CLIMATE CHANGE ADAPTATION PLAN FOR THE MONTRÉAL URBAN AGGLOMERATION 2015-2020

ADAPTATION MEASURES

Montréal

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ADAPTATION MEASURES

INTRODUCTION TO THE BRIEFS

The briefs that follow each introduce one of 24 adaptation measures selected for this first Climate Change Adaptation Plan for the Montréal Urban Agglomeration. For each hazard, we selected three to six key measures, as presented in the table below.

 HIGHER AVERAGE TEMPERATURES	– Protect biodiversity – Increase infrastructures' resilience to the freeze-thaw cycle – Adapt the slate of winter recreational activities and maintenance operations – Broaden the slate of summer recreational activities and maintenance operations – Control undesirable plant species
 HEAVY RAINFALLS	– Harvest rainwater – Increase infrastructures' and buildings' resilience to runoff water – Minimize sealed surfaces – Ensure the capacity of stormwater and combined sewer systems – Increase and preserve tree and plant cover – Develop emergency measures for heavy rainfalls
 HEAT WAVES	– Mitigate heat islands – Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands) – Protect biodiversity against heat waves – Develop emergency measures for heat waves
 DESTRUCTIVE STORMS	– Increase infrastructures' and buildings' resilience to wind and freezing rain – Develop emergency measures in case of prolonged power outage (winter conditions) – Increase plants' resilience to wind and freezing rain
 DROUGHT	– Ensure the quality and quantity of drinking water – Increase infrastructures' and buildings' resilience to soil drying – Increase plants' resilience to drought
 RIVER FLOODS	– Increase infrastructures' and buildings' resilience to river floods – Develop emergency measures for flood-prone areas – Increase the stability of river banks facing erosion

These briefs have two purposes: to educate and to inform the agglomeration's various administrative units in regard to their commitments. As such, to begin with, we provide a summary of the benefits, co-benefits and details to consider for implementation. Since a climate change adaptation measure can translate into various actions, examples of such actions are also included on each brief.

After this general information, we present two tables listing the adaptation measures that Central Services and the administrative units have committed to implementing by 2020: one table for the departments and one for the cities and boroughs.

SAMPLE STRUCTURE FOR AN ADAPTATION MEASURES BRIEF

BENEFITS
Lists the direct positive effects of implementing the adaptation measure.

WHY?
Explains the main reasons why this measure is important to implement.

POTENTIAL CO-BENEFITS
Lists the indirect positive effects of implementing the adaptation measure. In some cases, we note the positive effects regarding other hazards.

WHAT WE CAN DO
Provides concrete examples of ways to implement the measure. These actions are only presented as possible options. The adaptation measure can be translated into many other actions.

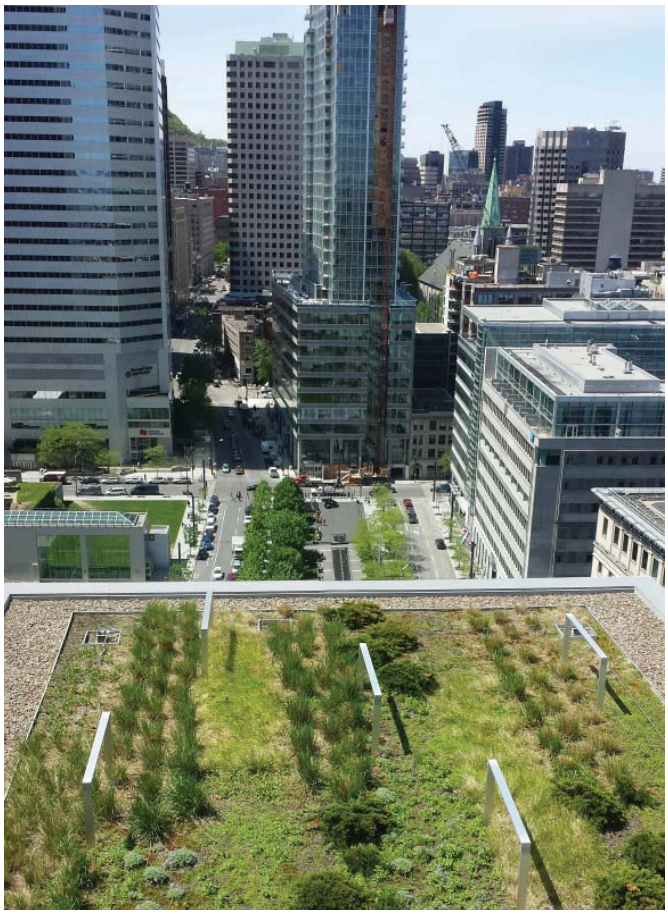
CONSTRAINTS AND MALADAPTATION RISKS
The constraints list the specific conditions or potential obstacles that must be taken into account when applying the adaptation measure. The maladaptation risks explain the negative effects that could arise from implementing a poorly planned action or one that fails to consider certain factors.

FOLLOW UP MECHANISMS

Central Services handles the implementation and monitoring of the measures promoted in the various plans, policies, programs and other initiatives they have developed, while the boroughs and municipalities are directly responsible for implementing the measures adopted within the Climate Change Adaptation Plan for the Montréal Urban Agglomeration.

We plan to carry out a mid-term report for the climate change adaptation plan in 2017-2018. This evaluation will also constitute an opportunity to make changes and additions to the plan as needed. A final report on this first Adaptation Plan will be published at the end of the Plan's period, which is 2015-2020.

To ensure the most precise monitoring possible, the commitments written into this Plan are accompanied, in most cases, by a specific goal and a monitoring indicator. Each department, city and borough will be responsible for providing the Service de l'environnement (environment department) with the data about their progress in implementing their measures for the mid-term and final reports.



Greened roof on one of the towers of the Québécor Média head office
Credit: © Philippe Aubry

BRIEF 1.1

Adaptation measures for higher average temperature

PROTECT BIODIVERSITY

Benefits

- Preservation of biodiversity and ecological services despite the disruptions associated with higher average temperature
- Better plant species resilience when faced with various stressors

Potential co-benefits

- Improved living environment
- Vegetation that reduces intra-urban heat islands
- Vegetation that helps to retain rainwater and reduce the quantity of water that escapes into the sewer system

Constraints and maladaptation risks

- Difficulty finding diversified species that are well suited to urban conditions
- Diversified plant species are not always available in tree and plant nurseries
- Lack of knowledge about current biodiversity

Why?

Lack of biodiversity, particularly among urban trees, makes the Montréal agglomeration vulnerable to current and future pest insect species. The impacts of Dutch elm disease and the emerald ash borer clearly illustrate the disastrous consequences of lack of urban biodiversity. As a result, all actions that aim to increase and preserve our existing biodiversity are among the most effective means for increasing the environment's resilience to climate change.

What we can do

- Equip ourselves with an urban forestry plan
- Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: on a street section)
- Increase the number of protected areas
- Maintain or restore the connectivity of green spaces and protected areas
- Include climate change scenarios in ecosystem planning and management
- Restore degraded ecosystems and support species recovery
- Select plants with various types of root systems in phytotechnology projects
- Put into place a monitoring network for current and future pests and invasive plant species
- Choose biological pest control methods
- Select plants adapted to new climate conditions
- Promote the My Space for Life Garden program

Adaptation measures for higher average temperature: Protect biodiversity

BRIEF 1.1

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Direction générale – Division du développement durable (headquarters – sustainable development division)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 8**: Try out replacement solutions for mineral abrasives **Action 31**: Establish a framework for collaboration to protect and develop areas of land that are rich in biodiversity **Action 32**: Make the most of green infrastructures and their ecological services in urban settings **Action 34**: Strengthen the ecological management of green spaces on the Montréal territory	X	
Service de la diversité sociale et des sports (social diversity and sport department)	Integrated urban revitalization program (IUR)	**IUR Territoire Nord-Est** (Montréal-Nord): Greening project for the spaces surrounding playing fields at five schools, which encourages plant biodiversity. **IUR Hodge-Place Benoît** (Saint-Laurent): Project to create an organic market garden production greenhouse complex in an urban setting; half of a greenhouse will be dedicated to applied research and development in the aim of introducing new cultures to diversify the range of plants on offer.	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation:** Reduce the risks associated with the impacts of climate change **Objective:** Increase the leaf surface area index to 25% by 2025 as well as the general greening of the territory **Orientation:** Protect and develop territories of ecological interest **Objective**: In the medium term, grow the share of protected ground surface areas to 10% of the territory, and more in the longer term	X	
Service de la mise en valeur du territoire (territory enhancement department)	Plan d'urbanisme de Montréal (2004) (2004 Montréal urban development plan – in French only)	**Objective 16**: Preserve and develop the natural heritage **Action 16.1**: Preserve and develop natural milieus and encourage their integration into urban development	X	
Service de l'environnement (environment department)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 34:** Strengthen the ecological management of green spaces on the Montréal territory	X	

Adaptation measures for higher average temperature: Protect biodiversity

BRIEF 1.1

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de l'environnement (environment department)	Aquatic environment monitoring program (programme de suivi du milieu aquatique)	**COURDO program**: evaluates the general quality of watercourses **QUALO program**: evaluates the water's bacteriological quality in rivers surrounding the Island of Montréal **RUISSO program**: evaluates the water quality in inland rivers and lakes **PLUVIO program**: evaluates the quality in stormwater sewer systems	X	
Service de l'Espace pour la vie (Space for Life department)	My Space for Life Garden program	Encourage the development of biodiversity zones in citizens' yards and balconies – certification program provided	X	
Service de l'Espace pour la vie (Space for Life department)	Citizen research and science program on the monarch butterfly	Better understand the monarch butterfly's distribution and identify its reproduction sites in the aim of protecting its populations	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 31**: Establish a framework for collaboration to protect and develop areas of land that are rich in biodiversity **Action 32**: Make the most of green infrastructures and their ecological services in urban settings	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Tree Policy of Montréal (2005)	The Tree Policy places the tree at the core of Montréal's urban planning to ensure that the city has a viable, sustainable future, improve the quality of living environments and give ourselves the gift of a green city that's more pleasant and in better health.	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Plan d'action canopée 2012-2021 (canopy action plan 2012-2021 – in French only)	This plan aims to reach 25% tree canopy in the Montréal agglomeration by 2025. This will translate into planting 300,000 trees, not counting the replacement of dead or sick trees.	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Politique de protection et de mise en valeur des milieux naturels (2004) (policy on the protection and development of natural environments (2004) – in French only)	This policy is a framework to ensure the longevity of natural environments, grow their surface area, and maximize biodiversity. A number of projects flow from the policy, including the adoption of a concept plan for the East island greenbelt, the consolidation of a number of ecoterritories, and the creation of a directory of protected natural environments in the Montréal agglomeration.	X	

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Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Plan d'action de la forêt urbaine (2015) - Volet lutte à l'agrile du frêne (urban forest action plan (2015) – emerald ash borer control section – in French only)	Strategy to slow the progress of the emerald ash borer and reduce its impacts in Montréal.	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Ecosystem management program	This program helps us better understand the dynamics of natural environments, and learn and monitor ecosystems to ensure their integrity and their quality for current and future generations. The program is in two parts: – Planning: including ecological audits (biophysical inventories) – Management: including interventions and the surveillance program	X	
Service des infrastructures, de la voirie et des transports (infrastructure, roads and transportation department)	Guide d'aménagement durable des rues de Montréal (2013) (Montréal sustainable street construction guide (2013) – in French only)	**Orientation**: Improve the protection of biodiversity in natural environments and green spaces **Objectives**: Make the most of green infrastructures and their ecological services in urban settings. Brief 8 of the Guide on urban ecology will specify, among other things, the optimal tree planting options for various categories of streets.	X	

Adaptation measures for higher average temperature: Protect biodiversity

BRIEF 1.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Equip ourselves with an urban forestry plan	Adopt an urban forestry plan				X	Adoption of a local plan
Ahuntsic-Cartierville	Select plants that are adapted to climate conditions	Put into place a list of plants that are resistant to our urban conditions Action carried out in relation to the Tree Policy and the local sustainable development plan		X			Number and type of plants used
Ahuntsic-Cartierville	Multiply the diversity of plant genera and species adapted to the environment on a local scale	Action carried out in relation to the Tree Policy Aim to encourage biodiversity in our landscape projects		X			Number and type of plants used
Ahuntsic-Cartierville	Restore degraded ecosystems and support species recovery in urban wooded areas and on public river banks	Plan projects to restore and maintain river banks and wooded areas on our territory		X			Number of restored sites Areas concerned
Ahuntsic-Cartierville	Take part in trainings and studies on biodiversity	IDENT-cité urban forest project Research project on biodiversity indicator calculations in urban environments		X			Number of trainings and research projects
Ahuntsic-Cartierville	Scout for present and future pests and invasive plants	Carry out informal inspection during site visits Inventory common buckthorn sites Require continuity of actions in the plan for controlling the emerald ash borer		X			Surface areas scouted in square metres (m^2)
Ahuntsic-Cartierville	Choose biological pest control methods	Pursue our citizen awareness-raising efforts in the aim of promoting biological pest control methods Adapt our work methods for public green spaces		X			Follow up and analysis of the pesticide report produced by borough employees
Anjou	Equip ourselves with an urban forestry plan	Canopy action plan adopted	X				Adoption of a local plan
Anjou	Promote the My Space for Life Garden program	Learn about the program and encourage maximum participation from the borough				X	Number of communication plans

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Anjou	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	The borough already chooses to use plants that best adapt to their environment		X			Areas concerned
Anjou	Maintain or restore the connectivity of green spaces and protected areas					X	Number of connections created
Anjou	Include climate change scenarios in ecosystem planning and management	Plants that wither are already gradually replaced by species that are better adapted to climate change		X			
Anjou	Restore degraded ecosystems and support species recovery	The borough plans to protect and develop the ecosystems present on the banks of its retention basin, following the policy on river banks, littoral zones and floodplains				X	Intervention
Anjou	Select plants with various types of root systems for phytotechnology projects	Select based on several criteria, including root system	X				Number and type of plants used
Anjou	Put a scouting network into place for present and future pest insects and invasive plants	The borough adheres to the measures set out in the common ragweed control program, established by health professionals		X			Number of actions taken
Anjou	Choose biological pest control methods	The borough only uses biological pest control methods		X			Number of actions taken
Anjou	Choose plants that are adapted to new climate conditions	The borough already emphasizes the use of plants that adapt to their environment the maximum degree		X			Number and type of plants used
Baie-D'Urfé	Multiply the diversity of plant genera and species adapted to the environment on a local scale			X			Number and type of plants used
Baie-D'Urfé	Choose plants that are adapted to new climate conditions			X			Number and type of plants used
Beaconsfield	Equip ourselves with an urban forestry plan			X			Adoption of a plan

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Beaconsfield	Establish a framework for collaboration to protect and develop areas of land that are rich in biodiversity	Agreement with the landowners of the Angell Woods to purchase or exchange land		X			Number of projects
Côte-des-Neiges–Notre-Dame-de-Grâce	Equip ourselves with an urban forestry plan	Plan already produced	X				Adoption of a local plan
Côte-des-Neiges–Notre-Dame-de-Grâce	Promote the My Space for Life Garden program	Collaborate with the Botanical Garden Integrate the My Space for Life Garden program into the Éco-quartiers programming				X	Number of certifications
Côte-des-Neiges–Notre-Dame-de-Grâce	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	This approach is already in place, particularly for choosing street trees. In the context of park landscaping, introduce a greater variety of plant species adapted to the environment			X		Areas concerned
Côte-des-Neiges–Notre-Dame-de-Grâce	Increase the number of protected areas	Include conservation areas in the plans for sectors in development (ex.: Hippodrome, the Triangle, Saint-Raymond)				X	Areas concerned (hectare)
Côte-des-Neiges–Notre-Dame-de-Grâce	Maintain or restore the connectivity of green spaces and protected areas	Collaborate to implement the Darlington project (project consisting of linking Mont-Royal green spaces to the Hippodrome)				X	Number of connections created
Côte-des-Neiges–Notre-Dame-de-Grâce	Include climate change scenarios in ecosystem planning and management	Apply in our projects				X	Number of projects that include climate change scenarios
Côte-des-Neiges–Notre-Dame-de-Grâce	Restore degraded ecosystems and support species recovery	When possible in repair projects				X	Areas concerned
Côte-des-Neiges–Notre-Dame-de-Grâce	Select plants with various types of root systems for phytotechnology projects	Include in future park and green space landscaping projects				X	Number and type of plants used
Côte-des-Neiges–Notre-Dame-de-Grâce	Put a scouting network into place for present and future pest insects and invasive plants	Develop a scouting strategy with the central city's collaboration				X	Number of actions taken

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-des-Neiges–Notre-Dame-de-Grâce	Choose biological pest control methods	Continue to use biological control products and methods		X			Number of actions taken
Côte-des-Neiges–Notre-Dame-de-Grâce	Choose plants that are adapted to new climate conditions	Establish a list of plants to plant and a tree inventory			X		Number and type of plants used
Côte-des-Neiges–Notre-Dame-de-Grâce	Help to implement a common information platform to raise citizens' awareness of the importance of biodiversity	Develop information briefs about biodiversity				X	Platform created and kept up to date
Côte-des-Neiges–Notre-Dame-de-Grâce	Sign the Déclaration de la collectivité de l'île de Montréal en faveur de la biodiversité et du verdissement (the Island of Montréal community's declaration in favour of biodiversity and greening – in French only)					X	Signature of the declaration
Côte-Saint-Luc	Equip ourselves with an urban forestry plan	Tree Policy + SIGMA (program to identify the number of trees on the territory)				X	Adoption of a local plan
Côte-Saint-Luc	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	Three to five species per street		X			Areas concerned
Côte-Saint-Luc	Select plants with various types of root systems for phytotechnology projects					X	Number and type of plants used
Côte-Saint-Luc	Put a scouting network into place for present and future pest insects and invasive plants	For the emerald ash borer				X	Number of actions taken
Côte-Saint-Luc	Choose plants that are adapted to new climate conditions				X		Number and type of plants used
Dollard-Des Ormeaux	Equip ourselves with an urban forestry plan	Adopt a local plan				X	Adoption of a local plan

