

## APPLICATION FOR COUNCIL INNOVATION FUND

**Date of Revised Submission:** February 18, 2020

**Name of Project:** Roadside Naturalization Pilot

**Sponsoring Councillor:** Mayor Nenshi, Councillor Farrell

**Applicant Business Unit or Name of Organization:** Roads/Calgary Parks Business Units

**Affected Business Unit(s) and /or Departments:** Transportation (Roads), Community Services (Calgary Parks)

**Amount of Funds Requested:** \$450,000 (budget breakdown submitted as attachment)

**Supporting Documents Provided:** PFC Cover Report, Attachment 2 - Council Innovation Fund Terms of Reference, Attachment 3 – Project Budget and Timeline

### Project Description:

The proposed Roadside Naturalization Project explores unconventional landscaping methods on public land along roadways for potential long-term operational cost savings and to create additional value in terms of natural infrastructure, ecosystem services and enhanced biodiversity. Council and Administration had identified six sub-services for detailed analysis in Q3/Q4 2019 to determine the appropriateness of service levels and potential for cost savings, including the Boulevard Maintenance component of the Streets Service Line. Vegetation management is the primary focus of boulevard maintenance activities, with the establishment of turfgrass and regular mowing of the grass (plus associated weed and pest control, litter and debris removal, etc.) being relied upon conventionally as a cost-effective means of management. A review of alternative approaches and the evolving state of best practice in other jurisdictions and organizations has identified the potential for maintenance cost savings over the longer term and for achieving a suite of environmental benefits such as enhanced pollinator habitat and increased resilience to a changing climate, through naturalization.

Over the last 20 years in Calgary there have been limited efforts and trial projects undertaken to advance understanding of different techniques and materials for more naturalized landscaping. An expanded pilot project is being pursued to deepen our understanding, test assumptions, and assess the applicability in our climate and municipal setting of these innovative approaches prior to making larger investments of capital and any significant shifts in city-wide policy and practice. In addition to financial and environmental considerations there are community and aesthetic dimensions to be considered within a triple bottom line assessment framework. This pilot would be rigorously designed and executed to generate the data and feedback needed to inform a business case for the broader application of these unconventional landscaping methods.

The scope of the pilot project includes encompasses both field and office research components, a significant program of outreach to the public and stakeholders, and contracted landscaping treatments and associated maintenance activities on approximately 10 hectares of roadside city land. Existing turfgrass along 16<sup>th</sup> Avenue NE (east of 36<sup>th</sup> St.) is proposed for conversion to more native grasses and wildflowers in what was formerly a prairie-like setting. The location and attributes of this roadside landscaping treatment area also present opportunities for additional landscape enhancements if community outreach activities indicate they are desirable.

The proposed pilot would dedicate a portion of funding to undertake biophysical assessment of existing “low maintenance” and naturalized landscaping areas throughout the city, in addition to before/after assessments of the pilot treatment area, to document changes in the plant communities, related measures of biological success for the pilot, and its potential for broader application city-wide in the future. We further propose to include with assessments an “operational impact statement” that describes the anticipated ongoing maintenance needs and associated costs for each of the treatment types.

There are opportunities to engage and leverage the resources of public institutions in this pilot project, in designing and monitoring aspects of the landscaping treatments. Faculty and students in the University of Calgary Environmental Design Program and Olds College “Centre for Innovation” horticulture programs, and bumblebee specialists and other scientists at Mount Royal University and Southern Alberta Institute of Technology, would be well positioned as partners in taking on certain elements of the pilot as applied science and real-world learning opportunities. Documentation and communication of the scientific basis of this innovation, its costs and benefits, and its potential for application in various settings including residential (i.e. private lawns and gardens) will be key for broader engagement of Calgarians on this pilot project.

### **Project Benefits – Why is this Project Needed, and Why Now?**

There has been a growing awareness of scientific findings made public through media that a combination of various factors including urban development, large scale land uses like agriculture and forestry, pesticide use, and climate change have placed enormous pressures on biodiversity generally and also on pollinator species like bees and butterflies which are key to life processes. Credible sources like the federal agency Environment and Climate Change Canada (ECCC) indicate that time is of the essence to address the loss of ecologically rich habitats and key native species. There is in fact a recovery strategy currently being drafted by ECCC for the gypsy cuckoo bumblebee (*Bombus bohemicus*), a federally designated endangered species, which was identified during recent scientific surveys of the Canyon Meadows Drive SW “bee boulevard” area. This pilot project would be well timed and aligned with the pending bee recovery strategy.

