



COUNCIL REPORT

Report Date: April 2, 2024
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Meeting Date: April 10, 2024
[Submit comments to Council](#)

TO: Standing Committee on Policy and Strategic Priorities
FROM: General Manager, Engineering Services
SUBJECT: Residential Laneway Design & Local Improvement Procedure By-Law Updates

Recommendations

- A. THAT Council direct staff to offset the impacts of any impervious area increases caused by new laneway paving with green rainwater infrastructure as per the Rain City Strategy, subject to feasibility of site conditions and compliance with the Vancouver Building By-law.
- B. THAT Council approve, in principle, amendments to the Local Improvement Procedure By-Law No. 3614 to recover 100% of project costs from benefitting property owners for residential laneway paving projects and other Local Improvement projects for street infrastructure, generally as outlined in Appendix A;

FURTHER THAT the Director of Legal Services be instructed to bring forward for enactment the necessary amending by-law, generally in accordance with Appendix A.

Purpose and Executive Summary

The purpose of this report is to provide Council with recommendations to improve the process, design and delivery of residential laneway improvement projects. This includes an evaluation of the Country Lane (2002) demonstration pilot, responding to the “Update on the Development of a Sewage and Rainwater Management Plan for Vancouver (the “Healthy Waters Plan”)” motion approved at the February 1, 2023, Standing Committee on City Finance and Services meeting.

This report seeks Council approval to require green rainwater infrastructure (GRI) measures with new residential laneway paving projects, where viable, and to revise the City’s Local

Improvement (LI) Program such that laneway and other streets improvement projects are to be funded entirely by benefitting property owners, consistent with other LI project types such as traffic circles and lane speed humps.

Approving the recommendations will ensure that new laneway paving projects contribute to Rain City Strategy objectives, help to eliminate the significant backlog of laneway paving requests received through the program, improve delivery times for new requests, and ensure the financial sustainability of the LI Program moving forward.

Council Authority/Previous Decisions

- Local Improvement Procedure By-Law No. 3614 – governs the administration of Local Improvement projects, including the petition process and assessment of costs.
- Rain City Strategy - a 30-year plan to implement sustainable rainwater management across the City with a target to capture and clean rainwater runoff from 40% of impervious spaces using GRI in streets, public spaces, buildings, and parks. By integrating GRI alongside grey infrastructure, the City can increase the capacity of the drainage system, improve water quality in receiving water bodies, and create healthy urban ecosystems.

City Manager's Comments

The City Manager concurs with the foregoing recommendations.

Context and Background

Laneway Information and History

Country Lanes

In response to Council's Motion, staff reviewed the environmental, social and financial outcomes of the Country Lanes pilot project that was completed in 2003. At that time, the Streets Division constructed three Country Lanes to make residential laneways more sustainable and attractive (refer to Appendix B for locations). This alternative design to full-width asphalt lane paving was an attempt to reduce environmental impacts of impervious surfaces. The pilot Country Lanes have been evaluated and inspected periodically over the years. A status update was provided to Council in October 2008, and in 2016 as part of the Greenest City 2020 Action Plan. Further site inspections were conducted in 2021 and 2023 by the Green Infrastructure Implementation (GII) branch to document their condition (see Appendix B).

The Country Lanes have benefited residents with added green space and community placemaking. Initially, they had good permeability and rainfall absorption. They were also an early step in implementing new approaches to traditional paving that included GRI, a shift that eventually led to citywide adoption of GRI through the Rain City Strategy.

The original Country Lane typology has not been subsequently implemented since the 2003 pilot for several reasons. The traveling surface of the Country Lanes showed rapid deterioration, which is problematic as a key service requirement of residential laneways is to facilitate heavy

vehicle access for waste and recycling collection (Appendix B). Regarding rainwater management functionality, based on multiple observations during rain events and the inherent limitations of the design, only a fraction of our 48 mm rainfall retention target is met in a Country Lane when compared to other GRI options piloted for laneways more recently (Appendix B). In addition, they have higher construction and maintenance costs when compared to conventional paving and other GRI laneway treatments (Appendix C). Several laneway surfacing projects that include other GRI tools have been implemented since 2003, including:

- Use of porous asphalt rather than conventional asphalt (Tupper Laneway between Tupper St and Ash St north of 19th Ave.)
- Use of subsurface infiltration trenching to detain rainwater (Harriet laneway between E 28th Ave. and E 30th Ave. west of Harriet St.)
- Implementing dry wells to detain rainwater (various location in Hasting-Sunrise Neighborhood, installations in laneways in planning)

Local Improvement Program

The Local Improvement program was established in the 1960s and has been responsible for the construction of many residential streets, laneways, lights, sidewalks, curbs and lane speed humps. At the time, the LI program primarily served newer single family residential areas (and, in some cases, higher density areas) as the city grew.