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dollard-Des Ormeaux	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)					X	Number and type of plants used
Dollard-Des Ormeaux	Increase the number of protected areas					X	Areas concerned (hectare)
Dollard-Des Ormeaux	Maintain or restore the connectivity of green spaces and protected areas					X	Number of connections created
Dollard-Des Ormeaux	Put a scouting network into place for present and future pest insects and invasive plants					X	Number of actions taken
Dollard-Des Ormeaux	Choose biological pest control methods					X	Number of actions taken
Dollard-Des Ormeaux	Choose plants that are adapted to new climate conditions					X	Number and type of plants used
Dorval	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)			X		X	Areas concerned
Dorval	Choose plants that are adapted to new climate conditions			X		X	Number and type of plants used
Kirkland	Improve the maintenance of Hydro-Québec's easement to preserve natural wildflowers and wooded areas	Equip Hydro-Québec's easement with 500 m^2 of natural wildflowers and wooded areas by 2020				X	Number of square metres (m^2) landscaped
Kirkland	Perform ecological management of green spaces (no pesticides, grasscycling, compost)	Maintain current ecological management of green spaces		X			Areas concerned
Kirkland	Equip ourselves with an urban forestry plan	Write and publish an urban forestry plan by 2020				X	Adoption of a local plan
Kirkland	Equip ourselves with a tree policy	Write and publish a tree policy by 2020				X	Adoption of the policy

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Kirkland	Promote the My Space for Life Garden program	Obtain 200 certifications for the My Space for Life Garden program by 2020				X	Number of certifications
Kirkland	Maintain, restore and improve the connectivity of green spaces and protected areas	Maintain the connectivity between our green space and our parks and restore or improve them as needed		X			Number of connections created
Kirkland	Take climate change into account in land planning and management	Adapt land planning and management, while considering the data from the vulnerability analysis, by 2020				X	Number of projects that include the dimension of climate change
Kirkland	Scout for pest insects and invasive plant species	Maintain the systematic scouting of insects and invasive plants (ex.: the emerald ash borer)		X			Number of inspections on the ground Systematic scouting on call
Kirkland	Choose biological pest control methods	Continue to use biological control products and methods		X			Number of actions taken Use of biological control products and methods
Kirkland	Choose plants that are adapted to new climate conditions	Include at least 50% of plants that are adapted to the new conditions in our landscaping works by 2020				X	Planting / purchase report
Lachine	Help to design and implement a common information platform about biodiversity	Participate in the Ville de Montréal's web initiatives				X	Platform created and updated
Lachine	Take part in implementing the greening and biodiversity strategy					X	Number of projects
Lachine	Pursue the acquisition of shoreline properties along the river in order to protect them	Purchase a shoreline property, boulevard Saint-Joseph and 24e avenue	X				Creation of a park
Lachine	Pursue the adoption of ecological management practices for green spaces			X			Number of actions taken

Adaptation measures for higher average temperature: Protect biodiversity

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Lachine	Protect wooded spaces	Plant 550 trees in 2015 Adopt a plan to protect against the emerald ash borer that includes replacement when trees are cut down and treatment of lightly infested trees		X			Areas concerned
LaSalle	Plant many species of trees			X			Number of species
LaSalle	Deer hunting pilot project on the river's islands			X			Number of deer
LaSalle	Grant to the organization Héritage Laurentien to protect the parc des Rapides			X			Area concerned in square metres (m^2)
LaSalle	Develop criteria on cutting down private trees	Revise			X		Criteria revised
LaSalle	Equip ourselves with an urban forestry plan	Adopt a local plan			X		Adoption of a local plan
LaSalle	Promote the My Space for Life Garden program			X			Number of certifications
LaSalle	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)			X			Areas concerned
LaSalle	Increase the number of protected areas	When possible as part of reconstruction projects				X	Areas concerned (hectare)
LaSalle	Maintain or restore the connectivity of green spaces and protected areas			X			Number of connections created
LaSalle	Include climate change scenarios in ecosystem planning and management					X	Number of projects
LaSalle	Restore degraded ecosystems and support species recovery	When possible as part of reconstruction projects				X	Number of projects

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Put a scouting network into place for present and future pest insects and invasive plants			X			Number of actions taken
LaSalle	Choose biological pest control methods					X	Number of actions taken
LaSalle	Choose plants that are adapted to new climate conditions			X			Number and type of plants used
Le Plateau-Mont-Royal	Equip ourselves with an urban forestry plan	Adopt a local plan				X	Deliverable
Le Plateau-Mont-Royal	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	List species to favour based on their planting environment (ex.: street section versus green alley where the snow is not plowed)				X	Deliverable
Le Plateau-Mont-Royal	Select plants with various types of root systems for phytotechnology projects	Produce a synthesis report that encourages decision-making				X	Deliverable
Le Plateau-Mont-Royal	Put a scouting network into place for present and future pest insects and invasive plants	Establish trap monitoring sheets				X	Deliverable
Le Plateau-Mont-Royal	Choose biological pest control methods			X			Purchases
Le Plateau-Mont-Royal	Purchase ecologically friendly products for maintaining the park's chalets			X			Purchases
Le Plateau-Mont-Royal	Choose plants that are adapted to new climate conditions	Create a list of top species to choose				X	Deliverable
Le Plateau-Mont-Royal	Continue to use ecologically friendly products to treat the pond in parc La Fontaine			X			Purchases
Le Plateau-Mont-Royal	Expand the existing tree trenches and systematize the practice for new plantings	500 (including the replacement of trees cut down due to the emerald ash borer)		X			Number of trenches expanded

Adaptation measures for higher average temperature: Protect biodiversity

BRIEF 1.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Equip ourselves with an urban forestry plan	Create and adopt a local plan				X	Adoption of a local plan
Le Sud-Ouest	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	Implement a tree plan				X	Areas concerned
Le Sud-Ouest	Maintain or restore the connectivity of green spaces and protected areas	Create three connections				X	Number of connections created
Le Sud-Ouest	Put a scouting network into place for present and future pest insects and invasive plants	Include control of the emerald ash borer in our work procedures		X		X	Number of actions taken
Le Sud-Ouest	Continue the integrated control of pest insects	Include integrated control of the emerald ash borer in our work procedures		X		X	Number of actions taken
Le Sud-Ouest	Choose plants that are adapted to new climate conditions	Respect plant hardiness zones		X			List of plants to plant and tree inventory
Le Sud-Ouest	Equip ourselves with an urban forestry plan	Adopt an urban forestry plan				X	Adoption of the plan Conservation of existing trees Number of trees planted per species
Le Sud-Ouest	Plant diversified plant species	Plant according to the list of the borough's planted species		X			Number of trees and annuals planted (variety of species)
Le Sud-Ouest	Maintain and restore the connectivity of green spaces	Sentier de la Bourgogne project as part of the Quartier 21 program (Jazzman, Vinet and Oscar-Peterson parks)		X			Width of the landscaped path Number of connections
Le Sud-Ouest	Plant plants with phytotechnology capacity in the bioretention basin on rue Basin	Replace plants in the basin when necessary		X			Surface area of the basins

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Monitoring (scouting) of present and future pest insects and invasive plant species	Plan to control the emerald ash borer		X			Carrying out of the plan according to timetables
Le Sud-Ouest	Select plants adapted to climate conditions	Based on the list of plants to plant and the tree inventory		X			Respect of plant hardiness zones
L'Île-Bizard–Sainte-Geneviève	Equip ourselves with an urban forestry plan	Create, adopt and develop a local plan				X	Development of a local plan Adoption of a local plan
L'Île-Bizard–Sainte-Geneviève	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)			X			Areas concerned
L'Île-Bizard–Sainte-Geneviève	Increase the number of protected areas	To be determined			X		Areas concerned (hectare)
L'Île-Bizard–Sainte-Geneviève	Maintain or restore the connectivity of green spaces and protected areas			X			Number of connections created
L'Île-Bizard–Sainte-Geneviève	Choose biological pest control methods			X			Number of actions taken
L'Île-Bizard–Sainte-Geneviève	Choose plants that are adapted to new climate conditions			X			Number of plants
Mercier–Hochelaga-Maisonneuve	Equip ourselves with an urban forestry plan	Adopt a local plan				X	Adoption of a local plan
Mercier–Hochelaga-Maisonneuve	Promote the My Space for Life Garden program	As part of the activities of the Éco-quartier program				X	Number of certifications
Mercier–Hochelaga-Maisonneuve	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	Trees: 25 sections per year				X	Areas concerned
Mercier–Hochelaga-Maisonneuve	Increase the number of protected areas	Develop a habitat for grass snakes in the parc Carlos D'Alcantara	X				Areas concerned (hectare)

Adaptation measures for higher average temperature: Protect biodiversity

BRIEF 1.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mercier–Hochelaga-Maisonneuve	Maintain or restore the connectivity of green spaces and protected areas	Landscape the Longue-Pointe industrial spur connected to parc Ovila-Pelletier				X	Number of connections created
Mercier–Hochelaga-Maisonneuve	Restore degraded ecosystems and support species recovery	In four wooded areas within five years Eradicate the common buckthorn				X	Areas concerned (hectares)
Mercier–Hochelaga-Maisonneuve	Scout for present and future pests and invasive plants	This year, five pruners and the inspectors took a training on how to scout for the Asian longhorned beetle		X			Number of actions taken Number of staff trainings
Mercier–Hochelaga-Maisonneuve	Continue the integrated control of pest insects	Control the emerald ash borer		X			Number of actions taken
Mercier–Hochelaga-Maisonneuve	Choose plants that are adapted to new climate conditions	Select plants that can tolerate temperature extremes				X	Number and type of plants used
Montréal-Est	Equip ourselves with an urban forestry plan	Adopt a local plan			X		Adoption of a local plan
Montréal-Est	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	Add tree planting areas on the public right of way and flower beds with perennials			X		Areas concerned
Montréal-Est	Select plants with various types of root systems for phytotechnology projects	Add tree planting areas on the public right of way and flower beds with perennials			X		Number and type of plants used
Montréal-Est	Put a scouting network into place for present and future pest insects and invasive plants				X		Number of actions taken
Montréal-Est	Choose plants that are adapted to new climate conditions	Plan in effect		X			Number and type of plants used
Montréal-Nord	Equip ourselves with an urban forestry plan	Adopt a local plan		X		X	Adoption of a local plan (as part of the canopy project)
Montréal-Nord	Promote the My Space for Life Garden program					X	Number of certifications

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Nord	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	Diversify the choice of trees – see the list sent to Montréal		X			Number and type of plants used Surface areas concerned (as part of the canopy project)
Montréal-Nord	Maintain or restore the connectivity of green spaces and protected areas	Green corridor project – in the process of being carried out		X			Number of connections created
Montréal-Nord	Select plants with various types of root systems for phytotechnology projects	Diversify the choice of plants and trees – responsibilty of the horticulture team		X		X	Number and type of plants used (as part of the canopy project)
Montréal-Nord	Choose plants that are adapted to new climate conditions	Diversify the choice of plants and trees – responsibilty of the horticulture team		X		X	Number and type of plants used (as part of the canopy project)
Montréal-Ouest	Equip ourselves with an urban forestry plan	Adopt a local plan			X		Adoption of a local plan
Montréal-Ouest	Put a scouting network into place for present and future pest insects and invasive plants	Emerald ash borer: ash treatment program				X	Number of actions taken
Mont-Royal	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	Increase the number of participating streets				X	Areas concerned
Mont-Royal	Select plants with various types of root systems for phytotechnology projects	Continue to replace lawns with white clover		X			Number and type of plants used
Mont-Royal	Manage green spaces in an ecologically friendly way	Manage the Pierre-Elliott-Trudeau rose garden in a totally eco-friendly way (without pesticides) using effective natural substances		X			Areas concerned
Mont-Royal	Grow the effectiveness of urban forest management to improve its health and longevity	Three-year tree maintenance plan		X			

Adaptation measures for higher average temperature: Protect biodiversity

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Outremont	Choose biological pest control methods	Maintain the borough's current orientations, which are in exactly this direction		X			Number of actions taken
Pierrefonds-Roxboro	Develop the Rapides du Cheval blanc ecoterritory	Create a list of top species to choose				X	Establishment of the list
Pierrefonds-Roxboro	Develop a tree and urban forestry plan	Create and adopt a local plan			X		Adoption of the plan
Pointe-Claire	Create an urban forestry plan or policy	Keep our inventory up to date and choose an orientation for the city				X	Plan or policy
Pointe-Claire	Multiply the diversity of plant genera and species adapted to the environment on a local scale	Keep our forestry inventory and choose an orientation for the city in terms of species diversity				X	Urban forestry plan or policy
Pointe-Claire	Choose plants that are adapted to new climate conditions	Plant species for the 5A and 5B plant hardiness zones in order to adapt to climate change		X			Number of plants according to their hardiness
Pointe-Claire	Continue the integrated control of pest insects	Slow the progress of pest insects				X	Plan for controlling the emerald ash borer
Pointe-Claire	Create an educational garden for monarch butterflies	Build an educational monarch butterfly observation station by planting milkweed				X	Number of garden projects for monarch butterflies
Rivière-des-Prairies–Pointe-aux-Trembles	Equip ourselves with an urban forestry plan	Create the urban forestry plan for 2020				X	Adoption of a local plan
Rivière-des-Prairies–Pointe-aux-Trembles	Promote the My Space for Life Garden program	Collaborate with the Botanical Garden		X			Number of certifications
Rivière-des-Prairies–Pointe-aux-Trembles	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	This approach is already implemented, particularly for choosing street trees		X			Areas concerned
Rivière-des-Prairies–Pointe-aux-Trembles	Maintain or restore the connectivity of green spaces and protected areas	Restore connectivity based on the territory's development				X	Number of connections created

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rivière-des-Prairies–Pointe-aux-Trembles	Include climate change scenarios in ecosystem planning and management	Apply systematically in our projects				X	Number of projects that include climate change scenarios
Rivière-des-Prairies–Pointe-aux-Trembles	Restore degraded ecosystems and support species recovery	Apply systematically in projects to restore degraded environments				X	Number of projects that include the restoration of a degraded ecosystem
Rivière-des-Prairies–Pointe-aux-Trembles	Select plants with various types of root systems for phytotechnology projects	Apply systematically in our projects				X	Number of plants used
Rivière-des-Prairies–Pointe-aux-Trembles	Choose biological pest control methods	Note that in regard to the bylaw about pesticide use, apart from the exceptions set out in the bylaw, we are controlling pest insects according to biological pest control principles		X			Number of actions taken
Rivière-des-Prairies–Pointe-aux-Trembles	Choose plants that are adapted to new climate conditions	Apply systematically in our projects				X	Number of plants used
Rosemont–La Petite-Patrie	Restoration and wildlife management project for Boisé des Pères	Information signs on biodiversity (trees, birds, native species, etc.)	X				Not applicable
Rosemont–La Petite-Patrie	Landscaping that favours biodiversity	My Space for Life Garden program (bird garden, edibles garden and biodiversity garden) and Un jardin pour tous urban agriculture project on the grassy field of Centre Rosemont	X	X	X		Number of landscaping projects
Rosemont–La Petite-Patrie	Choose a variety of tree species for plantings	Favour biological diversity for the street and park canopy		X			Tree report
Rosemont–La Petite-Patrie	Take part in trainings and studies related to biodiversity	Study the quality and flow of the rivière à l'Orme in collaboration with the Loblaw Water Fund and Université de Montréal		X			Number of publications
Sainte-Anne-de-Bellevue	Carry out a biological control inventory and identify at-risk species within the municipality				X		Inventory

Adaptation measures for higher average temperature: Protect biodiversity

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Sainte-Anne-de-Bellevue	Encourage the use of phosphate-free products in Sainte-Anne-de-Bellevue		X				
Sainte-Anne-de-Bellevue	Encourage birds and waterfowl to nest in the area	Erect birdhouses for purple martins along the coast Encourage wood ducks and other waterfowl to nest in the area	X				Number of birdhouses
Sainte-Anne-de-Bellevue	Expand the fruit tree project alongside the bike path in the northern area and plan fruit trees and shrubs in public parks		X				Number of fruit trees planted
Sainte-Anne-de-Bellevue	Include green space protection and integration criteria in city planning				X		
Sainte-Anne-de-Bellevue	Encourage community gardens and other forms of urban agriculture in new residential, industrial and commercial developments and create more community garden spaces		X				Number of projects
Saint-Laurent	Increase the number of protected areas	Change the zoning bylaw to allow conservation areas in the Technoparc area and for the ruisseau Brook		X			Areas concerned (hectare)
Saint-Laurent	Equip ourselves with an urban forestry plan		X				Adoption of the plan
Saint-Laurent	Maintain or restore the connectivity of green spaces and protected areas	Develop a master plan to connect green spaces and natural environments in order to create biodiversity links				X	Number of connections created
Saint-Laurent	Revise the regulations relative to the protection of riverbanks, littoral zones and floodplains	Apply the current regulations, which are in keeping with the Schéma d'aménagement et de développement de l'agglomération de Montréal (Montréal urban agglomeration land use and development plan)			X		Number of projects subject to the bylaw's application