The naturalization of roadsides has been a topic of increasing attention and discussion in Canada and internationally as the focus of several university research centres, scientific conferences, community initiatives, and even legislation. In the United States, the Fixing America’s Surface Transportation Act (“FAST Act”, Public Law 114-94, Sec. 1415) enacted in December 2015 directs the federal transportation agency to use its authorities, programs and funding to work with State departments of transportation to enhance pollinator habitat through reduced roadside mowing and integrated vegetation management practices. Across Canada there are now examples of public landscaping and vegetation management being performed to achieve multiple benefits with the use of unconventional practices, with the Toronto Area Conservation Authority’s “Meadoway” initiative being a prime example: an “underutilized” hydro corridor 16 km in length in Scarborough, Ontario, recently has been restored to high quality native meadow habitat and urban greenspace.

The Transportation Association of Canada (TAC) in August 2019 initiated a project with pooled funding contributions from TAC member cities (including Calgary), provinces, territories and Transport Canada to compile beneficial management practices in “road ecology”. The TAC project will provide information and context on a national scale for Calgary’s pilot project, and with

deliverables scheduled for October 2020 they will be timely and valuable sources of reference for benchmarking and business case development for potential scaling up of the pilot.

In December 2019, Calgary was designated by Bee City Canada as an official “Bee City”. The designation is given to municipalities and other organizations that publicly declare to protect pollinators and their habitat through coordinated and collaborative actions that promote native pollinator species. The *Resilient Calgary* strategy adopted by Council in 2019 and the earlier *Complete Street Policy and Guide* (2014) emphasize the importance of an “interconnected network of natural green and engineered green elements” including “green roadways” and “natural infrastructure” to achieve social, economic and environmental benefits outlined in those documents. Additionally:

- Calgary’s climate change resilience strategy (2018) calls for updated design guidelines for City infrastructure to promote resilience to extreme weather and chronic climate changes, including drought conditions that low maintenance landscaping may accommodate better
- Calgary is signatory to The Durban Commitment: Local Governments for Biodiversity, and our biodiversity strategic plan has as a primary target the naturalization of 20 per cent of open space in the corporate land inventory by the year 2025 to support biodiversity conservation; this pilot, with a total project area representing one-twentieth of the targeted 20 per cent, would meaningfully advance us toward that goal.

At present, there is insufficient information to proceed with changes in city-wide policy and procedure, or to scale up our habitat restoration efforts to achieve the 20 per cent target. Key uncertainties include but are not limited to:

- the effort and cost for ongoing weed control (to meet environmental regulatory requirements and obligations) in absence of regular mowing;
- ability of the market to supply the amount and type of native seed and plant stock needed, at scale; and
- public acceptance of the different visual aesthetic of unconventional landscaping.

Council and Administration are focused on service efficiency and cost-effectiveness, and to that end boulevard maintenance was one of six sub-service areas examined in detail in late 2019. While potential operational cost savings have been attributed to “low maintenance” landscaping, as are a myriad of environmental benefits, in the short-term at least we do not anticipate direct, immediate economic benefits from this investment of innovation funds. However, a well-run city that manages its assets and resources with a long-term perspective is well advised to explore emerging alternatives to the status quo using a triple bottom line lens on value creation. Interim reporting in Years 1 and 2 of the three-year pilot project would provide valuable information in time for the next service planning and budget cycle to inform a business case on how these benefits could be realized and provide the basis for a longer-term estimate on the financial impacts of naturalization work across the City’s land holdings.