In recent times, most LI projects are property owner driven with a focus on lane paving. The program is administered through a petition process where 2/3 support from benefiting property owners is required, with costs recovered wholly or in part by a special tax on the benefiting property owners.

The most common LI project types are lane paving, lane lighting, and speed humps. Sidewalks and other types of improvements, such as curb and gutter, are permitted under the LI by-law, but are not currently implemented through the LI program due to limited capital funding for the City's cost share.

Current Challenge

The City has no dedicated capital budget for laneways, rather laneway rehabilitation projects are funded out of the Local Roads program. The City has 1,050 km of local roads and 720 km of laneways. With the annual budget of \$2.5M, the City is able to rehabilitate approximately 1% of the local road network each year. Given these limited funding resources, the City does not prioritize laneway paving or renewal.

Laneway paving LI projects are currently funded 70% by benefiting property owners and 30% by the City. There is a backlog of approximately 150 requests for lane paving LI projects because of limited capital budget to cover the City's share of the cost. With current budgets, only 4-5 lane paving LI projects are completed each year, and the backlog continues to increase with most property owners waiting up to 10 years for a petition to be considered.

Background Research

Connecting with several Metro Vancouver area and other Canadian municipalities indicated that many local governments have some or all LI projects funded 100% by benefiting property owners. Additionally, no other municipality struggles with backlogs for LI implementation, due to

several factors, including municipalities having fewer laneways, fewer LI requests, 100% property owner funding or a dedicated annual property tax levy for supplementary programs.

Discussion

Lane Design Recommendations

The 2003 Country Lane pilot provided an entry point for laneway GRI in the City that enhances livability and resilience. These kinds of projects have increased the City's understanding of the benefits of resilient infrastructure and helped adopt GRI as the preferred means of rainwater management throughout the City. However, as detailed in Appendices B and C, the Country Lane typology proved to be expensive to construct and maintain, leading to challenges for durability and rainwater management function. Subsequent residential laneway projects trialed alternative tools including porous asphalt, traditional paving with infiltration trenches and dry wells, choices that deliver reliable drainage and water quality improvement services and traveling surface durability.

To increase adoption of Country Lane style features that improve permeability, mitigate overland flooding, urban runoff and climate change impacts, staff recommend that new laneway paving projects be required to offset the impacts of their impervious area increase using rainwater management tools. Asphalt laneways with infiltration trenches and dry wells achieve rainwater management targets and are more durable and cost-effective options than Country Lanes (see Appendix C for laneway typology cost comparisons).

The Vancouver Building By-law (VBBL) contains provisions pertaining to infiltration and proximity to building foundations. Engineering Services and Development, Buildings, and Licenses staff will work together to ensure implementation of laneway GRI is consistent with the provisions of the VBBL.

To achieve other desirable characteristics provided by Country Lanes such as green space and placemaking, neighbour-tended gardens could be promoted along laneway edges. It is recommended that existing City programs, such as the Green Streets Program and Boulevard Gardening Guidelines, be featured during public engagement activities to encourage beautification of laneways or other street spaces. The City has focused on greening frontage areas that are generally accessed by more people with recent projects such as the conversion of roadway to GRI at 2nd and Woodland, installation of a Blue-Green System on St. George Street, and the Permanent Plaza Upgrades program.

Local Improvement Program Changes

With current funding and program structure, Engineering can only support the City's cost share for 4-5 laneway paving projects per year, with current wait times of approximately 10 years from request to petition issuance.

To improve the long-term viability of laneway upgrades and renewal, staff recommend removing the City's cost share obligations from the Local Improvement Procedures By-law and to have all laneway paving LI projects funded 100% by benefiting property owners. This change would allow Engineering to eliminate the backlog in property owners' laneway paving requests within

3-5 years, since a lack of City funding would no longer delay LI projects from proceeding. After this 3-5 year period, wait times to access this program will be eliminated.