Adaptation measures for higher average temperature: Protect biodiversity

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Put programs into place to renaturalize river banks	Promote the development of the ruisseau Bertrand and ruisseau Brook with the Service des grands parcs, du verdissement et du mont Royal			X		Actions carried out
Saint-Laurent	Pursue the acquisition of shoreline properties in order to protect their environments	Identify conservation areas along the banks of the ruisseau Bertrand and ruisseau Brook		X	X		Adoption of a regulation
Saint-Laurent	Increase the number of plant species in order to foster tree biodiversity	Six different species planted in 2007 and 58 in 2013	X				Number of species planted
Saint-Laurent	Pursue landscaping and maintenance work in the wooded area of parc Marcel-Laurin			X			
Saint-Laurent	Continue to green parc Philippe-Laheurte			X			Hectares
Saint-Laurent	Continue the ecological management of green spaces and natural environments in the Dr-Bernard-Paquet and Guillaume-Bruneau parks			X			
Saint-Laurent	Foster biodiversity by selling bird feeders at an affordable price			X			Number of feeders sold
Saint-Laurent	Protect at-risk species by creating a certified Monarch Watch Station to attract monarch butterflies in the wooded area of parc Marcel-Laurin		X				Hectares
Saint-Laurent	Increase the number of protected areas	Adopted, in 2010, a draft bylaw aiming to change the zoning regulation in order to include the wooded area of parc Marcel-Laurin in the directory of protected natural areas set out by the borough council	X				Application of the bylaw
Saint-Laurent	Help to develop a collaborative framework in order to create, protect and develop territories that are rich in biodiversity			X			

Adaptation measures for higher average temperature: Protect biodiversity

BRIEF 1.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Help to develop an ecological management program for green spaces			X			
Saint-Laurent	Sign the Island of Montréal community declaration in favour of biodiversity and greening (available in French only)		X				Signature of the declaration
Saint-Laurent	Sign the letter of agreement with the Secretariat of the Convention on Biological Diversity in order to promote a common vision of urban biodiversity	Foster the exchange of knowledge and the development of activities and tools	X				Signature of the agreement in June 2015
Saint-Léonard	Update the borough's Tree Policy and harmonize it with that of the Ville de Montréal	Adopt the harmonized policy			X		Adoption of the harmonized policy
Saint-Léonard	Following the updating of the borough's Tree Policy, turn its recommendations into regulations	Adopt the bylaws				X	Adoption of the bylaws
Saint-Léonard	Promote the My Space for Life Garden program			X	X		Number of certifications
Saint-Léonard	Choose plants that are adapted to new climate conditions	Develop a list of plants that are adapted to new climate conditions				X	Development of a list
Saint-Léonard	Submit greening projects to various granting programs	De la racine à la cime (from root to crown) library project (Recognition of competencies – RAC), park landscaping projects, etc.		X		X	Number of projects submitted Number of projects that have received grants
Saint-Léonard	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)			X		X	Number of types and species used
Saint-Léonard	Analyze the possibility of protecting green spaces and natural environments	Identify spaces to protect (parks, bassin Chartier, other natural environments) and validate whether it is pertinent to protect them				X	Analysis As needed, hectares protected

Adaptation measures for higher average temperature: Protect biodiversity

BRIEF 1.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Léonard	Select plants with various types of root systems for phytotechnology projects	Produce a list of plants with various types of root systems in phytotechnology projects				X	List of plants selected
Saint-Léonard	Put a scouting network into place for present and future pest insects and invasive plants	Develop a scouting strategy with the collaboration of the central city				X	Number of cases scouted
Saint-Léonard	Choose biological pest control methods	Combinate adapted plants				X	Directory of initiatives taken
Saint-Léonard	Name an elm located in parc Delorme – a notable heritage tree – and adopt a bylaw to protect it	Bylaw adopted, elm named Carry out some surveying in order to name other notable trees	X			X	Number of trees named
Saint-Léonard	Update the borough's Tree Policy and harmonize it with that of the Ville de Montréal	Update the borough's Tree Policy and harmonize it with that of the Ville de Montréal, in 2015			X		Adoption of the Tree Policy
Senneville	Put measures into place to protect and develop woods, forest corridors, wetlands, shores, littoral zones and floodplains					X	
Verdun	Equip ourselves with an urban forestry plan	Plan adopted in 2014	X				Adoption of a local plan
Ville-Marie	Joint work with the Corporation Jeanne-Mance and the Montréal Botanical Garden to protect and increase biodiversity	Master plan for the Habitations Jeanne-Mance		X			Number of projects
Ville-Marie	Declare a heritage site for Mont-Royal	Protect native trees and plants Prohibit invasive plants and trees Adopt new standards from the landscaping plan companion document in a bylaw that is in keeping with the borough's urban development bylaw	X				Adoption of the new standards
Ville-Marie	Joint work with the Corporation Jeanne-Mance and the Montréal Botanical Garden to protect and increase biodiversity.	Revise the master plan for the Habitations Jeanne-Mance			X		Number of projects targeted

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ville-Marie	Protect and plant trees on the Mont-Royal site	Forest cover management plan		X			Number of trees planted
Villeray–Saint-Michel–Parc-Extension	Equip ourselves with an urban forestry plan	To be carried out in 2016-2018			X		Adoption of a local plan
Villeray–Saint-Michel–Parc-Extension	Promote the My Space for Life Garden program	10 private gardens per year (Éco-quartier mandate)		X			Number of certifications
Villeray–Saint-Michel–Parc-Extension	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)	Ensure biodiversity		X			Number and type of plants used
Villeray–Saint-Michel–Parc-Extension	Select plants with various types of root systems for phytotechnology projects	Apply systematically in our projects		X			Number and type of plants used
Villeray–Saint-Michel–Parc-Extension	Put a scouting network into place for present and future pest insects and invasive plants	Include control of the emerald ash borer in our practices		X			Number of actions taken
Villeray–Saint-Michel–Parc-Extension	Choose biological pest control methods	Continue to use biological control products and methods		X			Number of actions taken
Villeray–Saint-Michel–Parc-Extension	Choose plants that are adapted to new climate conditions	Apply systematically in our projects		X			Number and type of plants used
Westmount	Multiply the diversity of plant genera and species adapted to the environment on a local scale (ex.: street section)			X			Areas concerned
Westmount	Select plants with various types of root systems for phytotechnology projects			X			Number and type of plants used
Westmount	Put a scouting network into place for present and future pest insects and invasive plants			X			Number of actions taken
Westmount	Choose biological pest control methods			X			Number of actions taken
Westmount	Choose plants that are adapted to new climate conditions			X			Number and type of plants used

Adaptation measures for higher average temperature

INCREASE INFRASTRUCTURES' RESILIENCE TO THE FREEZE-THAW CYCLE

Benefits

- Reduction of damages to infrastructures and buildings caused by the freeze-thaw cycle
- Cost reduction: in most cases, preventive adaptation measures are less costly than reactive ones

Potential co-benefits

- Improved citizen safety (in regard to falling fragments from some civil works)
- Reduced damages to vehicles (in regard to the forming of potholes)
- Improved road traffic movement

Constraints and maladaptation risks

- Make sure to account for drainage quality and work surveillance during road repair

Why?

During winter thaws, water can leak through concrete and layers of asphalt. Then, when it freezes again, the water turns into ice, and this expansion causes the weakened asphalt to loosen and tear away. Freeze-thaw cycles also cause concrete infrastructures and layers of asphalt concrete to deteriorate, which leads to falling concrete fragments and potholes. The use of road salts amplifies this impact.

What we can do

- Adapt road infrastructure design and construction criteria in order to ensure that they are resilient to the freeze-thaw cycle
- Adapt inspection and maintenance procedures for infrastructures to take this phenomenon into account and ensure their resilience (ex.: prevent falling fragments from some civil works–particularly bridges, tunnels and overpasses–during mild spells in winter)
- Take part in research projects and pilot projects aiming to evaluate the impacts of climate change on infrastructures and develop adaptation measures (ex.: trials of new materials)

Adaptation measures for higher average temperature: Increase infrastructures' resilience to the freeze-thaw cycle

BRIEF 1.2

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service des infrastructures, de la voirie et des transports (infrastructure, roads and transportation department)	Operation to verify structures and apply preventive safety measures	Emergency inspection of vulnerable infrastructures during mild spells in winter to prevent falling fragments from some civil works (bridges, tunnels and overpasses)–added to to the regular inspection program	X	
Service des infrastructures, de la voirie et des transports (infrastructure, roads and transportation department)	Annual structure inspection program	Rigorous annual inspection program for all the city's structures	X	

Adaptation measures for higher average temperature: Increase infrastructures' resilience to the freeze-thaw cycle

BRIEF 1.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Apply the standardized specifications developed by the central city		X			Number of projects
Anjou	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	All the borough's road infrastructures are adapted to the new standards in effect		X			Number of projects
Anjou	Take part in research or pilot projects aiming to evaluate the impacts of climate change on infrastructures and develop adaptation measures (ex.: trials of new materials)			X			Number of projects
Baie-D'Urfé	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle					X	Areas concerned
Beaconsfield	Accelerate the pipe lining and rehabilitation program for our infrastructures					X	Number of projects
Côte-des-Neiges–Notre-Dame-de-Grâce	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Repave when cuts are made in new pavement (1 to 35 years) to prevent water leakage		X			Areas concerned
Côte-Saint-Luc	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Develop specifications for the construction of new bases and road rebuilding Reconstruct five feet deep to develop the base Surface areas concerned up to 2015: 17,795 m^2				X	Areas concerned

Adaptation measures for higher average temperature: Increase infrastructures' resilience to the freeze-thaw cycle

BRIEF 1.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-Saint-Luc	Adapt infrastructure inspection and maintenance procedures in regard to the freeze-thaw cycle in order to ensure their resilience (ex.: prevent falling fragments from some civil works, particularly bridges, tunnels and overpasses during mild spells in winter)	Study of road surface conditions (subcontracted) every ten years underway as of 2015 For sidewalks, this will be carried out internally as needed		X			Adoption of new procedures
Côte-Saint-Luc	Take part in research or pilot projects aiming to evaluate the impacts of climate change on infrastructures and develop adaptation measures (ex.: trials of new materials)	Research project underway: Convectional flow of ground water to heat sidewalks (geothermics) Number of projects: 1		X			Number of projects
Dollard-Des Ormeaux	Adopt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle		X				Areas concerned
Dorval	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle					X	Areas concerned
Dorval	Take part in research or pilot projects aiming to evaluate the impacts of climate change on infrastructures and develop adaptation measures (ex.: trials of new materials)					X	Number of projects
Kirkland	Maintain and adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Maintain and adapt (as needed) road infrastructure design and construction criteria		X			Number of annual inspections
Kirkland	Maintain infrastructure inspections and maintenance in regard to the freeze-thaw cycle to ensure their resilience and adopt new procedures	Maintain infrastructures in regard to the freeze-thaw cycle and adopt new procedures as needed		X			Adoption of new procedures

Adaptation measures for higher average temperature: Increase infrastructures' resilience to the freeze-thaw cycle

BRIEF 1.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Install aqueduct pipes two metres deep when they are being replaced			X			Cumulative length of pipes installed
LaSalle	Change our snow removal methods			X			
LaSalle	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Bury pipes two metres deep, build thicker road bases, use new materials only	X				Areas concerned
Le Plateau-Mont-Royal	Change the practices for filling potholes by favouring larger surface areas	50 seals by 2020				X	Number of seals
L'Île-Bizard–Sainte-Geneviève	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Following standards: 100% of standards applied		X			Standards in effect
Mercier–Hochelaga-Maisonneuve	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	The borough is ready to collaborate on new projects				X	Areas concerned
Mercier–Hochelaga-Maisonneuve	Take part in research or pilot projects aiming to evaluate the impacts of climate change on infrastructures and develop adaptation measures (ex.: trials of new materials)	The borough is ready to collaborate on new projects				X	Number of projects
Montréal-Nord	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle					X	Areas concerned
Mont-Royal	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle					X	Areas concerned
Mont-Royal	Roads – install bases/sub-bases following stricter standards than those of the BNQ (Bureau de normalisation du Québec)			X			Areas concerned

Adaptation measures for higher average temperature: Increase infrastructures' resilience to the freeze-thaw cycle

BRIEF 1.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mont-Royal	Install pipes and bases more deeply to avoid freezing			X			Cumulative length of pipes installed
Pierrefonds-Roxboro	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Bury pipes two metres deep, build thicker road bases, use new materials only		X			Areas concerned
Pointe-Claire	Maintain infrastructure inspections and maintenance in regard to the freeze-thaw cycle to ensure their resilience and adopt new procedures	Maintain infrastructures in regard to the freeze-thaw cycle and adopt of new procedures as needed		X			Frequency of inspections and maintenance
Rivière-des-Prairies–Pointe-aux-Trembles	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Plan to use natural granular materials for road sub-base				X	Area of sub-base made of natural granular material in square metres (m^2)
Rivière-des-Prairies–Pointe-aux-Trembles	Take part in research or pilot projects aiming to evaluate the impacts of climate change on infrastructures and develop adaptation measures (ex.: trials of new materials)	Take part in trials with relevant organizations (laboratories)				X	Number of trials carried out
Rosemont–La Petite-Patrie	Adapt infrastructure inspection and maintenance procedures in regard to the freeze-thaw cycle in order to ensure their resilience (ex.: prevent falling fragments from some civil works, particularly bridges, tunnels and overpasses during mild spells in winter)	For the pothole operation, make pavement repairs in winter, during milder spells (change materials and tools)	X				Report on public works operations
Rosemont–La Petite-Patrie	Take part in research or pilot projects aiming to evaluate the impacts of climate change on infrastructures and develop adaptation measures (ex.: trials of new materials)	Spreading operation: research and test various abrasives, constantly seeking the best product Adapt equipment and work methods to optimize operations Snow project underway: working group to discuss best snow removal practices		X			Report on public works operations

Adaptation measures for higher average temperature: Increase infrastructures' resilience to the freeze-thaw cycle

BRIEF 1.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	If the pilot project gives anticipated results, use a pre-seepage of de-icing salts in snow removal operations, as of 2013. Thanks to this technique, less salt will be used		X				Number of kilometres of street
Saint-Léonard	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Apply the standards set by the ministère des Transports du Québec				X	Percentage of projects carried out based on these criteria
Senneville	Adapt infrastructure inspection and maintenance procedures in regard to the freeze-thaw cycle in order to ensure their resilience (ex.: prevent falling fragments from some civil works, particularly bridges, tunnels and overpasses during mild spells in winter)					X	Adoption of new procedures
Verdun	Adapt infrastructure inspection and maintenance procedures in regard to the freeze-thaw cycle in order to ensure their resilience (ex.: prevent falling fragments from some civil works, particularly bridges, tunnels and overpasses during mild spells in winter)	Adopt new procedures				X	Adoption of new procedures
Villeray–Saint-Michel–Parc-Extension	Adapt road infrastructure design and construction criteria to ensure their resilience to the freeze-thaw cycle	Apply the construction standards in effect				X	Areas concerned
Westmount	In concert with the Federation of Canadian Municipalities (FCM) and the Union des municipalités du Québec (UMQ), seek funding from the higher echelons of government in order to maintain the safety and longevity of public infrastructures					X	Number of grants obtained

Adaptation measures for higher average temperature

ADAPT THE SLATE OF WINTER RECREATIONAL ACTIVITIES AND MAINTENANCE OPERATIONS

Benefits

- Renewal and diversification of the slate of outdoor activities

Potential co-benefits

- Contribution to citizens' wellbeing and health through the creation of an environment conducive to physical activity

Constraints and maladaptation risks

- Cancellation or revision of the programming for some winter events based on the changing climate
- Increased construction and set-up costs for some facilities (ex.: refrigerated outdoor rinks)
- Possible increased maintenance costs (additional staff required and bigger budgets allotted)
- Increased energy consumption (if we opt, for instance, for refrigerated skating rinks)

Why?

Higher average temperature and the more frequent oscillations around the freezing point during the winter will require us to pay careful attention, as they can threaten the quality and variety of activities and sports on offer. To meet the population's needs while offering a diverse range of programs and facilities, cities must be particularly attentive to these new climate conditions.