## Project Partners

- **Service providers:** Landscape architects, landscape construction firms, and specialist environmental consultants can be retained as required through existing standing offers (RFSO) and/or competitive fee proposals (RFP) for services in support of City internal staff and resources for planning, design and construction.
- **Public entities:** Local academic institutions like University of Calgary, Mount Royal University, SAIT, and Olds College are well positioned to provide additional resources and expertise for landscaping design and biological monitoring components of the project.
- **City Business Units:** Transportation will continue to work closely with Calgary Parks (Urban Conservation, IPM and Urban Forestry divisions), Law, and Supply to identify and address potential risks and opportunities, and utilize the expertise available, in the planning and execution of this pilot project.

## Project Timeline

The pilot project will be completed by June 2023. Interim reporting in Years 1 and 2 of the three-year pilot project would provide valuable information in time for the next service planning and budget cycle to inform a business case on how these benefits could be realized and provide the basis for a longer-term estimate on the financial impacts of naturalization work across the City's land holdings. Attached for reference is the project timeline overview.

## Project Budget

The total budget for the project will not exceed \$450,000. Attached for reference is a breakdown of the preliminary budget developed based on approximate dimensions of the treatment areas and anticipated costs. A final budget will be prepared following project chartering and initial planning and design work.

## How does this Project meet the Criteria of the Fund as set out in the Terms of Reference?

The proposed expanded application in Calgary of an emerging area of unconventional landscaping practice will throw light on practical and operational aspects of the practice to determine its potential for improved service delivery and cost-effectiveness, considering overall value creation for the community and for the environmental well-being of Calgary. The naturalized landscaping and habitat restoration activities and outcomes that are central to this pilot project are aligned with environment-related policy aims and practices outlined in the Municipal Development Plan, Calgary Transportation Plan, Biodiversity Strategic Plan, Climate Resilience Strategy, and Resilient Calgary Strategy adopted by Council.

This project supports the following Council Priorities:

1. *A prosperous city:*  
Exploring the cost-effectiveness of naturalized landscaping with the aim of minimizing maintenance costs and maximizing environmental benefits over the long-term.
2. *Inspiring neighbourhoods:*  
The pilot is proposed for skeletal and arterial (i.e. major) roadways that connect communities, using landscaping approaches that are applicable also within

neighbourhoods along residential roads and in parks, and depending on the design they may add colour, distinctiveness, and opportunity for community engagement.

3. *A city that moves:*

Landscaping design and maintenance will address traffic safety/visibility concerns.

4. *A healthy and green city:*

Several environmental benefits ascribed to roadside naturalization include: increased biodiversity associated with native species; enhanced habitat for pollinators and birds; interception of storm water runoff; carbon sequestration by shrub and tree species; and resilience to drought conditions and climate change.

5. *A well-run city:*

By partnering with public institutions and private industry to explore innovative approaches to landscaping, The City will be leveraging opportunities to cost share, gain access to additional professional expertise and networks, and inform the development of business plans and best practices for habitat restoration of current open spaces and for new development alike.

## **What does Success look Like and How will it be Measured?**

The project will be a success if:

1. The naturalized landscaping treatments and related assessments and engagement can be completed as planned within the constraints of available budget and resources;
2. Preliminary results of biological monitoring indicate appropriate rates and extents of desired vegetation establishment as an initial return on investment;
3. Calgarians have had more opportunity to deepen their understanding of vegetation management, native species, biodiversity, and ecological processes in Calgary's open spaces including roadsides (beyond natural area parks) as a result of this project; and
4. The full costs and methods deployed in the pilot project are carefully tracked and documented to form the evidentiary basis for future business cases for capital investments in boulevard naturalization and for potential changes in practices and specifications for new development city-wide.

Economic measures of success, with respect to potential future long-term operational cost savings in as a financial return on investment may not be measurable in the three-year timeframe. However, one valuable insight to be gained from this pilot project would be how the market (i.e. landscape construction firms) price the unconventional landscaping treatments and materials. Other key information needed to validate assumptions around the effort and costs required for ongoing control of regulated weeds and maintenance for this type of naturalized landscaping will only become available over several years, as plant communities establish and evolve subject to annual variations in local climate (e.g. drought conditions) and potential disturbances (e.g. utility work in the right-of-way). Accordingly, an additional successful outcome of this project would be for partnerships to be established with academic institutions that lead to ongoing monitoring of naturalized landscapes and ecosystem processes over time, beyond the three-year timeframe of the pilot, to complement or expand on any monitoring work undertaken by The City.