The Local Road capital funding previously allocated towards cost sharing for Local Improvement projects will be utilized for local road capital rehabilitation projects and Local Improvement program management.

A conventional asphalt laneway costs roughly \$200K to pave, and a typical residential laneway has around 30 abutting properties. Under the current 70% cost share, this is an average of roughly \$4,500 per property, which the benefitting property owners may pay as a one-time lump sum or amortized over 15 years (\$440/yr). If the recommendations are approved, each benefitting property owner would see an average lump sum increase of \$2,000 (\$190/yr) for conventional asphalt paving or \$3,700-\$4,600 (\$350-\$440/yr) for laneway paving that includes GRI, on their property taxes over 15 years for a typical LI lane paving project (see Appendix D for LI project cost example).

The Local Improvement Procedure By-law will also be updated so that contributions for other LI street projects, such as curb and gutter, sidewalk or local road renewal, will also be 100% funded by the benefitting property owners. This would allow the City to support implementation of a wider range of LI project types, dependent on property owner interest and sufficient petition support.

Environmental/climate implications

Vancouver continues to densify as we grow to meet our housing, community and economic needs, and this is increasing the pressures on our built and local environment. With this backdrop, every opportunity to increase our use of resilient and nature-based solutions must be considered. Residential laneway paving projects represent an opportunity to incorporate GRI so that rainwater is managed close to where it falls, thereby reducing pollutant discharges to our local waterways and improving resilience to climate impacts such as drought, urban heat and intense rainfall.

Financial Implications

Approving the recommendations eliminates the City's requirement to cost share for laneway paving and other LI streets projects. In particular, residential laneway paving projects would go from 70% to 100% funded by the benefitting property owners.

The City has internal financial capacity to finance the upfront costs of LI projects, which then are fully recovered from benefitting property owners through local improvement tax levies over a typical amortization of 15 years.

Financial implications to property owners are mentioned in the Discussion & Appendix D.

Legal Implications

The *Vancouver Charter* and the Local Improvement Procedures By-law provide a structured process for the advancement and implementation of LI projects. The provisions of the Charter also specify the methods for advancing projects, percentages of property owner approval required, methods for assessing costs to property owners, and requirements for notifying property owners.

Additional administrative language changes have been made to the Local Improvements Procedure By-Law for ease of use and to reduce redundancy.

Ability to update Local Improvement Procedure By-Law No. 3614 falls under Part XXIV of the *Vancouver Charter*.

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APPENDIX A

**DRAFT By-law to amend Local Improvement Procedure By-Law No. 3614
regarding the removal of City contributions and other miscellaneous amendments**

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**DRAFT By-law to amend
Local Improvement Procedure By-law No. 3614
regarding the removal of City contributions and other miscellaneous amendments**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This by-law amends the indicated provisions of the Local Improvement Procedure By-law No. 3614.
2. In section 1.2, Council:
 - (a) strikes out the definition of “assessed owners” in its entirety;
 - (b) in the definition of “flankage”, strikes out “section 3.10” and substitutes “section 9.3(a) or (b)”;
 - (c) in the definition of “multiple dwelling and local commercial district”, strikes out “a multiple dwelling district, a local commercial district (C-1)” and substitutes “an RM district, the FM-1 district, an RR district, the C-1 district”; and
 - (d) in the definition of “residential district”, strikes out “a limited agriculture district, a one-family dwelling district, a two-family dwelling district” and substitutes “an RA district, the R1-1 district, an RT district”.
3. Council:
 - (a) strikes out section 1.4; and
 - (b) renumbers section 1.5 as section 1.4.
4. Council strikes out section 2 in its entirety, and renumbers sections 3.1 through 3.18, 4.1 through 4.6, 5.1 through 5.7, 6.1 through 6.8, 7.1 through 7.5, 8.1 through 8.8, 9.1 through 9.21 and 10.1 through 10.18 as sections 2.1 through 2.18, 3.1 through 3.6, 4.1 through 4.7, 5.1 through 5.8, 6.1 through 6.5, 7.1 through 7.8, 8.1 through 8.21 and 9.1 through 9.18, respectively.
5. In section 2, Council:
 - (a) in the title:
 - (i) strikes out “**APPROVED ON OR AFTER ENACTMENT DATE OF THIS BY-LAW**”, and
 - (ii) strikes out “**SECTION 3**” and substitutes “**SECTION 2**”;
 - (b) strikes out section 2.1 in its entirety and substitutes the following:

“Definitions re street projects

2.1 In this Section 2, “assessed owners” means owners of assessed properties specially benefited by a project referred to in section 2.2.”;
 - (c) strikes out sections 2.2, 2.4, 2.5, 2.6, 2.7, 2.8, and 2.9 in their entirety;
 - (d) renumbers section 2.3 as section 2.2;

- (e) in section 2.2(a), adds “, including projects involving sidewalks and lanes” after “for such purpose”;
- (f) in section 2.2(b), strikes out “section 3.2(a)” and substitutes “section 2.2(a)”;
- (g) in section 2.3, strikes out “Section 9” wherever it appears, including the section title, and substitutes “Section 8”;
- (h) renumbers section 2.18 as section 2.3;
- (i) adds a new section 2.4 as follows:

“Cost of street projects

2.4 The entire cost of any street project must, except as in this or any other by-law otherwise provided, be met by special assessments according to the frontage of the real property benefited thereby and not exempt from such special assessments, except that Council may contribute out of the general funds of the city or out of the capital funds raised by the issue of general debentures, the cost of any such street project or any portion of such project as the city's share of the cost.”;

- (j) adds a new section 2.5 as follows:

“Assessments for projects involving intersections

2.5 Council deems that any project involving installation of traffic calming or diversionary infrastructure at intersections, including corner bulges or traffic circles, will specially benefit the parcels of real property abutting the streets radiating from the intersection containing the traffic calming or diversionary infrastructure improvement for a distance of one block, and the entire cost of any such project must be met by the assessed owners of those parcels.”;

- (k) renumbers sections 2.13 and 2.14 as sections 2.6 and 2.7 respectively;
- (l) in the title for section 2.7, strikes out “**Project**” and substitutes “**Projects**”;
- (m) strikes out sections 2.10 and 2.12 in their entirety;
- (n) strikes out section 2.15 in its entirety; and
- (o) strikes out “Section 3” wherever it appears, including the section titles, and substitutes “Section 2”.

6. In section 3, Council:

- (a) in the title, strikes out “**SECTION 4**” and substitutes “**SECTION 3**”;
- (b) in section 3.3:
 - (i) strikes out “undertaken in accordance with the provisions of” and substitutes “initiated under”, and
 - (ii) strikes out “Section 9” wherever it appears, including the section title, and substitutes “Section 8”;
- (c) in section 3.4,

- (i) in the title, strikes out “**projects for awnings**” and substitutes “**awning projects**”, and
- (ii) strikes out “; provided however, Council may contribute out of the general funds of the city or out of the capital funds raised by the issue of general debentures, the cost of any such awning project or any portion thereof as the city's share thereof” and substitutes “, except that Council may contribute out of the general funds of the city or out of the capital funds raised by the issue of general debentures, the cost of any such street project or any portion of such project as the city's share of the cost”;
- (d) strikes out section 3.5 in its entirety;
- (e) renumbers section 3.6 as section 3.5;
- (f) in section 3.5, strikes out “with respect to any awning project under this Section 4 accordance” and substitutes “with respect to any project under this Section 3, in accordance”; and
- (g) strikes out “Section 4” wherever it appears, including the section titles, and substitutes “Section 3”.

7. In section 4, Council:

- (a) in the title, strikes out “**SECTION 5**” and substitutes “**SECTION 4**”;
- (b) in section 4.1,
 - (i) strikes out “;” at the end of the definition of “light standard project.” and substitutes “; and”, and
 - (ii) strikes out the definition of “special light standard project” in its entirety;
- (c) in section 4.2, strikes out “special light standard project.”;
- (d) in section 4.3, strikes out “Section 9” wherever it appears, including the section title, and substitutes “Section 8”;
- (e) strikes out section 4.4 in its entirety and substitutes the following:

“Cost of street light standard projects

4.4 The entire cost of any lane lighting project, light standard project or underground wiring project must, except as in this or in any other by-law otherwise provided, be met by special assessments proportionate to the frontage of the real property benefited thereby and not exempt from such special assessments, except that Council may contribute out of the general funds of the city or out of the capital funds raised by the issue of general debentures, the cost of any such street project or any portion of such project as the city's share of the cost.”;

- (f) strikes out sections 4.5 and 4.6 in their entirety;
- (g) renumbers section 4.7 as section 4.5;
- (h) in section 4.5, in the title, strikes out “**for**” and substitutes “**of**”; and
- (i) strikes out “Section 5” wherever it appears, including the section titles, and substitutes “Section 4”.