What we can do

- Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)
- Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season means that activities must be concentrated into shorter time frames, which can lead to increased traffic and higher staffing needs)
- Adapt maintenance methods for outdoor recreational infrastructures and follow the development of, or develop, new maintenance techniques (ex.: cross-country ski trails with less snow)
- Plan other uses for sites

Adaptation measures for higher average temperature : Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Diversify the slate of outdoor activities and adapt programming based on climate hazards	Adjust the slate for the spring break week depending on climate conditions		X	X		Changes to programming during extreme conditions
Ahuntsic-Cartierville	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development and progress of new maintenance techniques	Remain on top of new maintenance techniques and equipment available on the market		X			Type and number of new maintenance techniques
Anjou	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)					X	Number of winter activities
Anjou	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)					X	Type and number of activities based on weather
Baie-D'Urfé	Take climate change into account when choosing outdoor infrastructures					X	Number of projects
Côte-Saint-Luc	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	The outdoor skating rink (Confederation Annex) is used all year round (garage sales, public market, cosom hockey, special events)		X			Changes to programming
Dollard-Des Ormeaux	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)					X	Changes to programming
Dollard-Des Ormeaux	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)					X	Type and number of activities based on weather

Adaptation measures for higher average temperature: Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dollard-Des Ormeaux	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)					X	Type and number of new maintenance techniques
Dorval	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)			X		X	Changes to programming
Kirkland	Diversify the slate of outdoor activities	Vary the activities offered during the winter season		X			Number and type of activities offered
Kirkland	Adapt outdoor activity programming based on the changing climate	Maintain the adaptation already in place		X			Type and number of activities based on weather
Kirkland	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques	Continually research ways to improve our maintenance methods and techniques for winter recreational activities		X			Type and number of new maintenance techniques
Lachine	Clear trails	Since 2012, we have been clearing the walking trail along the shoreline as well as a trail close to a number of seniors' homes. In total, more than 5 km are now cleared	X				Kilometre (km) of walking trail cleared
LaSalle	Modulate the opening hours of outdoor skating rinks			X			Change to the opening period based on weather
LaSalle	Build a Bleu, Blanc, Bouge refrigerated skating rink		X				Building of the skating rink
LaSalle	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)			X			Changes to programming

Adaptation measures for higher average temperature: Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)			X			Type and number of activities based on weather
LaSalle	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)			X			Type and number of new maintenance techniques
Le Plateau-Mont-Royal	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Create programming				X	Changes to programming
Le Plateau-Mont-Royal	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Plan and follow up				X	Type and number of new maintenance techniques
Le Sud-Ouest	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Conduct a needs analysis for citizens and organizations and adapt as a result		X		X	Changes to programming
Le Sud-Ouest	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Conduct a needs analysis for citizens and organizations and adapt as a result		X		X	Changes to programming

Adaptation measures for higher average temperature: Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Adapt maintenance operations to new activities	Adapt based on temperature changes		X		X	Number of employees and their functions changed with temperature
Le Sud-Ouest	Meetings toward the development of parc Angrignon	Snowshoe trail project and refrigerated outdoor skating rink project for parc Angrignon		X			Number of meetings
L'Île-Bizard–Sainte-Geneviève	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)			X			Number of activities
L'Île-Bizard–Sainte-Geneviève	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)		X				Changes to programming
Mercier–Hochelaga-Maisonneuve	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Build a snow slide slope				X	Changes to programming
Montréal-Nord	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	The outdoor skating rink season is modulated based on the length and intensity of the winter season		X			Type and number of activities based on weather
Montréal-Nord	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)			X			Type and number of new maintenance techniques
Mont-Royal	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)		X				Changes to programming

Adaptation measures for higher average temperature: Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mont-Royal	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Five outdoor and two indoor skating rinks	X				Type and number of activities based on weather
Mont-Royal	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)			X			Type and number of new maintenance techniques
Pierrefonds-Roxboro	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Carry out 100% of planned activities			X		Changes to programming
Pointe-Claire	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Offer a wider diversity of outdoor activities				X	Number of activities
Rivière-des-Prairies-Pointe-aux-Trembles	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Propose new activities adapted to the activity board				X	New outdoor activities
Saint-Laurent	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Boost the range of service offered in culture, sports and leisure by constructing a new library and a sports complex		X			Number of projects

Adaptation measures for higher average temperature: Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Léonard	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Outdoor skating rinks are outdoor volleyball fields in the summer Project for a refrigerated skating rink and dance floor in summer	X			X	Number of adaptations made
Saint-Léonard	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Programming with outdoor cardio Program with Québec en forme		X		X	Number of adaptations made
Saint-Léonard	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Test out new maintenance methods				X	Type and number of new maintenance techniques
Senneville	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)					X	
Senneville	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)					X	
Verdun	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Hold a winter carnival lasting longer than three days				X	Holding of a winter carnival lasting longer than three days

Adaptation measures for higher average temperature: Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Verdun	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Concentrate activities in January	X			X	Holding of a winter carnival lasting longer than three days Skating at the Flambeau
Verdun	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Create a maintenance master plan with public works – Master plan created in 2016			X		Master plan created in 2016
Ville-Marie	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.).	Sports festival and skating rink entertainment		X			Type and number of activities based on weather
Villeray–Saint-Michel–Parc-Extension	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Adapt and change programming as needed				X	Changes to programming
Villeray–Saint-Michel–Parc-Extension	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Adapt and change programming as needed			X	X	Type and number of activities based on weather
Villeray–Saint-Michel–Parc-Extension	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Adapt the surface which the infrastructure sits on using reflective materials				X	Type and number of new maintenance techniques

Adaptation measures for higher average temperature: Adapt the slate of winter recreational activities and maintenance operations

BRIEF 1.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Westmount	Diversify the slate of outdoor activities (ex.: plan other uses for skating rinks and focus on new activities)	Install six outdoor skating rinks in parks during the winter	X				Changes to programming
Westmount	Adapt outdoor activity programming based on the changing climate (ex.: a shorter snowy season requires that activities be concentrated in time, more staff must be hired, attendance will be higher, etc.)	Hold a carnival for residents in February – three days of activities	X				Type and number of activities based on weather
Westmount	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Open the bike path year-round	X				Type and number of new maintenance techniques

BRIEF 1.4

Adaptation measures for higher average temperature

BROADEN THE SLATE OF SUMMER RECREATIONAL ACTIVITIES AND MAINTENANCE OPERATIONS

Benefits

- Preservation and development of Montréal's attractiveness for summer recreational activities, by boosting the range of summer outdoor activities, which can lead to economic gains
- Varied range of services and extended programming that reflects the population's needs

Potential co-benefits

- Economic development opportunities associated with a wider range of summer activities

Constraints and maladaptation risks

- New planning challenges related to a more variable summer climate
- Increased pressure on some infrastructures due to heavier usage
- Change to the length of the operating season (human resources)
- Labour shortage – Risk of desynchronization between needs and the availability of seasonal student labour
- Increased maintenance and operating costs
- Increased water quality monitoring

Why?

The higher average temperature in summertime is not necessarily perceived as a constraint. In fact, the longer warm season may have advantages for citizens who enjoy being outdoors and can lead to positive economic benefits for the tourism industry.

What we can do

- Adapt outdoor activity programming based on a lengthening summer season, and provide a prolonged slate of services (ex.: festivals, recreation, longer opening season for pools, sports fields, staff management and allotted budgets, bicycle paths, access to communal bicycles (BIXI), etc.)
- Adapt the maintenance schedule for parks and other recreational spaces based on the longer summer

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (extended opening hours for pools, staff and budget management)	Staff availability issues Budget issues In springtime, the borough is dependent on the central city for pool opening		X			Change to the regular activity schedule
Ahuntsic-Cartierville	Adapt the maintenance schedule for parks and green spaces based on the longer summer (ex.: mowing, watering, etc.)	Plan a call for bids for private sector services to meet the additional needs for green space maintenance in springtime (lack of in-house resources)		X		X	Number of employees and employee functions changed based on temperature
Anjou	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Opening hours for pools and wading pools are extended during heat waves		X			Number of summer activities
Anjou	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Maintenance techniques for recreational infrastructures will from now on be developed in collaboration with the urban planning service for various projects		X			Type and number of new maintenance techniques
Baie-D'Urfé	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer					X	Number of employees and employee functions changed based on temperature
Beaconsfield	Make the most of green infrastructures and their ecological services in the urban environment	Create north-south bike paths to link the parc-nature de l'Anse-à-l'Orme, the Angell woods and Beaurepaire station to chemin Lakeshore				X	Cumulative length (km) of new bike paths

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-des-Neiges–Notre-Dame-de-Grâce	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Continue to improve the practices put into place for new facilities, such as the Canadiens' outdoor skating rink, and for activities such as cross-country skiing in some parks		X			Type and number of new maintenance techniques
Côte-Saint-Luc	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	The work periods for temporary employees are approximate (no set schedule or precise start and end dates), which allows flexibility in planning operations while being in keeping with the blue-collar employees' collective agreement		X			Number of employees and employee functions changed based on temperature
Dollard-Des Ormeaux	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)					X	Changes to programming
Dollard-Des Ormeaux	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer					X	Number of employees and employee functions changed based on temperature
Dorval	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)			X		X	Changes to programming
Dorval	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer			X		X	Number of employees and employee functions changed based on temperature

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Kirkland	Adapt the programming of outdoor activities based on the lengthening summer and provide sufficient services	Maintain the adaptation already in place and improve it over time		X			Changes to programming
Kirkland	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Maintain the adaptation already in place and improve it over time		X			Number of employees and employee functions changed based on temperature
Lachine	Adapt maintenance methods for outdoor recreation infrastructures and monitor the development of and/or develop new maintenance techniques (ex.: ice surfaces, cross-country ski trails with less snow)	Create a master plan for aquatic facilities maintenance				X	Type and number of new maintenance techniques
LaSalle	Adapt the slate of summer recreational activities	The borough offers eight outdoor pools and 16 splash pads spread across its territory	X				Changes to programming
LaSalle	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)			X			Changes to programming
LaSalle	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer			X			Number of employees and employee functions changed based on temperature
Le Plateau-Mont-Royal	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Plan operations based on the longer summer	X				Number of employees and employee functions changed based on temperature

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Analyze the needs of citizens and organizations and adapt in consequence		X		X	Changes to programming
Le Sud-Ouest	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Adapt based on changes to temperature		X		X	Number of employees and employee functions changed based on temperature
Le Sud-Ouest	Transform wading pools into splash pads	Favour greater accessibility		X		X	Number of wading pools transformed
L'Île-Bizard–Sainte-Geneviève	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Extension already offered		X			Changes to programming
L'Île-Bizard–Sainte-Geneviève	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer		X				Number of employees and employee functions changed based on temperature
Mercier–Hochelaga-Maisonneuve	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Extend scheduling hours and open splash pads ad hoc as needed				X	Changes to programming
Mercier–Hochelaga-Maisonneuve	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Extend the lawn mowing and plant watering schedule as needed				X	Number of employees and employee functions changed based on temperature

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mercier–Hochelaga-Maisonneuve	Adapt the slate of summer recreational activities	Construct splash pads and create exercise modules tailored to the clientele				X	Changes to programming
Montréal-Est	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Make and update summer programs based on the season		X			Changes to programming
Montréal-Est	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer			X			Number of employees and employee functions changed based on temperature
Montréal-Nord	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Outdoor activities (pools, wading pools, sports fields) are available based on needs and outdoor temperature		x			Changes to programming
Montréal-Nord	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Maintenance activities are performed based on outdoor temperature and needs		x			Number of employees and employee functions changed based on temperature
Montréal-Ouest	Transform wading pools into splash pads	In parc Davies			X		Number of wading pools transformed
Mont-Royal	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)			X			Changes to programming

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mont-Royal	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer			X			Number of employees and employee functions changed based on temperature
Outremont	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Adapt staff and budgets as required for these very necessary changes to our programming		X			Changes to programming
Outremont	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Adapt the schedule based on needs				X	Number of employees and employee functions changed based on temperature
Pierrefonds-Roxboro	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Extend the lawn mowing and plant watering schedule as needed				X	Number of employees and employee functions changed based on temperature
Pierrefonds-Roxboro	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (extended opening hours for pools, staff and budget management)	Increase the operating budget				X	Changes to the regular schedule of summer activities
Pointe-Claire	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (extended opening hours for pools, staff and budget management)	Adapt the slate of services offered by the ville de Pointe-Claire to match citizens' needs				X	Type and number of summer activities provided to citizens

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rivière-des-Prairies–Pointe-aux-Trembles	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Increase the operating budget				X	Changes to the regular schedule of summer activities
Sainte-Anne-de-Bellevue	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Pool opening hours are extended and the season is extended		X			Changes to programming
Saint-Laurent	Expand the slate of services in culture, sports and leisure with the construction of a new library and a sports complex	Offer indoor activities in air-conditioned buildings		X			Number of projects
Saint-Léonard	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Extend opening periods (pools, tennis, splash pads)		X			Number of adaptations made
Saint-Léonard	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Add this measure to the parks maintenance specifications for 2015			X		Number of employees and employee functions changed based on temperature
Senneville	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)					X	

Adaptation measures for higher average temperature: Broaden the slate of summer recreational activities and maintenance operations

BRIEF 1.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Senneville	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer					X	
Verdun	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Increase the number of weeks that pools are open: end the season a week later, meaning from June 23 to August 23	X	X			Increased number of weeks open
Verdun	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Create a maintenance master plan with Public Works – master plan created in 2016			X		Master plan created in 2016
Ville-Marie	Extend the opening of wading pools and water jets					X	Changes to the regular schedule of summer activities
Ville-Marie	Fall programming					X	
Villeray–Saint-Michel–Parc-Extension	Adapt the programming for outdoor activities to the lengthening summer season and provide sufficient services (ex.: festivals, leisure activities, extended opening hours for pools, playing fields, bike paths, management of staff and allotted budgets, etc.)	Adapt and change programming as needed		X			Changes to programming
Villeray-Saint-Michel-Parc-Extension	Adapt the maintenance schedule for parks, green spaces and street trees based on the longer summer	Rework schedules		X			Number of employees and employee functions changed based on temperature
Westmount	Hold parties for residents	Family Day, Saint-Jean-Baptiste, Canada Day, outdoor plays and concerts in the park		X			Number of parties per year

Adaptation measures for higher average temperature

CONTROL UNDESIRABLE PLANT SPECIES

Benefits

- Protection of biodiversity (in the case where the controlled plant species is an invasive one)
- Reduction of the impacts of allergenic plant species proliferation (ex.: common ragweed) on allergy sufferers' health
- Potential savings if we act quickly to control undesirable plant species (requires less labour and costs less than if we wait too long)

Potential co-benefits

- Improvements to citizens' living environmentss

Constraints and maladaptation risks

- Lack of labour and budgets for inventory and species control operations

Why?

Higher average temperatures could encourage undesirable plant species, including some invasive plants (ex.: Japanese knotweed) and some allergenic plants (ex.: common ragweed). Our ability to limit the negative effects of these plants on biodiversity and on health will depend, among other things, on our knowledge of their geographic distribution, their abundance, and the means available for controlling them.

What we can do

- Draw up a list of the most concerning undesirable plant species for the Montréal territory
- Set up a monitoring network for invasive plant species
- When possible, map the areas potentially likely to encourage the growth of undesirable plant species
- Establish a geolocated inventory of undesirable plant species already present on the territory in order to prioritize interventions and to be able to monitor populations over time
- Draw up a list of plant species to monitor (which are not on our territory, but which may begin to grow in Montréal because of higher temperatures)
- Develop an action plan for effectively managing undesirable plant species
- Raise citizens' awareness to help them recognize undesirable plant species
- Raise citizens' awareness of the impacts and measures to take to prevent the propagation of undesirable plant species

Adaptation measures for higher average temperature: Control undesirable plant species

BRIEF 1.5

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	Measure set out in chapter 4 of the Schéma (the companion document) relative to the prohibition of invasive plant species on land located less than 100 metres from a currently or soon-to-be protected natural environment or a local park that includes natural environments of interest	X	
Service de l'environnement (environment department)	Reporting network for invasive plants	Reporting of certain invasive plants in Montréal Species identification and geolocation	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Ecosystem management program – monitoring and control of harmful and invasive plant species	Monitoring of invasive plant populations and targeted control projects for nature parks and ecoterritories	X	

Adaptation measures for higher average temperature: Control undesirable plant species

BRIEF 1.5

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Increase ecological management for green spaces, more specifically eco-friendly management of lawns	Develop a strategic plan to manage green spaces and create a list of sites in the aim of maintaining our lawns using techniques that are better tailored to new urban conditions Reduce mowing depending on site specifics and increase biodiversity				X	Development of a document
Anjou	Develop and promote a plan for the effective management of common ragweed	The borough follows the ctiy's current common ragweed program, which was developed with the help of health professionals		X			Development of a common ragweed management plan
Baie-D'Urfé	Develop and promote a plan for the effective management of common ragweed	Implement a plan				X	
Côte-Saint-Luc	Develop and promote a plan for the effective management of common ragweed	Annually apply a biopesticide on critical areas (56 km); monitor application and results from preceding years		X			
Dollard-Des Ormeaux	Continue the plan for effective common ragweed management	Apply chapter 5 of the bylaw on nuisances and ground-level monitoring		X			
Kirkland	Produce an awareness-raising campaign on common ragweed through local media	Maintain awareness-raising programs		X			Number of publications
Kirkland	Maintain grouds	Continue maintenance on public grounds based on common ragweed blooming seasons		X			Mowing schedule
Lachine	Manual uprooting of common ragweed plants	Carried out annually		X			Area treated
LaSalle	Maintain grouds	Mow lawns regularly		X			Area treated
LaSalle	Eradicate invasive plants on the river's banks			X			Surfaces concerned in square metres (m^2)
Le Sud-Ouest	Control common ragweed	Mow vacant grounds in August		X			Mowing of vacant grounds in August

Adaptation measures for higher average temperature: Control undesirable plant species

BRIEF 1.5

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
L'Île-Bizard–Sainte-Geneviève	Develop and promote a plan for the effective management of common ragweed	Implement a plan				X	
Mercier–Hochelaga-Maisonneuve	Restore degraded ecosystems and support species recovery	Eradicate common buckthorn in four wooded areas within five years				X	Area treated
Montréal-Est	Develop and promote a plan for the effective management of common ragweed	Perform recurrent maintenance of areas to prevent propagation		X			Area treated
Montréal-Nord	Develop and promote a plan for the effective management of common ragweed	Our parks employees systematically uproot common ragweed on public land An advertising campaign is carried out targeting citizens		X			
Montréal-Ouest	Develop and promote a plan for the effective management of common ragweed					X	Creation and updating of the website / Facebook page
Mont-Royal	Develop and promote a plan for the effective management of common ragweed	Green patrol during the summer		X			
Mont-Royal	Regularly cut grasses	Raise awareness among citizens		X			Area treated
Pierrefonds-Roxboro	Maintain grouds	Continue maintenance on public grounds based on common ragweed blooming seasons		X			Mowing schedule
Pointe-Claire	Awareness-raising campaign about common ragweed control	Encourage citizens to uproot common ragweed and mow the lawn twice yearly		X			Number of communications to citizens
Sainte-Anne-de-Bellevue	Control and restrict the growth of invasive species			X			Area concerned
Saint-Laurent	Develop and promote a plan for the effective management of common ragweed	Apply the bylaw's article on cleanliness aiming to oblige citizens to cut long grass by three deadlines		X			Number of inspections and number of warnings

Adaptation measures for higher average temperature: Control undesirable plant species

BRIEF 1.5

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Senneville	Develop and promote a plan for the effective management of common ragweed					X	
Verdun	Develop and promote a plan for the effective management of common ragweed	Create and distribute prospectus				X	Number of prospectus distributed
Westmount	Develop and promote a plan for the effective management of common ragweed		X				Number of pamphlets distributed
Westmount	Continue to limit and control invasive plants at the parc du bois Summit	2012: Control invasive species (*Rhamnus cathartica*) 2015: Prepare an inventory of invasive plants in the parc du bois Summit 2016: Roll out a program to eradicate the invasive plants detected	X	X		X	Inventory of invasive plants Program to eradicate invasive plants

BRIEF 2.1

Adaptation measures for heavy rainfalls

HARVEST RAINWATER

Benefits

- Helps slow down stormwater runoff
- Helps a good percentage of stormwater soak into the ground
- Helps prevent or reduce flooding and sewer backflows during heavy rainfalls
- Helps reduce the frequency and volume of combined sewer system overflows
- Helps protect water quality and aquatic ecosystems (watercourses) by controlling compromised water quality due to release during rainy weather (combined or stormwater sewer system overflows)

Why?