The biophysical assessment component of this project, being scoped to include assessment of existing “low maintenance” areas throughout the city, will be valuable in providing some historical context and reference information beyond the two-year project timeline. This retrospective view will contribute to project success by providing insight to actual maintenance and weed control effort (relative to mowed turfgrass) over time, and by providing visual reference examples when engaging the public and gauging levels of acceptance of the more natural looking roadsides.

In relation to key indicators of success for this project, there are two related metrics already established through strategic plans and policy:

- The MDP/CTP Core Indicators for Land Use and Mobility and also the One Calgary budget include increases in the percentage of urban forest tree canopy; note that a project of this magnitude will not result in percentage-point increases in tree canopy, although naturalization at scale city-wide in the future would make meaningful contributions.
- The Biodiversity Strategic Plan established a target of 20 per cent naturalization of open space (832 ha) in the corporate land holdings by 2025, and Calgary Parks indicate that currently The City has restored approximately 6 per cent of open space; the successful completion of this pilot project would add another 1 per cent and may help the business case for further naturalization.

Success will be measured and reported back to PFC by Q4 2022 with the following key indicators:

Measure	Target
Financial: Improved business case information	100% of costs tracked
Ecological: Per cent increase in naturalized open space city-wide	1%
Social: Number of Calgarians engaged in the pilot subject matter	Increased understanding

### Project Alignment with Current Policies and Plans

The proposed project aligns with and will help to advance the implementation of several key city-wide policies, plans and procedures including but not limited to the following.

#### Calgary Transportation Plan (2009):

1. Improve the air quality on and around mobility corridors by increasing vegetation, decreasing impervious surfaces, and supporting the use of renewable energy and other techniques to mitigate climate change (Policy 3.12.b)
2. Preserve and enhance biodiversity to support the natural environment in and around mobility corridors (Policy 3.12.c)
3. All new and retrofit road and street designs should incorporate green infrastructure strategies to contribute to the environmental health and visual aesthetics of the urban fabric (Policy 3.7.o)
4. Native vegetation and a layered tree canopy structure should be incorporated within corridors to reduce the urban heat island effect and improve air quality (Policy 3.7.q)

#### Municipal Development Plan (2009):

1. All land use and transportation planning and development should seek to conserve and protect ecosystems by: (i) recognizing the interconnectedness of air, land, water, climate, ecosystems, habitat and people; ... (v) establishing, protecting and restoring native habitat and areas of biodiversity locally and regionally; ... (ix) promoting innovative technologies and processes to achieve environmental goals (Policy 2.6.a)
2. Land use planning and development, urban design and transportation planning processes should incorporate the principles of green infrastructure, which seek to: ... (iii) mimic nature through engineered green systems to reduce the impact on the ecosystem; and (iv) improve the aesthetic (visual) quality and sense of place of all communities and landscapes (Policy 2.6.1.a)
3. Create an interconnected open space system within and between watersheds to ensure that the ecological integrity of open spaces and parks are recognized and protected as the most critical element of Calgary's green infrastructure (Policy 2.6.4.f)
4. Manage natural areas and open spaces [i.e. includes public land set back from roadsides] primarily to conserve and promote native biodiversity (Policy 2.6.4.n).

#### Our BiodiverCity: Calgary's 10-year Biodiversity Strategic Plan (2015):

1. Restore 20 per cent of current open space to support the conservation of biodiversity
2. Evaluate landscapes in Calgary and set targets for conservation measures to identify, protect and manage ecological cores and corridors [e.g. includes naturalized open space]
3. Identify invasive species in open space and complete strategies for their management.

#### Climate Resilience Strategy and Action Plans (2018):

1. Update design guidelines for City infrastructure to ensure resilience to extreme weather events and chronic climate changes.
2. Include, evaluate and adapt land management practices, including vegetation, to improve resilience of Calgary's landscapes, sequester carbon, and improve the maintenance and management of these landscapes.
3. Continue education both within and outside The City, on the benefits of natural infrastructure and the resilience of natural landscapes and changes in land management.