8. In section 5, Council:
- (a) in the title, strikes out “**SECTION 6**” and substitutes “**SECTION 5**”;
 - (b) in section 5.3:
 - (i) strikes out “Section 9” wherever it appears, including the section title, and substitutes “Section 8”, and
 - (ii) strikes out “The provisions of Section 8” and substitutes “The provisions of this Section 8”;
 - (c) in section 5.4, in the title, strikes out “**projects for underground wiring**” and substitutes “**underground wiring projects**”;
 - (d) strikes out sections 5.5, 5.6, and 5.7 in their entirety;
 - (e) renumbers section 5.8 as section 5.5; and
 - (f) strikes out “Section 6” wherever it appears, including the section titles, and substitutes “Section 5”.
9. In section 6, Council:
- (a) in the title, strikes out “**SECTION 7**” and substitutes “**SECTION 6**”;
 - (b) strikes out section 6.3 in its entirety and substitutes the following:

“Application of Section 8 to collective parking projects

6.3 Except as in this Section 6 provided, the provisions of Section 8 of this By-law other than sections 8.5, 8.6, and 8.8 thereof apply to projects initiated under this Section 6.”;
 - (c) in section 6.5, strikes out “section 10.14” wherever it appears and substitutes “section 9.15”; and
 - (d) strikes out “Section 7” wherever it appears, including the section titles, and substitutes “Section 6”.
10. In section 7, Council:
- (a) in the title, strikes out “**SECTION 8**” and substitutes “**SECTION 7**”;
 - (b) in section 7.5, strikes out “section 8.4” and substitutes “section 7.4”; and
 - (c) strikes out “Section 8” wherever it appears, including the section titles, and substitutes “Section 7”.
11. In section 8, Council:
- (a) in the title, strikes out “**SECTION 9**” and substitutes “**SECTION 8**”;
 - (b) in section 8.1, strikes out “Section 8” wherever it appears and substitutes “Section 7”;
 - (c) renumbers sections 8.3 through 8.21 as sections 8.4 through 8.22, respectively;
 - (d) renumbers section 2.17 as section 8.3;
 - (e) in section 8.5:
 - (i) strikes out “section 9.13” and substitutes “section 8.15”, and

- (ii) strikes out “section 9.14” and substitutes “section 8.16”;
 - (f) renumbers sections 8.7 through 8.22 as sections 8.8 through 8.23, respectively;
 - (g) renumbers section 2.16 as section 8.7;
 - (h) in section 8.17, strikes out “section 9.14” and substitutes “section 8.16”;
 - (i) in section 8.18, strikes out “section 9.18” and substitutes “section 8.20”;
 - (j) in section 8.19, strikes out “directed by Council, pursuant to section 3.11(a), or pursuant to section 10.5, as part of the city's share of the cost of the project” and substitutes “directed by Council pursuant to section 9.3(c) or section 9.6”;
 - (k) in section 8.23:
 - (i) strikes out “section 9.14 or 9.15” and substitutes “section 8.16 or 8.17”,
 - (ii) strikes out “section 9.20” and substitutes “section 8.22”, and
 - (iii) strikes out “as provided in section 9.16” and substitutes “as provided in section 8.18”; and
 - (l) strikes out “Section 9” wherever it appears, including the section titles, and substitutes “Section 8”.
12. In section 9, Council:
- (a) in the title, strikes out “**SECTION 10**” and substitutes “**SECTION 9**”;
 - (b) renumbers sections 9.3 through 9.18 as sections 9.4 through 9.19, respectively;
 - (c) adds a new section 9.3 as follows:

“Equitable adjustments

9.3 Despite anything to the contrary in this By-law, the following provisions with respect to equitable adjustments are to apply:

- (a) for projects undertaken in accordance with the provisions of section 2 or section 4, in the case of a flankage parcel in a residential district, 75% of the cost that would otherwise be specially assessed against such parcel;
- (b) for projects undertaken in accordance with the provisions of section 2 or section 4, in the case of a flankage parcel in a higher zoned district, 25% of the cost that would otherwise be specially assessed against such parcel;
- (c) for projects undertaken in accordance with the provisions of sections 2, 3, 4 or 5, in the case of a triangular or other parcel of land of abnormal shape or situation and in the case of any area included in a right-of-way of a railway or other public utility, despite anything to the contrary in this By-law, Council may determine what variation, if any, is to be applied thereto and direct specifically the special annual assessments to be levied with respect to such parcel or area as a part of the property owners' share of the cost of any project, so that the said special annual

assessments will represent as nearly as possible an equitable and fair adjustment or special assessment thereof as compared with other parcels of real property situate within the area and subject to special assessments for the same project, which special annual assessments need not have reference to frontage measurements, area or other physical characteristics but may take into consideration the proportion of benefit to be enjoyed by the parcel to be so specifically assessed, as compared with the other parcels aforesaid. Council in directing the amount of the special annual assessments with respect to any such parcel may provide that the city contribute such proportion thereof or such amount thereof as Council may see fit; and

- (d) for projects undertaken in accordance with the provisions of sections 2, 4 or 5, in the case of a parcel having an average depth, measured perpendicular to the frontage, of less than 100 feet and an area of less than 20,000 square feet, a percentage of the costs of the project that would otherwise be specially assessed against such parcel according to the following formulae:

- (i) for parcels located in a residential district

$$\frac{75 \times 100}{100} \frac{\text{average parcel depth (in feet)}}{100}$$

- (ii) for parcels located in all other districts

$$\frac{25 \times 100}{100} \frac{\text{average parcel depth (in feet)}}{100}$$

- (d) in section 9.6, strikes out “as a part of the city’s share of the cost of the project”;
- (e) in section 9.7(d), strikes out “section 10.6” and substitutes “section 9.7”;
- (f) renumbers sections 9.10 through 9.19 as sections 9.11 through 9.20, respectively;
- (g) renumbers section 2.11 as section 9.10;
- (h) in section 9.11, strikes out “section 9.9” and substitutes “section 8.11”;
- (i) in section 9.19, strikes out “section 10.18” and substitutes “section 9.20”; and
- (j) strikes out “Section 10” wherever it appears, including the section titles, and substitutes “Section 9”.

13. Council strikes out Schedule A in its entirety.

14. This by-law is to come into force and take effect on the date of its enactment.

APPENDIX B



Country Lanes Asset Performance & Condition

A visual inspection of each asset was performed in 2016, 2021 and 2023. Below is summary of the assets' condition during the February 2023 site visits while light rain showers occurred.

- ***E 27th Ave Laneway***: Concrete driving strips and plastic grid paver (product: Geoblock) are in good condition with no weathering or cracking. However, varying grass growth with moderate to heavy sediment build-up was observed in the plastic grid paver. Standing water was observed in many sections of plastic grid paver confirming poor drainage performance.

	
<p>Overall view of E.27th Laneway showing plastic grid paver in the center with missing grass growth. Sections of the plastic grid paver missing and with compacted sediment build-up.</p>	<p>Plastic grid paver showing standing water after a light storm event due to sediment buildup. Missing grass growth.</p>

- Maple St Laneway:** Plastic grid paver (product: Golpla) is in poor condition with certain sections breaking apart and some missing leading to potholes. Gravel from the driving strips is mostly eroded. No grass growth with build-up of compacted sediment. Standing water observed in various pockets of the plastic grid paver.

	
<p>Overall view of W 5th Ave. and East of Maple St. Damaged and displaced plastic grid noted. No grass growth observed. Degraded concrete strips.</p>	<p>Damaged and displaced plastic grid paver noted leading to a pothole.</p>

- Yale St Laneway:** Concrete driving strips and plastic grid paver (product: Golpla) are in poor condition with weathering and cracking, and eroding gravel driveway connections. Limited to no grass growth with build-up of compacted sediment throughout.