During heavy rainfalls, the temporary retention of rainwater can help prevent runoff and sewer system overloads. Strategies for harvesting rainwater are part of sustainable management practices in order to curtail the impacts of urbanization (surface mineralization) and improve the effectiveness of the public infrastructures already in place.

Constraints and maladaptation risks

- Water leakage toward foundations can lead to a reduction of their bearing capacity and accelerated deterioration during freezing weather.
- Water infiltration that contains de-icing salts can cause premature deterioration of underground infrastructures.
- Green infrastructures require maintenance, and therefore entail changes to maintenance practices.
- The capacity of underlying soils to soak up water is sometimes limited (clay soils).
- Rainwater harvesting from roofs must respect technical constraints.
- Designs must allow us to prevent the creation of temporary ponds that could encourage the growth of mosquito larvae that are vectors for diseases such as the West Nile Virus.

What we can do

Any approach must aim to catch rainwater at the source, hold the water on site and let it trickle out more slowly. This includes the use of landscaping strategies and stormwater management measures:

- Adopt zoning and subdivision regulations relative to rainwater harvesting for sealed surfaces within various plans:
  - Site planning and architectural integration program (SPAIP, or Plans d'implantation et d'intégration architecturale (PIIA))
  - Individual construction plans
  - General urban plans
  - Agreements relative to municipal works
- Direct runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable lands over short periods of time during intense rain (parks, soccer fields, road segments)
- Encourage optimal management practices that would allow rainwater to soak into the soil or to be harvested (ex.: green roofs, gardens and rain barrels, retention basins, etc.) instead of directing runoff water toward the pipe network
  - Remove downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead
- Make regulatory changes for urban planning in general as well as in the way parking lots are built
- Increase the use of continuous tree trenches
- Encourage the use of plants with different kinds of root systems in phytotechnology projects

Potential co-benefits

- Preserves biodiversity and improves living environment
- Reduces sewer overloads downstream and protects the integrity of watercourses
- Helps refill the water table and base flow rates for watercourses
- Under some conditions, may contribute to reducing problems associated with the drying of clay soils
- Reduces water treatment costs

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Direction générale – Division du développement durable (headquarters – sustainable development division)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 20**: Favour the collection, retention and ground-seepage of rainwater at the source **Action 21**: Prevent and correct cross-connections that contaminate the stormwater sewer system	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Reduce the risks associated with the impacts of climate change **Objectives**: Reduce the quantity and improve the quality of runoff water	X	
Service de l'eau (water department)	Stratégie montréalaise de l'eau 2011-2020 (Montréal water strategy 2011-2020 – in French only)	Harmonization of the regulations on retaining rainwater on private lots – Bylaw C-1.1 on the channeling of drinking water, wastewater and stormwater Guides on the role of green infrastructures and the construction of retention basins	X	
Service de l'environnement (environment department)	Aquatic environment monitoring program (programme de suivi du milieu aquatique)	**PLUVIO program**: evaluates the quality in stormwater sewer systems	X	
Service des infrastructures, de la voirie et des transports (infrastructure, roads and transportation department)	Guide d'aménagement durable des rues de Montréal (2013) (Montréal sustainable street construction guide (2013) – in French only)	**Orientation**: Practice responsible resource management **Objectives**: Favour the collection, retention and ground-seepage of rainwater at the source Rainwater and runoff water management measures and a monitoring process are proposed using a series of technical briefs	X	

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Raise awareness among citizens about best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins)	Included in zoning Bylaw 01-274 Include this measure in the activities of our partner, Ville en vert		X		X	Number of permits issued for new projects Checking of activities with Ville en vert in relation to these practices
Ahuntsic-Cartierville	Choose to drain runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as retention basins for short periods of time during intense rainfalls (parks, street sections)	Use this type of construction when possible within our projects		X	X		Number of projects
Ahuntsic-Cartierville	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Use this type of construction when possible within our projects Place recycling bins in our community gardens		X	X		Number of projects for which best management practices are applied
Ahuntsic-Cartierville	Increase the use of continuous tree trenches when planting trees	Catch runoff water in public tree trenches		X			Number of projects
Ahuntsic-Cartierville	Apply Bylaw C-1.1 on the channeling of drinking water, wastewater and stormwater (including stormwater retention criteria for all sealed surfaces exceeding 1,000 m^2)			X			Frequency of inspections
Anjou	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Bring internal bylaws in line with Bylaw C-1.1				X	Retention capacity in cubic metres (m^3)
Anjou	Promote bioretention projects as part of our projects	Objective: 250 m^3 of retention				X	Number of m^3 of retention
Anjou	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Sell rain barrels and change to bylaw				X	Number of projects for which best management practices are applied

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Anjou	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	The borough is evaluating a possible zoning bylaw change to require permeable materials. It is also evaluating the possibility of encouraging the channeling of rainwater toward permeable surfaces in residential areas. Awareness-raising work is taking place in parallel in order to encourage the installation of rainwater catchers in residential areas				X	Number of buildings for which downspouts have been disconnected
Anjou	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Include BNQ standard 3019-190 in the appropriate provisions in the current zoning bylaw				X	Change the bylaw
Anjou	Increase the use of continuous tree trenches	The borough dug trenches everywhere that it was physically possible to do so. For future landscaping, trenches will be included when space permits	X				Number of trenches dug
Baie-D'Urfé	Promote the collection/retention and soil seepage of rainwater and snow melt water at the source	Regulation standards on soil permeability in effect		X			Issuance of permits
Beaconsfield	Stormwater system management as part of land developments is done by digging trenches on both sides of the road on about 90% of the network	Maintain continuous trenches		X			Number of trenches
Beaconsfield	As part of zoning bylaws, include rules stipulating that parking spaces for shopping centres must be equipped with a stormwater drainage system and a bioretention system in the form of vegetated filter strips		X				Retention capacity in cubic metres (m^3)
Beaconsfield	Subsidize the purchase of rainwater barrels for citizens who want to do their part			X			Number of barrels purchased
Côte-des-Neiges–Notre-Dame-de-Grâce	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Respect the clauses of Bylaw C-1.1 for all projects exceeding 1,000 m^2 of sealed surface	X				Number of projects

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-des-Neiges–Notre-Dame-de-Grâce	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Raise awareness via the ecocentre Adopt regulations				X	Number of projects for which best management practices are applied
Côte-des-Neiges–Notre-Dame-de-Grâce	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Change the zoning bylaw: For ICI (institutional, commercial and industrial spaces) only, adopt a bylaw inspired by BNQ standard 3019-190 on controlling heat islands, which requires, among other things, that for a parking lot of 20 spaces or more, 40% of the lot's surface must be covered by a canopy				X	Adoption of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Construction in the Le Triangle area (Décarie, Buchan, Jean-Talon Ouest): stormwater retention basins built into the streets will make it possible to filter stormwater more naturally			X		Number of projects for which best management practices are applied
Côte-des-Neiges–Notre-Dame-de-Grâce	Runoff water recuperation or bioretention measures for all new parking lots	Examine the regulatory provisions that could be adjusted in order to require runoff water recuperation or bioretention measures for any parking lot of 20 spots or more intended for commercial, industrial or institutional use	X				Retention capacity in cubic metres (m^3)
Côte-des-Neiges–Notre-Dame-de-Grâce	Develop new residential and industrial sites that include retention and bioretention systems when possible	Include in exceptional measures (specific projects or others) criteria aiming to include retention and bioretention systems	X				Retention capacity in cubic metres (m^3)
Côte-des-Neiges–Notre-Dame-de-Grâce	Favour the adoption of a bylaw for new constructions in order to encourage the catching, retention and soil-seepage of rainwater					X	Retention capacity in cubic metres (m^3)
Côte-des-Neiges–Notre-Dame-de-Grâce	Sale of rainwater barrels by Éco-quartiers	Boost the number of barrels sold per year by 10%		X			Number of barrels sold

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-Saint-Luc	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Project: floodable basin at the snow disposal site Number of projects: 1				X	Number of projects
Côte-Saint-Luc	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Article 32 of the Environment Quality Act = two retention basin projects in place (new constructions + 20 housing units)		X			Retention capacity
Côte-Saint-Luc	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	One project under construction (Parkhaven X Kildare) + one planned (Mackle X Westminster)		X		X	Number of projects for which best management practices are applied
Dollard-Des Ormeaux	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Adopt the bylaw				X	Adoption of the bylaw
Dollard-Des Ormeaux	Favour best management practices for stormwater (rain gardens, rain barrels, permeable pavement, retention basins, etc.) in land planing					X	Number of projects for which best management practices are applied
Dollard-Des Ormeaux	The city encourages the use of rainwater barrels through a program with Éco-quartier		X				Number of barrels used
Dollard-Des Ormeaux	All coverings on properties other than single-family homes must keep stormwater on the property and must use an underground drainage system to evacuate water		X				
Dollard-Des Ormeaux	Apply the retention of maximum 15 l/sec/ha (litre per second per hectare) for all new and expanded sealed surfaces measuring 100 m^2 or more	Bylaw R-2014-084		X			Application of the bylaw

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dollard-Des Ormeaux	Regulate the removal of downspouts that spill into the sewers and channel rainwater toward permeable surfaces	The application of the bylaw is underway		X			Application of the bylaw
Dollard-Des Ormeaux	Apply Bylaw 2014-084 – Chapter 6 on water retention	15 l/sec/ha for all new or expanded sealed surfaces measuring over 100 m^2		X			Application of the bylaw
Dorval	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)			X		X	Number of projects
Dorval	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)			X		X	Retention capacity in cubic metres (m^3)
Dorval	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning			X		X	Number of projects for which best management practices are applied
Dorval	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw
Kirkland	Maintain existing green infrastructures for collecting, retaining and soil seepage, and build new ones	Maintain existing structures and, as needed, build new green infrastructures for collection/ retention/soil seepage		X			Number of projects
Kirkland	Create a subsidy program for citizens to buy rainwater barrels	Continue the program Sell 100 barrels by 2020		X		X	Number of barrels sold
Kirkland	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Respect the clauses of Bylaw C-1.1 for all projects exceeding 1,000 m^2 of sealed surface		X			Retention capacity in cubic metres (m^3)

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Kirkland	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Construct three best management practice projects by 2020				X	Number of projects for which best management practices are applied
Kirkland	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	Remove 50 downspouts by 2020				X	Number of buildings for which downspouts have been disconnected
Kirkland	Raise awareness among businesspeople and the population about the sustainable construction of parking lots – BNQ standard 3019-190 to control heat islands	Systematically educate each person or business that wishes to construct a parking lot				X	Number of people reached
Lachine	Apply water retention techniques when revamping boulevards, particularly by lowering the median strips between the two lanes and planting wetland plant species that may help retain and filter water before it runs toward catch basins				X		Retention capacity in cubic metres (m^3)
Lachine	Enforce the prohibition on channeling downspouts toward stormwater sewers	Apply the bylaw to new constructions		X			Application of the bylaw
Lachine	Maintain the regulatory obligation that stipulates that all new buildings with a sealed surface of more than 1,000 m^2 must include rainwater collection and retention structures	Apply bylaw C-1.1		X			Application of the bylaw
Lachine	Raise awareness among citizens about the eco-friendly management of rainwater (ex.: using rainwater collection barrels)	Disseminate information by GRAME (Groupe de recherche appliquée en macroécologie) via their website, Facebook page and newsletter Distribute 250 rainwater collection barrels	X				Website Number of barrels distributed

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Increase tree and plant cover	Plant 400 trees and 285 shrubs on streets, schoolyards and industrial buildings through the IUR Airlie Bayne (Programme de revitalisation urbaine intégrée, or integrated urban revitalization program)	X				Number of trees
LaSalle	Reduce paved surfaces when reconstructing roads; create grassy areas and plant trees	Example: rue John-Cambell		X			Square metres (m^2) Number of trees
LaSalle	Reduce paved surfaces when reconstructing roads and channel runoff water toward the grass before it reaches a sump			X			Square metres (m^2)
LaSalle	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	When revamping parks and roads, one project per year			X		Number of projects
LaSalle	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)			X			Retention capacity in cubic metres (m^3)
LaSalle	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning			X			Number of projects for which best management practices are applied
LaSalle	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	Revise the bylaw				X	Number of buildings for which downspouts have been disconnected
LaSalle	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Revise the bylaw				X	Adoption of the bylaw

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Increase the use of continuous tree trenches	When possible in new projects or road reconstructions				X	Number of continuous tree trenches dug
Le Plateau-Mont-Royal	Choose set-ups that channel runoff water toward curb extensions	Five projects				X	Number of projects
Le Plateau-Mont-Royal	Use of greening spaces for rainwater soil seepage (topographical planning of sidewalks to prevent rainwater from draining toward curb extensions)	Four projects				X	Number of projects
Le Plateau-Mont-Royal	Propose a change to the urban planning bylaw aiming to control urban heat islands and improve rainwater percolation - Regulate the sustainable construction of parking lots - Require tree planting	Adopt and apply the bylaw				X	Number of trees planted
Le Plateau-Mont-Royal	Favour the use of continuous tree trenches	Dig at least one continuous tree trench (per sidewalk) in order to help root systems to spread				X	Number of continuous tree trenches dug
Le Plateau-Mont-Royal	Harvest rainwater in community gardens to water plants	Create a rainwater harvesting program for one of the community gardens and reuse water for watering plants in the plots				X	Number of projects
Le Plateau-Mont-Royal	Plant beds of vegetables with the day camps	Each year, plant five beds of edible plants with the day camps				X	Number of beds planted
Le Sud-Ouest	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	One or two projects per year for the next five years			X	X	Number of projects
Le Sud-Ouest	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Include C-1.1 in project designs where it applies		X		X	Number of projects Retention capacity in cubic metres (m^3)

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BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Include the practices in project designs		X		X	Number of projects for which best management practices are applied
Le Sud-Ouest	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	Apply for each renovation of municipal buildings				X	Number of municipal facilities for which downspouts have been disconnected
Le Sud-Ouest	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Analyze the regulations				X	Changes to regulations if necessary
Le Sud-Ouest	Increase the use of continuous tree trenches	Four or five per year				X	Number of continuous tree trenches dug
Le Sud-Ouest	Construct water retention basins	Construct a planted retention basin on the street on promenade Smith. Splash pads will be linked to the retention basin for plant watering and street cleaning		X			Number of splash pads linked to the retention basin
Le Sud-Ouest	Apply the bylaw on stormwater retention (Bylaw C-1.1)	Projects for the Bassins du Nouveau Havre: stormwater treatment using an infiltration basin	X				Retention capacity in frequency of rainfalls
Le Sud-Ouest	Dig continuous tree trenches	Dig continuous tree trenches where applicable		X			Number of continuous tree trenches dug
L'Île-Bizard–Sainte-Geneviève	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Underway in construction projects		X			Retention capacity in cubic metres (m^3)
L'Île-Bizard–Sainte-Geneviève	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Initiate the process				X	Number of projects for which best management practices are applied

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
L'Île-Bizard–Sainte-Geneviève	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	Recommend in all projects		X			Number of buildings for which downspouts have been disconnected
Mercier–Hochelaga-Maisonneuve	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Two projects carried out: – Longue-Pointe industrial spur – retention basin for the cours La Fontaine	X				Number of projects
Mercier–Hochelaga-Maisonneuve	Increase the use of continuous tree trenches	Carry out a project on rue Viau in the Quartier vert (green neighbourhood)	X				Number of continuous tree trenches dug
Mercier–Hochelaga-Maisonneuve	Create rainwater harvesting programs			X			
Montréal-Est	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Change Bylaw 765, which governs land drainage and the method of linking sewers from private properties to municipal sewers, to include standards for the drainage of sealed surfaces of more than 1,000 m^2 As much as possible, follow the BNQ's standards on the sustainable construction of parking lots for drainage using moisture-loving plants					Retention capacity in cubic metres (m^3)
Montréal-Est	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	For new constructions and renovations, equip ourselves with a bylaw favouring best stormwater management practices				X	Number of projects for which best management practices are applied
Montréal-Est	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	For new constructions and renovation projects, equip ourselves with a bylaw requiring institutional, commercial and industrial entities to re-route roof water away from the sewers and toward planted areas (moisture-loving plants)				X	Number of buildings for which downspouts have been disconnected

