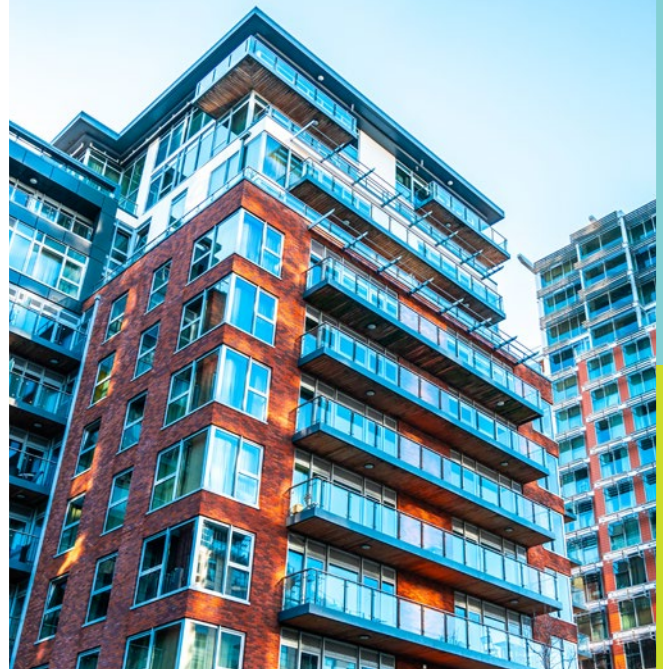
POST-DEGREE DIPLOMA: 12-MONTH,
FULL-TIME PROGRAM

This cohort-based, applied, technical program provides graduates with the skills they need to obtain an entry-level job in urban or rural planning.

Check the website for upcoming info sessions: langara.ca/applied-planning

Learn more.

Kathryn Nairne | knairne@langara.ca



snəwəyət̓ leləm̓. Langara.

Apply now for September 2024.