	
<p>Overall view of Yale St laneway. Damaged and displaced plastic grid paver noted. No grass growth observed. Degraded concrete strips.</p>	<p>Closer view of degraded concrete wheel surface.</p>

No flooding conditions were observed or have been reported, suggesting that the existing catch basins in the **E 27th Ave** and **Yale St Laneways** are managing major storms, with Maple St Laneway runoff able to drain over the surface to W 5th Ave.

The Country Lanes do not have a routine maintenance program. However, residents provide care including mowing and watering of the grass. A maintenance plan for Country Lanes would include maintaining the grass growth through weeding, watering, mowing, and seeding on a regular basis, replacement of gravel, replacement of sand / topsoil, and replacement of damaged plastic grid paver as needed. The replacement cycle for concrete driving strips is dependent on many factors from original installation conditions to the volume of heavy vehicle use.

Locations of Country Lanes in City of Vancouver



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APPENDIX C

Cost Comparison by Laneway Type

Capital Costs

A summary of the unit costs for Country Lane, porous asphalt, standard asphalt and standard asphalt with green rainwater infrastructure (GRI) features (infiltration trench or dry well) is included in Table 1. The rates were calculated with data from past projects when available or using standard estimates. Where actual project costs were used, an inflation rate of 3% per annum was used to assess their net present value. The rates shown are subject to some error and variability.

It is important to note that this simplified comparison does not account for the added rainwater management and co-benefits such as reducing urban heat, green space and biodiversity that are provided by options other than standard conventional asphalt, and that the current design standard for City right-of-way projects is to manage the first 48 mm of rainfall.

The higher relative costs of the Country Lanes can be attributed to the additional material requirements such as concrete strips and structural grass, as well as the segmented nature of construction because the subgrade and surface for each concrete strip and structural grass strip is constructed separately.

Table 1: Laneway Options Unit Rate Comparison

LANEWAY OPTIONS	UNIT COST (\$ / m ²) FOR IMPLEMENTATION	CAPITAL COST FOR 800 m ² LANEWAY <small>Note 1</small>	% INCREASE COMPARED TO STANDARD ASPHALT
Standard Conventional Asphalt	\$244	\$ 195,000	--
Dry Well + Standard Conventional Asphalt	\$306	\$ 245,000	25%
Infiltration Trench + Standard Conventional Asphalt	\$341	\$ 273,000	40%
Porous Asphalt	\$364	\$ 291,000	50%
Country Lane	\$524	\$ 419,000	115%

Note 1: Capital costs rounded to the nearest thousand value.

Assumptions for Unit Cost

1. *Standard Conventional Asphalt:* The cost for a standard conventional asphalt laneway is based on 2024 estimates. This cost includes overhead, inspection, contingency costs, a subbase of 0.45 m, a granular base of 0.15 m, and 50 mm of asphalt as per the streets construction specifications for light duty roads in 2024.

2. *Dry Well + Standard Conventional Asphalt*: Unit rate for a Dry Well was developed using Haro St. (2021) and Hasting-Sunrise (2023) Project costs. The unit rate is approximately \$62 / m² of drainage area managed and includes inflation, overhead, design, labor, equipment, and material costs. It also assumes that the dry well will be connected to an existing catch basin with no new catch basin required. A standard conventional asphalt will be constructed on top of the infiltration trench (\$244 per m² of laneway).
3. *Infiltration Trench + Standard Conventional Asphalt*: Costs for an infiltration trench were calculated using costs from infiltration trenches built by the Green Infrastructure Branch over the past 5 years. The unit rate is approximately \$97 per m² of drainage area managed and includes inflation, overhead, design, labor, equipment, and material costs. It is assumed that a standard conventional asphalt will be constructed on top of the infiltration trench (\$244 per m² of laneway).
4. *Porous Asphalt*: The cost estimate is from the 2016 Case Study report from Streets for porous asphalt laneway between Tupper St. and Ash St. and 18th Ave and 19th Ave. The unit rate is approximately \$364 per m² and includes inflation, overhead, design, labor, equipment, and material costs.
5. *Country Lane*: The construction unit rate was established using an average of the 2003 construction costs for the three pilot laneways. Overhead costs of 20% were added to construction unit rate, which was then inflation adjusted (3%) to calculate present 2024 values.