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Est	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	For ICIs (industrial, commercial and institutional establishments) only, adopt a bylaw based on BNQ standard 3019-190 to control heat islands, which would require, for a parking lot of 20 or more spaces: – that 40% of the parking lot's surface be covered by a canopy; – that the minimum size of a space be reduced to 2.60 x 5.75 metres; – that, above 125% of the minimum number of parking spaces, the spaces must be underground or part of a multi-level parking garage				X	Adoption of the bylaw
Montréal-Est	Increase the use of continuous tree trenches	For each renovation project, impose this approach whenever possible				X	Number of continuous tree trenches dug
Montréal-Nord	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Provision already included in the borough's zoning bylaw for the area of boulevard Pie-IX				X	Number of projects
Montréal-Nord	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Existing bylaw already being applied				X	Retention capacity in cubic metres (m^3)
Montréal-Nord	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Existing bylaw already being applied				X	Number of projects for which best management practices are applied
Montréal-Nord	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	Provide information to citizens when construction requiring a permit is being done				X	Number of buildings for which downspouts have been disconnected
Montréal-Nord	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Study for inclusion in our urban planning bylaw				X	Adoption of the bylaw

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Nord	Increase the use of continuous tree trenches					X	Number of continuous tree trenches dug
Mont-Royal	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Increase the number of rainwater barrels				X	Number of projects for which best management practices are applied
Mont-Royal	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	The application of the bylaw is underway		X			Adoption of the bylaw
Mont-Royal	Increase the use of continuous tree trenches	Increase the number of trenches				X	Number of continuous tree trenches dug
Mont-Royal	Subsidize the purchase of rainwater barrels in order to reduce the use of drinking water for watering gardens			X			Number of barrels purchased
Outremont	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Construct floodable basins in the parks of the future Outremont campus				X	Number of projects: 1
Outremont	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Application planned according to the zone set out in Bylaw 06.069				X	Number of projects: 1
Outremont	Increase the use of continuous tree trenches	Landscape avenue Laurier			X		Number of trenches: 2
Pierrefonds-Roxboro	Include green infrastructures for collecting, retaining and seepage water (including wetlands) in our own landscaping projects, including on one street	Apply the program in new developments		X			Retention capacity in cubic metres (m^3)

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pierrefonds-Roxboro	Create rainwater harvesting programs	Distribute reduced-price barrels	X				Number of barrels distributed
Pierrefonds-Roxboro	Retain water in order to refill the water table	Manage runoff water		X			Square metres (m^2) of reduction of sealed surfaces
Pointe-Claire	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Harvest rainwater		X			Number of projects for which best management practices are applied
Pointe-Claire	Regulate the sustainable construction of parking lots	Analyze the regulations and changes to them if necessary			X		Adoption of the bylaw
Pointe-Claire	Develop new residential and industrial sites while including retention systems in them when possible	Include criteria regarding the maximum waste flow in all new constructions		X			Number of new projects
Pointe-Claire	Continue to use rainwater collection and retention reservoirs at the public works building (water reused to water the grass and plants)	Harvest rainwater		X			Number of barrels of rain used per year
Rivière-des-Prairies–Pointe-aux-Trembles	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	For all projects whose area and environment permit				X	Number of projects
Rivière-des-Prairies–Pointe-aux-Trembles	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Apply the bylaw		X			Retention capacity in cubic metres (m^3)
Rivière-des-Prairies–Pointe-aux-Trembles	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	For all relevant projects				X	Number of projects for which best management practices are applied

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rivière-des-Prairies–Pointe-aux-Trembles	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Change the zoning bylaw				X	Adoption of the bylaw
Rivière-des-Prairies–Pointe-aux-Trembles	Increase the use of continuous tree trenches	In all cases where budget permits		X			Number of continuous tree trenches dug
Rivière-des-Prairies–Pointe-aux-Trembles	Progressively revise the regulation in order to include elements that contribute to the collection, retention and seepage of rainwater at the source	Regulation revision underway			X		Bylaw revised and adopted
Rivière-des-Prairies–Pointe-aux-Trembles	Include green infrastructures for collecting, retaining and seeping rainwater (including wetlands) in residential development projects on rue Sherbrooke and 81e Avenue	Construction planned: fall 2015			X		Retention and seepage measures implemented
Rivière-des-Prairies–Pointe-aux-Trembles	Include green infrastructures for collecting rainwater in residential development projects Le Faubourg Pointe-aux-Prairies and Le projet du golf de Montréal (Montréal golf project)	Faubourg Pointe-aux-Prairies is 50-60% completed and the Montréal golf project will be in 2016-2017			X		Retention capacity in cubic metres (m^3)
Sainte-Anne-de-Bellevue	Encourage the use of rainwater barrels by raising awareness and selling barrels at a discount	Measure included in the environment and sustainable development policy (reduce water demand by 15% among residents, institutions, businesses and industries compared to 2012)				X	Number of barrels sold
Saint-Laurent	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Adopted, in 2009, an action plan for stormwater and sewer backflow management	X				Number of projects for which best management practices are applied
Saint-Laurent	Develop new residential and industrial sites while including retention and bioretention systems when possible	Improve performance in order to handle runoff water management problems		X			Retention capacity in cubic metres (m^3)

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Distribute rainwater harvesting barrels to residents			X			Number of barrels distributed
Saint-Laurent	Evaluate the feasibility of putting rainwater collection and retention reservoirs into place in some parks and green strips	Done for the following parks: Houde, Gohier, Beaulac, Saint-Laurent, Philippe-Laheurte. The water is reused to water grass and plants	X				Retention capacity in cubic metres (m^3)
Saint-Laurent	Measure the effectiveness and functioning of underground retention basins	Installed, in 2010, a range-finding system in underground retention basins to measure their effectiveness and functioning	X				Retention capacity of underground basins in cubic metres (m^3)
Saint-Laurent	Install a range-finding system in open-air stormwater retention basins in Nouveau Saint-Laurent	The borough is currently preparing plans and specifications for installing the range-finding system			X		Number of range-finding systems installed
Saint-Laurent	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Include bioretention principles in development agreements while waiting for Montréal's bylaw on standardized retention to be adopted		X			Number of projects
Saint-Laurent	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Apply Bylaw 1047 on retention specific to Saint-Laurent, while waiting for Montréal's bylaw on standardized retention to be adopted		X			Retention capacity in cubic metres (m^3)
Saint-Laurent	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Include bioretention principles in development agreements while waiting for Montréal's bylaw on standardized retention to be adopted. Until then, depart from Bylaw 1047 by adopting a resolution		X		X	Number of projects for which best management practices are applied
Saint-Laurent	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	Bylaw 1047 prohibits hooking up downspouts to the sewer system; ensure that it is applied		X			Number of buildings for which downspouts have been disconnected

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Strengthen existing standards relative to parking Adopt Bylaw RCA08-08-0001-78 in 2015				X	Adoption of the bylaw
Saint-Léonard	Through the Éco-quartier, promote the sale of rainwater harvesting barrels	Promote and disseminate in community gardens – herb garden		X			Number of barrels sold
Saint-Léonard	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Install a retention basin at parc Garibaldi	X			X	Number of projects
Saint-Léonard	Disconnect downspouts that channel water into the sewers and direct rainwater toward permeable surfaces instead	Conduct an awareness-raising campaign Favour in new projects Analyze the possibility of changing regulations				X	Number of buildings for which downspouts have been disconnected
Saint-Léonard	Carry out an analysis of regulations on the sustainable construction of parking spaces for industrial, commercial and institutional establishments	Carry out an analysis of regulations			X		Analysis report
Saint-Léonard	Increase the use of continuous tree trenches	Dig continuous tree trenches				X	Number of continuous tree trenches dug
Senneville	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning					X	

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Verdun	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Build drainage channels or trenches toward the St. Lawrence River or toward temporary floodable basins when constructing municipal projects		X			Number of projects
Verdun	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Apply Bylaw C-1.1		X			Retention capacity in cubic metres (m^3)
Verdun	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Adopt the bylaw and apply it				X	Adoption of the bylaw
Verdun	Increase the use of continuous tree trenches	Incorporate specifications into plans and specifications Apply starting in 2015 for all projects that permit	X				Number of continuous tree trenches dug
Ville-Marie	Include measures to reduce runoff water in road reconstruction projects		X				
Ville-Marie	Implement rainwater harvesting programs					X	
Ville-Marie	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Landscaping work for Quartier 21 Peter-McGill: – Perform urban landscaping of the Saint-Mathieu and Sainte-Catherine alleys with rainwater redirection – Add tree squares and planted curb extensions equipped with rain gardens with retention capacity on rue Saint-Mathieu, rue Saint-Marc and boulevard de Maisonneuve Ouest	X				Number of projects for which best management practices are applied
Ville-Marie	Implement tree protection and maintenance measures		X				Number of trees maintained

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ville-Marie	Plant trees for each non-built section of 150 m^2		X				Number of trees planted
Ville-Marie	Quartier vert (green neighbourhood) PPU Sainte-Marie (special planning program)			X			
Villeray–Saint-Michel–Parc-Extension	Channel runoff water toward wetlands or watercourses, as well as toward public infrastructures that could serve as floodable basins for short periods of time during intense rainfalls (parks, soccer fields, road sections)	Include measure in new projects (construct a retention basin on the grounds of the aréna Saint-Michel)			X		Number of projects
Villeray–Saint-Michel–Parc-Extension	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Apply bylaw		X			Retention capacity in cubic metres (m^3)
Villeray–Saint-Michel–Parc-Extension	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Can be required as part of project analysis under the bylaw on special building, renovation, alteration or occupancy projects			X		Number of projects for which best management practices are applied
Villeray–Saint-Michel–Parc-Extension	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Apply Bylaw 01 283-75		X			Adoption of the bylaw
Villeray–Saint-Michel–Parc-Extension	Increase the use of continuous tree trenches	Include measure when completely rebuilding a street			X		Number of continuous tree trenches dug
Villeray–Saint-Michel–Parc-Extension	Harvest rainwater from an arena roof and use it for ice resurfacing	Planned for 2015			X		Water volume harvested in cubic metres (m^3)
Westmount	Apply stormwater retention for all sealed surfaces exceeding 1,000 m^2 (Bylaw C-1.1)	Follow the stormwater management plan in the *Guide #6 aménagement paysager du règlement 1305* (guide #6 on landscaping for Bylaw 1305) (site planning and architectural integration program (SPAIP))	X				Retention capacity in cubic metres (m^3)

Adaptation measures for heavy rainfalls: Harvest rainwater

BRIEF 2.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Westmount	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning		X				Number of projects for which best management practices are applied
Westmount	Increase the use of continuous tree trenches	Avenue Greene (approx. 30 trees)	X	X			Number of continuous tree trenches dug
Westmount	As much as possible, create bioretention areas in parks, central medians and other public spaces in areas where chronic sewer problems occur	First area installed at the recreation centre in 2013 Second planned for 2015 across from the municipal conservatory	X		X		Number of bioretention areas created
Westmount	Examine the possibility of installing devices to slow high water flow or rain flow in sewers during storms	Under study			X		
Westmount	Try out innovative methods for catching rainwater so it does not run into the sewer system	Water management plan in the *Guide #6 aménagement paysager du règlement 1305* (guide #6 on landscaping for Bylaw 1305) (site planning and architectural integration program (SPAIP)): under study to see where it is possible to implement such methods			X		
Westmount	Implement downspout disconnection program		X				
Westmount	Subsidize the sale of rain barrels (finance, public works)					X	Number of barrels sold
Westmount	Evaluate the need for and feasibility of using oil and dust interceptors and other best management practices for rainwater					X	

BRIEF 2.2

Adaptation measures for heavy rainfalls

INCREASE INFRASTRUCTURES' AND BUILDINGS' RESILIENCE TO RUNOFF WATER

Benefits

- Helps reduce flooding in buildings due to leakage, runoff water or sewer backflows
- Helps reduce damage to buildings

Potential co-benefits

- Savings: With buildings that are more resilient to heavy rainfalls, insurance premiums won't go up, the home's market value does not go down, and there are no costs related to destroyed goods or post-flood cleaning
- Health: Prevents the growth of mould and related health problems. Reduces the risk of gastrointestinal disease due to contact with wastewater. Reduces the risk of distress trauma
- Reduces the risk of electrocution and carbon monoxide poisoning (in relation to the use of gas-powered pressure washers for cleaning damaged basements)

Why?

The risk of flooding due to leakage, runoff water or sewer backflow during heavy rainfalls particularly affects certain buildings. These may be buildings located in pit slope areas, but also those that are built with inadequate ground levelling (ex.: water discharge or a downward slope leading to the garage entrance). When extra water is directed toward these buildings, it can damage their foundations and finished basements.

As for road network infrastructures, overpasses and interchanges are more affected during heavy rainfalls due to the strong flow of runoff water. In some cases, they may even be flooded.

What we can do

- Install and maintain various devices and pieces of equipment that reduce the risk of flooding, such as backwater valves, basement window wells and foundation drains
- Construct buildings and infrastructures in a way that is coherent with the territory's topography and morphology
- Periodically monitor road infrastructures, particularly bridges and culverts, and take the necessary measures when deficiencies are found

Constraints and maladaptation risks

- Costs can be prohibitive when it comes to correcting existing constructions where a downward slope leads to the garage entrance.

Adaptation measures for heavy rainfalls: Increase infrastructures' and buildings' resilience to runoff water

BRIEF 2.2

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la gestion et de la planification immobilière (property planning and management department)	Building standards / standardized specifications	Include criteria relative to climate change adaptation in standardized documents		X
Service de la mise en valeur du territoire (territory enhancement department)	Plan d'action lutte à l'insalubrité des logements 2014-2017 (action plan to fight poor housing 2014-2017 – in French only)	1. Complete the development of a diagnostic tool for mould 2. Grow synergy with the Direction de santé publique (public health department) of the Agence de la santé et des services sociaux de Montréal (Montréal health and social services agency), particularly in regard to mould issues 3. Research innovative means of detecting situations likely to foster mould development (insurer disclosure directory, specialized businesspeople, etc.) 4. Inform owners and renters about the dangers of mould and inform them about prevention and correction methods	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Reduce the risks associated with the impacts of climate change **Objective**: Reduce the quantity and improve the quality of runoff water. The Schéma asks that we consider topography and the sewer system's functioning in order to determine areas of constraint where the regulations must govern the affected usages and define building forms that provide immunity against basement floods	X	
Service de l'eau (water department)	Stratégie montréalaise de l'eau 2011-2020 (Montréal water strategy 2011-2020 – in French only)	Study evaluating the vulnerability of the combined sewer system according to the Engineers Canada protocol	X	
Service de l'eau (water department)	Bylaw 11-010 on protecting buildings against sewer backflows	This bylaw aims to establish criteria in order to protect buildings against sewer backflows by installing and maintaining plumbing devices and equipment, particularly backwater valves	X	
Service des infrastructures, de la voirie et des transports (infrastructure, roads and transportation department)	Annual structure inspection program	Rigorous annual inspection process for all the city's structures (including bridges and culverts)	X	

Adaptation measures for heavy rainfalls: Increase infrastructures' and buildings' resilience to runoff water

BRIEF 2.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Adopt and apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010		X				Adoption of the bylaw
Ahuntsic-Cartierville	Disseminate information to citizens about protecting buildings against sewer backflows	Online information brief about permits	X				Number of citizens reached
Anjou	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Done by the building inspector		X			Number of buildings where backwater valves have been installed
Anjou	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: disseminate information about protecting buildings against sewer backflows	The borough inspector must ensure that each owner visited is properly informed about the non-compliance issues on their property, exposing them to flood or sewer backflow risks. Follow up will be done with citizens to evaluate the rate of corrective works		X			Number of inspections of backwater valves
Baie-D'Urfé	Disseminate information on protecting buildings against runoff water leakages	Remind residents of the municipal regulations with a memo				X	Types of dissemination
Côte-des-Neiges–Notre-Dame-de-Grâce	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Application of the bylaw–done by our inspectors	X				Number of buildings where backwater valves have been installed
Côte-des-Neiges–Notre-Dame-de-Grâce	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach	Inform owners through a pamphlet about the program available at the permit counter			X		Number of inspections of backwater valves
Côte-des-Neiges–Notre-Dame-de-Grâce	Renovate several sports fields to ensure better drainage and avoid any interruption of the activity schedule	Renovate several soccer and baseball fields		X			Number of hours of interruption Number of fields renovated
Côte-Saint-Luc	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	All built after 1952: Article 7-10-7 Bylaw 2088 (1991)		X			Number of buildings where backwater valves have been installed

Adaptation measures for heavy rainfalls: Increase infrastructures' and buildings' resilience to runoff water

BRIEF 2.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-Saint-Luc	Periodically monitor the state of bridges and culverts (erosion indicators, obstructions to the flow of watercourses, structural integrity, etc.)	Overpass inspection program Latest inspections: – Chemin de la Côte-Saint-Luc overpass (2011 and 2012) – Boulevard Cavendish overpass (2012) – Westminster (2012 and 2015)	X				Frequency of inspections
Dollard-Des Ormeaux	Apply the regulation on protecting buildings against sewer backflows (specifically, installing backwater valves)					X	Number of buildings where backwater valves have been installed
Dollard-Des Ormeaux	Promote the Protégez-vous contre les infiltrations d'eau (protect yourself against water leakage) program					X	Number of sloped car ramps with a higher elevation
Dollard-Des Ormeaux	No outdoor entrance or outdoor access ramp can be built on a private property with a slope of over 12%	Bylaw in effect		X			Application of the bylaw
Dollard-Des Ormeaux	Outdoor access ramps for vehicles, single-family homes or townhouses located on individual lots may not be built with a slope that goes below the final elevation of the top of the pavement along the central line	Bylaw in effect		X			Application of the bylaw
Dorval	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)			X		X	Number of buildings where backwater valves have been installed
Kirkland	Disseminate information to citizens about protecting buildings against sewer backflows	Continue to distribute pamphlets and educate each person doing plumbing work		X			Number of citizens met
Kirkland	Perform periodic monitoring of the state of bridges and culverts	Continue to inspect bridges and culverts annually		X			Number of annual inspections