Operation and Maintenance Costs

GRI assets such as porous asphalt, dry wells, and infiltration trenches are designed to capture, treat and detain urban run-off to provide water quality and quantity benefits. Routine maintenance of these assets is required to ensure continued optimal performance throughout their service life by maintaining their design capacity for infiltration. The typical mode of failure for systems that capture urban run-off from streets is sediment, trash and debris build-up.

Table 2 provides a breakdown of maintenance costs for each laneway option. These values are presented for a 20-year service life (present value only), with the assumption that major rehabilitation or replacement of the pavement surface will be required at the end of its service life. Annualized maintenance costs for the service life are also presented.

Routine maintenance activities and their frequencies depend on the asset type. For instance, permeable pavements require vacuum sweeping or pressure washing at a frequency of 2-4 times annually, while dry wells and infiltration trenches require flushing and catch basin cleaning at a frequency of once every 1-2 years.

For Country Lanes, it is assumed that residents would be engaged to provide maintenance to the grass through weeding, watering, mowing, and seeding, and that replacement of gravel, topsoil and plastic grid pavers will be performed by the City.

Standard conventional asphalt does not require routine maintenance unlike assets with rainwater management functionality. However, during a pavement's service life, repairs such as crack sealing, rut filling, and thin lift overlays are performed to extend its useful life. An infiltration trench or dry well with a standard conventional asphalt or porous asphalt surface will also require similar repairs during their service life.

Table 2: Laneway Options Maintenance Cost Comparison

LANEWAY OPTIONS	ANNUALIZED ROUTINE GRI MAINTENANCE COST	ANNUALIZED PAVEMENT REPAIR COSTS	TOTAL LIFECYCLE COSTS FOR A 20 YEAR SERVICE LIFE	ROUTINE MAINTENANCE ACTIVITIES
Standard Conventional Asphalt	-	\$750	\$15,000	Asphalt repairs (crack sealing, rut filling, and thin overlays)
Dry Well / Infiltration Trench	\$125	\$750	\$17,500	Catch basin and distribution pipe flushing + asphalt repairs
Porous Asphalt	\$ 600	\$750	\$27,000	Vacuum sweeping + asphalt repairs
Existing Country Lanes	\$4,300 (6 yr reset) \$2,150 (10 yr reset)	<i>GRI Maintenance costs are inclusive of pavement repair costs</i>	\$86,000 (6 yr reset) \$43,000 (10 yr reset)	Periodic (at 6 yrs or 10 yrs) reset of gravel, topsoil and plastic grid pavers + drive strip repairs

Assumptions for Lifecycle Costs

- *Standard Conventional Asphalt:* Based on Streets Ops experience, repairs (crack sealing, rut filling, and thin overlays) during a service life of 20 years.
- *Dry Well and Infiltration Trench:* Based on GI Branch operation and maintenance program experience with infiltration and rainwater tree trenches, assuming pipe flushing and CB cleaning at a frequency of once every 2 years.
- *Porous Asphalt:* Based on our GI Branch operation and maintenance program experience with permeable pavements, assuming a vacuum sweeping frequency of 4 times a year throughout its service life.
- *Country Lane:* Assuming a complete replacement or resetting of gravel, topsoil and plastic grid pavers is performed once every 6-7 years to maintain system design capacity for rainwater management function. Cost estimates were developed from 2003 construction costs estimates presented in 2016 case study. Costs for line item, 'Grasspave, Prep and Place' for Yale St. asset, which is representative of a typical 800 m² laneway were used. The cost was inflation adjusted at 3% per annum to provide present values.

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APPENDIX D

Example Laneway Paving Scenario - Local Improvement Costs to Property Owners

Average conventional lane paving project costs	\$195,000
Average number of abutting property owners	30

Average cost per property owner	Current - 70% property owner funded	Future - if LI By-Law is updated to 100% property owner funded (Increase compared to current state)		
	Asphalt	Asphalt	Dry Well + Asphalt	Infiltration Trench + Asphalt
Lump sum	\$4,500	\$6,500 (\$2,000)	\$8,200 (\$3,700)	\$9,100 (\$ 4,600)
Yearly (15-year amortization)	\$440	\$630 (\$190)	\$790 (\$350)	\$880 (\$440)
Monthly (15-year amortization)	\$35	\$50 (\$15)	\$65 (\$30)	\$75 (\$40)

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