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Kirkland	Adapt the urban planning bylaw to be more in line with topography and system functioning	Change the urban planning bylaws based on topography and system functioning by 2020				X	Regulatory changes
LaSalle	Install backwater valves					X	Unit
LaSalle	Clean sewer manholes	Clean every three years		X			Unit
LaSalle	Apply the bylaw for new and existing buildings on protection against sewer backflows	Apply the bylaw		X			Annual report
LaSalle	Apply the bylaw on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Application of the regulation in effect		X			Number of buildings where backwater valves have been installed
LaSalle	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows			X			Number of inspections of backwater valves
LaSalle	Periodically monitor the state of bridges and culverts (erosion indicators, obstructions to the flow of watercourses, structural integrity, etc.)	Check culverts every three years Bridges are inspected by the central city		X			Frequency of inspections
LaSalle	Adapt urban planning or zoning regulations to be more in line with topography and network functioning (ex.: no garages at the bottom of a slope in pit slope areas)	Revise the bylaw				X	Adoption of the bylaw
Le Sud-Ouest	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Apply the bylaw		X			Number of buildings where backwater valves have been installed

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	Disseminate information on the program				X	Availability of information
Le Sud-Ouest	Implement Bylaw 11-010 on protecting buildings against sewer backflows		X				Follow up on request processing
Le Sud-Ouest	Apply the new regulation on the channeling of drinking water, wastewater and stormwater in all new constructions and renovations	Apply Bylaw C-1.1	X				Not applicable
L'Île-Bizard–Sainte-Geneviève	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Apply for all new constructions		X			Number of buildings where backwater valves have been installed/number of backwater valves
Mercier–Hochelaga-Maisonneuve	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	One inspector assigned to applying the bylaw		X			Number of buildings where backwater valves have been installed
Mercier–Hochelaga-Maisonneuve	Put into place the Protégez-vous! (Protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	One inspector available to inform citizens about the program in collaboration with the Direction de la gestion stratégique des réseaux d'eau (DGRSE) (strategic water network management department)		X			Number of inspections of backwater valves
Montréal-Est	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Bylaw requiring the installation of a backwater valve		X			Number of buildings where backwater valves have been installed
Montréal-Est	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	Raise awareness among citizens				X	Number of inspections of backwater valves

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Est	Periodically monitor the state of bridges and culverts (erosion indicators, obstructions to the flow of watercourses, structural integrity, etc.)	Establish a monitoring plan				X	Frequency of inspections
Montréal-Nord	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)					X	Number of buildings where backwater valves have been installed
Montréal-Nord	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows					X	Number of inspections of backwater valves
Montréal-Nord	Periodically monitor the state of bridges and culverts (erosion indicators, obstructions to the flow of watercourses, structural integrity, etc.)					X	Frequency of inspections
Montréal-Nord	Adapt urban planning or zoning regulations to be more in line with topography and network functioning (ex.: no garages at the bottom of a slope in pit slope areas)					X	Frequency of inspections
Montréal-Ouest	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	All new constructions and major repair projects must have a discharge valve installed		X			Number of buildings where backwater valves have been installed
Montréal-Ouest	Periodically monitor the state of bridges and culverts (erosion indicators, obstructions to the flow of watercourses, structural integrity, etc.)	Periodic inspection (every five years)		X			Frequency of inspections
Montréal-Ouest	Implement Bylaw 11-010 on protecting buildings against sewer backflows	Bylaw in effect	X				Follow up on request processing

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mont-Royal	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Bylaw in effect		X			Number of buildings where backwater valves have been installed
Mont-Royal	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	Program in place		X			Number of inspections of backwater valves
Mont-Royal	Sewer system maintenance funded by the provincial government			X			Kilometres (km) of sewers maintained
Mont-Royal	Implement 22-1/2-inch sewer grates, water retention in the street			X			
Mont-Royal	Maintain roof drains			X			
Outremont	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Application of the regulations in effect		X			Number of buildings where backwater valves have been installed
Outremont	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	Disseminate information to citizens about protecting buildings against sewer backflows	X				Number of inspections of backwater valves
Pierrefonds-Roxboro	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Apply the bylaw		X			Number of inspections and corrections
Pierrefonds-Roxboro	Favour best management practices for stormwater (rain gardens, absorbing wells, permeable pavement, valleys, trenches, retention basins) in land planning	Use this type of construction when possible within our projects		X			Number of projects

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pointe-Claire	Apply the regulation on protecting buildings against sewer backflows (specifically, installing backwater valves)	Any linkage with a municipal sanitary, stormwater or combined sewer system must be equipped with a backflow valve or relief valve in order to provent the backflow of sewer water		X			Municipal bylaw (plumbing and drainage standards)
Pointe-Claire	Disseminate information to citizens about protecting buildings against sewer backflows	Raise awareness among citizens about the importance of increasing buildings' resilience to runoff water		X			Number of disseminations on the subject
Pointe-Claire	Clean sewer manholes	Regularly maintain sewer manholes		X			Cleaning frequency
Rivière-des-Prairies–Pointe-aux-Trembles	Apply the regulation on protecting buildings against sewer backflows, Bylaw 11-010, to new constructions	Application of the regulation in effect		X			Installation of devices Correction required for buildings that have experienced sewer backflows
Rivière-des-Prairies–Pointe-aux-Trembles	Adapt urban planning or zoning regulations to be more in line with topography and network functioning (ex.: no garages at the bottom of a slope in pit slope areas)	Change the zoning bylaw				X	Adopt the bylaw
Saint-Laurent	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	Inform owners through a pamphlet about the program available at the permit counter		X			Number of citizens reached
Saint-Laurent	Adapt urban planning or zoning regulations to be more in line with topography and network functioning (ex.: no garages at the bottom of a slope in pit slope areas)	The zoning regulation is already adapted. Ensure that it is applied	X				Frequency of inspections
Saint-Laurent	In 2011, adopted the bylaw on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Require owners to provide a diagram indicating where the devices are installed and check the information		X			Number of buildings where backwater valves have been installed

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Léonard	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Inspect buildings: installation of backwater valves during municipal basement renovations (ex.: the aréna Martin-Brodeur was done, the pool, etc.)			X	X	Number of buildings where backwater valves have been installed
Saint-Léonard	Continue to disseminate information about protecting buildings from sewer backflows	Distribute and make available information pamphlets about sewer backflow control (Direction de l'aménagement urbain et des services aux entreprises – DAUSE (urban planning and business services department), Bureau Accès Montréal (citizen service points) Fête du citoyen (citizen festival)		X		X	Number of pamphlets distributed
Senneville	Periodically monitor the state of bridges and culverts (erosion indicators, obstructions to the flow of watercourses, structural integrity, etc.)					X	Frequency of inspections
Verdun	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Application of the regulation in effect		X			Number of buildings where backwater valves have been installed
Verdun	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	Distribute pamphlets		X			Number of pamphlets distributed
Verdun	Adapt urban planning or zoning regulations to be more in line with topography and network functioning (ex.: no garages at the bottom of a slope in pit slope areas)	Change and apply the bylaw				X	Frequency of inspections
Ville-Marie	Apply the bylaw on channeling drinking water, wastewater and stormwater (C1.1)	Apply the bylaw	X				Number of inspections

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BRIEF 2.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ville-Marie	Protect buildings against sewer backflows	Apply the bylaw on protecting buildings against sewer backflows	X				Number of inspections of backwater valves
Ville-Marie	Require indoor parking lots	Apply the bylaw	X				Number of development projects
Ville-Marie	Take legal action to shut down parking lots operating without authorization	Conduct a legal process jointly with legal affairs		X		X	Redevelopment of sites for residential and commercial purposes
Villeray–Saint-Michel–Parc-Extension	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Apply the regulation		X			Number of buildings where backwater valves have been installed
Villeray–Saint-Michel–Parc-Extension	Put into place the Protégez-vous! (protect yourself!) program or programs with a similar approach: Disseminate information to citizens about protecting buildings against sewer backflows	80 inspections per year		X			Number of inspections
Westmount	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)	Plumbing Bylaw 1368	X				Number of buildings where backwater valves have been installed
Westmount	Adapt urban planning or zoning regulations to be more in line with topography and network functioning (ex.: no garages at the bottom of a slope in pit slope areas)					X	Adaptation of the regulations

Adaptation measures for heavy rainfalls

MINIMIZE SEALED SURFACES

Benefits

- Helps slow down stormwater runoff
- Helps a good percentage of stormwater soak into the ground
- Helps reduce the frequency and volume of combined sewer overflows and reduce the severity of floods during heavy rains

Potential co-benefits

- Mitigates intra-urban heat islands
- Can, under some conditions, help reduce the problems related to the drying out of clay soils
- Helps to improve living environments (presence of plants)

Why?

Urban settings feature the heavy presence of mineralized surfaces (ex.: parking lots, paved streets, buildings). During heavy rainfalls, these sealed surfaces inevitably channel water and many pollutants toward the sewer system, which has limited capacity, and can lead to watercourse overflows during times of frequent rain and to floods during exceptionally heavy rainfalls.

As such, we need to minimize sealed surfaces, which comes down to increasing water's ability to soak directly into the ground, and so reduce runoff water.

What we can do

- Review planning and regulation tools: from the beginning of a project's design, review street widths and minimize parking spaces
- Choose plant-covered surfaces that can soak up rainwater
- Choose permeable surface coverings (porous asphalt or concrete, concrete paving stones and honeycomb stabilizers made of concrete or plastic)

Constraints and maladaptation risks

- Permeable surface coverings (such as honeycombed paving stones) can require special maintenance.
- Water leakage toward foundations can lead to a reduced bearing capacity and accelerated deterioration during freezing weather.
- Water infiltration that contains de-icing salts can lead to the premature deterioration of underground infrastructures.
- Some permeable surface coverings are not suitable for people with reduced mobility.

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la diversité sociale et des sports (social diversity and sport department)	Integrated urban revitalization program (IUR)	IUR Saint-Pierre (Lachine): demineralize the edges of the Saint-Pierre market and create vegetable gardens	X	
Service de la mise en valeur du territoire (territory enhancement department)	Plan d'urbanisme (2004) (urban development plan (2004) – in French only)	**Objective 17**: Employ best management practices for resources in the urban context **Action 17.1**: Support healthier urban planning (this action aims to encourage the reduction of mineralized surfaces and counter the effects of heat islands) **Action 17.3**: Effectively manage drinking water and wastewater infrastructures	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	Section 4.2.2 of the companion document concerns the reduction of heat islands and also deals with the reduction of soil sealing	X	

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Favour demineralization in urban projects	Favour greening in projects and the addition of green infrastructures		X			Square metres (m^2) of greening added
Anjou	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	The borough plans to include the use of these materials when rebuilding its municipal parks.				X	Square metres (m^2) of permeable coverings
Anjou	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Include BNQ standard 3019-190 in the appropriate provisions in the current zoning bylaw				X	Change to the bylaw
Anjou	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP), special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Change the zoning bylaw and add criteria to the SPAIP regarding the collection, retention and seepage of rainwater				X	Change to the bylaw
Baie-D'Urfé	Maintain green spaces		X				Number of actions taken
Beaconsfield	The zoning bylaw now allows and encourages permeable pavement					X	Application of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	Analyze each project received		X			Square metres (m^2) of permeable coverings
Côte-des-Neiges–Notre-Dame-de-Grâce	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	For parking lots of five units or more, adopt an SPAIP				X	Adoption of the bylaw

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BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-des-Neiges–Notre-Dame-de-Grâce	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Special building, renovation, alteration or occupancy project		X			Application of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Green new curb extensions	Include in summer 2015 for all new curb extensions		X			Square metres (m^2) of greening added
Dollard-Des Ormeaux	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw
Dollard-Des Ormeaux	The zoning bylaw allows the use of permeable surface coverings for parking lots in residential areas		X				Application of the bylaw
Dorval	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw
Kirkland	Use permeable surface coverings in municipal projects	Use 100 m^2 of permeable coverings in our municipal projects by 2020				X	Square metres (m^2) of permeable coverings
Kirkland	Raise awareness among businesspeople and the population about the sustainable construction of parking lots – BNQ standard 3019-190 to control heat islands	Systematically educate each person or business that wishes to construct a parking lot				X	Number of people reached
Kirkland	Change regulations and adopt new regulatory tools to incorporate criteria that favour the collection, retention and seepage of rainwater	Put a regulatory tool into place targeting the retention, collection and seepage of rainwater by 2020				X	Number of regulatory changes or regulations created
Lachine	Minimize the construction of streetside private parking lots in order to maximize landscaped spaces and greening	Refuse tree removal requests for building new parking lots		X			

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Lachine	Use grass in the borough's landscaping projects	Apply whenever possible		X			
Lachine	Everywhere possible, replace lockstone on municipal lands with grass	Apply whenever possible		X			
LaSalle	Reduce paved surfaces when rebuilding roads			X			Square metres (m^2)
LaSalle	Remove paved pathways in parks when they are being revamped			X			Square metres (m^2)
LaSalle	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	When possible as part of reconstruction projects				X	Square metres (m^2) of permeable coverings
LaSalle	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Revise the bylaw				X	Adoption of the bylaw
Le Plateau-Mont-Royal	Change proposed to the urban planning bylaw that aims to control urban heat islands and improve the percolation of rainwater (prohibit the use of roof coverings with a Solar Reflectance Index (SRI) of less than 56 for all new constructions)	Adopt and apply the bylaw				X	Number of projects submitted
Le Plateau-Mont-Royal	When rebuilding pathways, demineralize them and add vegetation	Apply on a case-by-case basis		X			Number of projects
Le Plateau-Mont-Royal	Change proposed to the urban planning bylaw that aims to control urban heat islands and improve the percolation of rainwater	Adopt and apply the bylaw				X	Application of the bylaw

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Plateau-Mont-Royal	Change proposed to the urban planning bylaw that aims to control urban heat islands and improve the percolation of rainwater - Regulate the sustainable construction of parking lots - Require that trees be planted	Adopt and apply the bylaw				X	Number of trees planted
Le Sud-Ouest	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	Analyze each project received		X		X	Number of projects
Le Sud-Ouest	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Analyze the regulations				X	Regulatory changes if necessary
Le Sud-Ouest	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Analyze the regulations				X	Regulatory changes if necessary
Le Sud-Ouest	Increase planted surface	Strengthen grass planting in the Saint-Pierre woonerf and on rue William, east of Peel, near rue du Shannon	X				Square metres (m^2) of greening added
Le Sud-Ouest	Add planted curb extensions		X	X			Number of curb extensions
Le Sud-Ouest	Creat green alleys		X	X			Number of alleys

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mercier–Hochelaga-Maisonneuve	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Urban Development Bylaw 01-275, effective since 2012, allows the use of honeycomb pavement and requires that 15% of the surface area be planted if the parking lot is more than 1000 m^2	X				Application of the bylaw
Montréal-Est	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	For all new municipal building projects, the city commits to using permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic)				X	Square metres (m^2) of permeable coverings
Montréal-Est	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	For ICIs (industrial, commercial and institutional establishments) only, adopt a bylaw based on BNQ standard 3019-190 to control heat islands, which would require, for a parking lot of 20 or more spaces: – that 40% of the parking lot's surface be covered by a canopy; – that the minimum size of a space be reduced to 2.60 x 5.75 metres; – that, above 125% of the minimum number of parking spaces, the spaces must be underground or part of a multi-level parking garage				X	Adoption of the bylaw
Montréal-Nord	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects					X	Square metres (m^2) of permeable coverings
Montréal-Nord	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Nord	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Provision already included in our current bylaw		X			Adoption of the bylaw
Montréal-Ouest	Apply the regulation on protecting buildings against sewer backflows – Bylaw 11-010 (specifically, installing backwater valves)			X			Application of the bylaw
Mont-Royal	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands		X				Application of the bylaw
Mont-Royal	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Change bylaws				X	Adoption of the bylaw
Mont-Royal	Municipal bylaw – reduce the number of parking spaces near metros			X			Application of the bylaw
Mont-Royal	Municipal bylaw – green zone around grounds when they are landscaped or renovated			X			Application of the bylaw
Pierrefonds-Roxboro	Favour underground parking lots within new projects	Bylaw number CA290040	X				Number of new underground parking lots

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pierrefonds-Roxboro	Carry out a pilot project to authorize street parking in an existing area and monitor it to measure the effects and adapt to needs (to minimize the surface area covered by private parking lots, with greening as a result)	Reduce sealed surfaces on private lots by allowing street parking 12 months of the year		X			Square metres (m^2) of sealed surface reduced
Pointe-Claire	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	Carry out a pilot project using permeable materials				X	Square metres (m^2) of permeable coverings
Pointe-Claire	Regulate the sustainable construction of parking lots	Analyze of the regulations and changes to them if necessary			X		Adoption of the bylaw
Rivière-des-Prairies–Pointe-aux-Trembles	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	Systematically apply to all relevant projects		X			Square metres (m^2) of permeable coverings
Rivière-des-Prairies–Pointe-aux-Trembles	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Change the zoning bylaw				X	Adoption of the bylaw
Rivière-des-Prairies–Pointe-aux-Trembles	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Change the bylaws concerned				X	Adoption of the bylaw

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rosemont–La Petite-Patrie	Change the urban planning bylaw to require that at least 20% of the surface area of the grounds in new projects be planted	In November 2014, the borough council adopted a draft bylaw boosting greening efforts to 25%, except in an area that is authorized for principal usage categories such as business or industry, whose maximum authorized coverage rate is 85% and up. This draft bylaw proposes to correlate greening efforts and maximum coverage rate. As a result, the greening percentage would be 25% when the maximum coverage rate is 65% or more, of 30% when the maximum coverage rate is above 50% but below 65%, and as much as 35% in areas where the maximum coverage rate is below 50%. This change helped see 30,000 m^2 planted		X			Adoption of the bylaw Number of square metres (m^2) of greened surface
Rosemont–La Petite-Patrie	Change in January 2011 to the urban planning bylaw ensuring respect of the BNQ standard on parking (Lutte aux îlots de chaleur urbains – Aménagement des aires de stationnement) (controlling urban heat islands – parking lot construction)	These changes aim to include a minimun greening rate of 15% for parking lots with 10 spaces or more, include underground parking lots for buildings with nine or more units, and prescribe non-reflective covering materials for parking, warehousing and loading lots		X			Adoption of the bylaw
Rosemont–La Petite-Patrie	Change to the urban planning bylaw in May 2013 aiming to boost plant cover in the borough	The bylaw requires that any yard with more than 1 metre of space between the building façade and the public street's right-of-way has plant cover		X			Adoption of the bylaw
Sainte-Anne-de-Bellevue	Zoning bylaw for the industrial sector indicating soil sealing rates		X				Application of the bylaw
Saint-Laurent	Adopt a bylaw that governs the construction of sustainable parking lots	Apply the regulation	X	X			Number of sustainable parking lots built
Saint-Laurent	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Strengthen existing standards relative to parking Adopt Bylaw RCA08-08-0001-78 in 2015		X			Adoption of the bylaw

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Set out objectives and SPAIP criteria at the adoption of a special building, renovation, alteration or occupancy project to incorporate principles of bioretention				X	Adoption of the bylaw
Saint-Léonard	Evaluate the feasibility of using permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	Evaluate feasibility in various future construction and renovation projects Renovate park parking Project to move the municipal yard				X	Number of projects using permeable coverings
Saint-Léonard	Carry out an analysis of regulations for the sustainable construction of parking spaces for industrial, commercial and institutional establishments	Carry out an analysis of regulations			X		Analysis report
Senneville	Regulate the sustainable construction of parking lots to control heat islands					X	Adoption of the bylaw
Verdun	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	Change and apply the bylaw			X		Square metres (m^2) of permeable coverings
Verdun	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Adopt a bylaw based on BNQ standard 3019-190 to control heat islands, and apply it (engineering)			X		Adoption of the bylaw

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Verdun	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Change and apply the bylaw				X	Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Use permeable coverings (porous asphalt, porous concrete, concrete pavement and honeycomb systems in concrete or plastic) in municipal projects	Measure to include in new projects			X		Square metres (m^2) of permeable coverings
Villeray–Saint-Michel–Parc-Extension	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Apply Bylaw 01 283-75	X				Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Apply Bylaw 01 283-75	X				Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Change the urban planning regulations to ensure that front yards remain green spaces and prohibit them from being transformed into hard surfaces (ashpalt, concrete, etc.)	Bylaw 01283-20 adopted	X				Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Change the bylaw on site planning and architectural integration programs (SPAIPs) to incorporate criteria that favour the collection, retention and seepage of rainwater and the reduction of heat islands	Bylaw 01283-20 adopted	X				Application of the bylaw

Adaptation measures for heavy rainfalls: Minimize sealed surfaces

BRIEF 2.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Westmount	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw
Westmount	Change regulations or adopt new regulatory tools (site planning and architectural integration program (SPAIP), comprehensive development programs (CDP) , special planning program (SPP), etc.) to incorporate criteria that favour the collection, retention and seepage of rainwater	Stormwater management plan *Guide #6 aménagement paysager* (guide #6 for landscaping) of Bylaw 1305 (SPAIP)				X	Adoption of the bylaw
Westmount	Remove the asphalted portion of Summit Circle within the park in Summit woods, where there are no houses	Work planned for 2015		X			
Westmount	Examine the possibility of replacing asphalt on low-traffic streets with a driving surface that can absorb rainwater					X	
Westmount	Change the municipal regulation to encourage the reduction of sealed surfaces such as asphalted entrances	Zoning Bylaw 1303 and *Guide #6 aménagement paysager* (guide #6 for landscaping) from Bylaw 1305 (SPAIP)				X	Adoption of the bylaw

BRIEF 2.4

Adaptation measures for heavy rainfalls

ENSURE THE CAPACITY OF STORMWATER AND COMBINED SEWER SYSTEMS

Benefits

- Helps reduce the risks of flooding and sewer backflows
- Helps reduce the load of suspended materials and pollutants during combined sewer overflows

Potential co-benefits

- Helps reduce damage to underground utility networks
- Helps reduce road mobility inconveniences (slowed or blocked traffic)
- Helps reduce the risk of road accidents and other kinds of accidents (drowning and electrocution)

Constraints and maladaptation risks

- Carefully evaluate the impacts on the receiving environments in stormwater redirection projects

Why?

In an urban setting, concentrations of heavy metals, salts, oils, grease and other contaminants can be significant. In normal weather, part of these residues is carried away and sediments in sewer system pipes, which reduces the systems' absorption capacity. During a heavy rainfall, the amount of residue left is exacerbated, along with artificial debris (plastics, paper, metal containers, etc.), which can block the entrances to storm drains. We need to put measures into place to ensure the sewer systems' absorption capacity, regardless of the intensity of precipitation.

What we can do

- Inspect and maintain the stormwater and combined sewer systems
- Renovate aging or damaged sewer pipes
- Sweep the streets mechanically to remove coarse solids, such as sand and gravel, and other debris in order to prevent storm drains from being blocked
- Encourage non-contaminated surface water (ex.: from roofs or schoolyards) to drain toward wetlands or watercourses

Adaptation measures for heavy rainfalls: Ensure the capacity of stormwater and combined sewer systems

BRIEF 2.4

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Reduce the risks associated with the impacts of climate change **Objective:** Reduce the quantity and improve the quality of runoff water. The Schéma asks that we consider topography and the sewer system's functioning in order to determine areas of constraint where the regulations must govern the affected usages and define building forms that provide immunity against basement floods	X	
Service de l'eau (water department)	Stratégie montréalaise de l'eau 2011-2020 (Montréal water strategy 2011-2020 – in French only)	1. Pursue the implementation of pluviometry network measurements, system measurements and waste measurements in watercourses to monitor the evolution of climate change and the sewer system's and drainage system's performance 2. Auscultate, investigate and maintain primary and secondary sewer systems 3. Increase the annual refurbishing rate of aqueduct and sewer systems 4. Produce a drainage master plan including hydraulic analyses of all the island's drainage basins, making it possible to sequence the usage of retention works and meet the objectives set by the ministère du Développement durable, de l'Environnement et Lutte contre les changements climatiques (MDDELCC) 5. Construct underground retention works 6. Harmonize the regulations on stormwater retention for large sealed surfaces 7. Study to evaluate the combined drainage system's vulnerability using the protocol set out by Engineers Canada 8. Produce a guide on the role of green infrastructures in urban projects in Montréal and follow up with the administrative units concerned	X	X

Adaptation measures for heavy rainfalls: Ensure the capacity of stormwater and combined sewer systems

BRIEF 2.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Continue the network inspection program (sewers, aqueducts)	Annually inspect a part of the network to ensure its good condition		X			List of inspected sites Kilometres (km) of pipes inspected
Ahuntsic-Cartierville	Carry out a maintenance program on the 10,000 existing sewer manholes in the borough	Four-year program, or 2,500 sewer manholes per year		X			Number of sewer manholes maintained
Ahuntsic-Cartierville	Follow the Ville de Montréal standards for new projects	Works related to the sewer system must be done in keeping with the standards in effect at Ville de Montréal		X			Application of the bylaw
Anjou	Maintain the systems regularly	A problem-solving program exists for problematic pipes, jointly with the central city's program, allowing for inspection by camera in order to fix problems as soon as they show up Respect a three-year cleaning cycle for sump maintenance		X			Kilometres (km) of pipes
Baie-D'Urfé	Maintain the systems regularly			X			Sewer and pipe capacity (m^3)
Beaconsfield	Stormwater action plan for the bassin Willowbrook (constitutes 25% of the territory): control the volume and the quality of wastewater pumped into lac Saint-Louis		X				Number of actions taken
Beaconsfield	Regulate the requirement to install grease and solid waste filters for large-surface parking lots		X				Application of the bylaw
Beaconsfield	Stormwater action plan for the bassin Meadowbrook: control the volume and the quality of wastewater pumped into lac Saint-Louis			X			Number of actions taken
Côte-des-Neiges–Notre-Dame-de-Grâce	Maintain the systems regularly	Conduct an annual cleaning program for problematic sewer manholes and pipes		X			Kilometres (km) of pipes
Côte-Saint-Luc	Maintain the systems regularly	40 km of stormwater system + 61 km of combined system	X				Kilometres (km) of pipes

Adaptation measures for heavy rainfalls: Ensure the capacity of stormwater and combined sewer systems

BRIEF 2.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dollard-Des Ormeaux	Program to find cross-connections and poorly connected catch basins			X			Number of actions taken
Dollard-Des Ormeaux	Clean and inspect sewers	±2% of the network per year		X			Number of inspections
Dorval	Maintain the systems regularly			X			Kilometres (km) of pipes
Kirkland	Scout for cross-connections across the municipality's entire territory	Continue to scout for cross-connections		X			Number of detections
Kirkland	Citizen assistance program to fix cross-connections	Program finished in 2011-2012	X				Amount given in subsidies
Kirkland	Maintain the stormwater sewer system regularly	Continue and extend (as needed) regular maintenance across the entire system		X			Number of kilometres of pipes maintained Detection plan
Kirkland	Direct non-contaminated runoff water toward wetlands or watercourses	Separate sewers for stormwater and sanitary sewage	X				Number of projects
Kirkland	Frequently sweep the streets in order to reduce the quantity of debris carried off by rainwater	Maintain the current frequency of street sweeping and increase it as needed		X			Frequency of sweeping days
Lachine	Continue to seek out and correct sewer cross-connections to reduce untreated wastewater channeled toward watercourses	Project with Parks Canada 2001-2006 Meet with the owner / citizen when a sewer backs up into a residence to prevent future such events Put restrictions and controls into place for channeling wastewater into sewers for ICI (industrial, commercial and institutional establishments)	X				Number of projects
LaSalle	Maintain the systems regularly	50% of the system each year		X			Kilometres (km) of pipes
LaSalle	Boost the frequency of street sweeping in order to reduce the quantity of debris carried off by rainwater	Streets are swept once a week				X	Percentage of increase of street sweeping days

Adaptation measures for heavy rainfalls: Ensure the capacity of stormwater and combined sewer systems

BRIEF 2.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Direct non-contaminated runoff water toward wetlands or watercourses, in cooperation with the ministère du Développement durable, de l'Environnement et Lutte contre les changements climatiques (MDDELCC)	When possible as part of reconstruction projects				X	Number of projects
Le Plateau-Mont-Royal	Maintain the systems regularly	10 km per year		X			Kilometres (km) of pipes
Le Sud-Ouest	Maintain the systems regularly	Clean 2,000 sewer manholes per year		X		X	Number of sewer manholes cleaned
Le Sud-Ouest	Clean sewer manholes	Partnership agreement between the Direction de la gestion stratégique des réseaux d'eau (DGRSE) (strategic water network management department) and Le Sud-Ouest		X			Number of sewer manholes cleaned
Le Sud-Ouest	Install retention basin with plants on promenade Smith	Ville de Montréal major urban projects		X			Number of basins
Le Sud-Ouest	Install seepage basin on rue Basin	Ville de Montréal major urban projects		X			Number of basins
L'Île-Bizard–Sainte-Geneviève	Maintain the systems regularly			X			Kilometres (km) of pipes
L'Île-Bizard–Sainte-Geneviève	Direct non-contaminated runoff water toward wetlands or watercourses, in cooperation with the ministère du Développement durable, de l'Environnement et Lutte contre les changements climatiques (MDDELCC)			X			Number of projects
L'Île-Bizard–Sainte-Geneviève	Boost the frequency of street sweeping in order to reduce the quantity of debris carried off by rainwater	On a regular basis, once per week		X			Percentage of increase in sweeping days / sweeping frequency
Mercier–Hochelaga-Maisonneuve	Maintain the systems regularly	Recurrent annual maintenance program		X			Kilometres (km) of pipes

Adaptation measures for heavy rainfalls: Ensure the capacity of stormwater and combined sewer systems

BRIEF 2.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Est	Maintain the systems regularly	Annually maintain of 25% of the network		X			Kilometres (km) of pipes
Montréal-Nord	Direct non-contaminated runoff water toward wetlands or watercourses, in cooperation with the ministère du Développement durable, de l'Environnement et Lutte contre les changements climatiques (MDDELCC)	Half of the borough's sewer network is separated. Rainwater is directed toward the river				X	Number of projects
Montréal-Nord	Boost the frequency of street sweeping in order to reduce the quantity of debris carried off by rainwater	Once per week		X			Percentage of increase in sweeping days
Montréal-Ouest	Maintain the systems regularly	Conduct a sump cleaning program and repair or replace 1.5% of the system per year		X			Kilometres (km) of pipes
Montréal-Ouest	Boost the frequency of street sweeping in order to reduce the quantity of debris carried off by rainwater	Move from three days a week up to five days a week				X	Percentage of increase in sweeping days
Mont-Royal	Maintain the systems regularly					X	Kilometres (km) of pipes
Mont-Royal	Boost the frequency of street sweeping in order to reduce the quantity of debris carried off by rainwater					X	Percentage of increase in sweeping days
Mont-Royal	Clean street sewer manholes					X	Number of actions taken
Mont-Royal	Sewer rehabilitation, annual maintenance program to minimize system leakage and exfiltration			X			Number of actions taken
Outremont	Maintain the systems regularly	± 7 km per year		X			Kilometres (km) of pipes

Adaptation measures for heavy rainfalls: Ensure the capacity of stormwater and combined sewer systems

BRIEF 2.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pierrefonds-Roxboro	Require that sump pumps linked to the separate sewer system be disconnected (pilot project)	Respect the capacity of the separate sewer system		X			Number of actions taken
Pierrefonds-Roxboro	Continue to seek out and correct sewer cross-connections to reduce untreated wastewater channeled toward watercourses	50% of the goal in 2014		X			Number of actions taken
Pointe-Claire	Maintain the systems regularly	Make sure structures are in good shape and conduct regular maintenance		X			Metres of pipe maintained
Pointe-Claire	Boost the frequency of sidewalk and pathway sweeping in order to reduce the quantity of debris carried off by rainwater	Sweep sidewalks and pathways as regularly as streets, in order to reduce the quantity of debris carried off by rainwater				X	Percentage of increase in sweeping days
Rivière-des-Prairies–Pointe-aux-Trembles	Maintain the systems regularly	Continue with the annual slow sewer maintenance plan		X			Kilometres (km) of pipes
Rivière-des-Prairies–Pointe-aux-Trembles	Direct non-contaminated runoff water toward wetlands or watercourses, in cooperation with the ministère du Développement durable, de l'Environnement et Lutte contre les changements climatiques (MDDELCC)	Where applicable under the current regulations		X			Number of projects
Sainte-Anne-de-Bellevue	Identify the public sewers that drain directly into the lake using signage (painting a yellow fish or posting a sign that says "empties into the lake")					X	Number of actions taken
Saint-Laurent	For many years now, we have installed oil interceptors when building new road segments, to help remove oil and sediment from the stormwater sewer system			X			Number of oil interceptors
Saint-Laurent	Prevent and correct cross-connections as needed			X			Number of corrections made

Adaptation measures for heavy rainfalls: Ensure the capacity of stormwater and combined sewer systems

BRIEF 2.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Respect the municipal regulations on stormwater flow returned to the sewer	Apply Bylaw 1047		X			Application of the bylaw
Saint-Laurent	Direct non-contaminated runoff water toward wetlands or watercourses, in cooperation with the ministère du Développement durable, de l'Environnement et Lutte contre les changements climatiques (MDDELCC)	Apply Bylaw 1047 on retention		X			Number of projects
Saint-Léonard	Maintain the systems regularly				X		Kilometres (km) of pipes
Saint-Léonard	Maintain the high frequency of street sweeping in order to reduce the quantity of debris carried off by rainwater	Sweep the streets once a week across the entire territory		X			Number of sweeps per week
Verdun	Maintain the systems regularly	Scrub at least 2 km of sewer pipes per year and one third of sewer manholes (public works), continuously, meaning the operation is carried out each year		X			Kilometres (km) of pipes
Villeray–Saint-Michel–Parc-Extension	Maintain the systems regularly	Clean 3,000 sewer manholes per year		X			Kilometres (km) of pipes
Villeray–Saint-Michel–Parc-Extension	Boost the frequency of street sweeping in order to reduce the quantity of debris carried off by rainwater	Sweep the entire territory once a week in summer		X			Perecentage of increase in sweeping hours
Westmount	Extend the street sweeping schedule to reduce the quantity of debris carried off by rainwater					X	Percentage of increase in sweeping hours
Westmount	Reinstate the practice of annual systematic cleaning for sewer systems		X				Number of cleaning operations

BRIEF 2.5

Adaptation measures for heavy rainfalls

INCREASE AND PRESERVE TREE AND PLANT COVER

Benefits

- Helps slow down stormwater runoff
- Helps a good percentage of stormwater soak into the ground
- Helps reduce the frequency and volume of combined sewer system overflows and, in some measure, reduce the severity of floods during occasional heavy rains

Potential co-benefits

- Mitigates intra-urban heat islands
- Improves urban living environments
- Preserves biodiversity: provides a habitat and helps preserve animal and plant populations
- Boosts water quality (runoff is less loaded with pollutants)

Why?

Plant cover and trees make it possible to better manage stormwater, since they help the rainwater infiltrate into the ground, slow down storm drainage and in so doing reduce the quantity of runoff water.

Green spaces of all kinds (parks, rain gardens, green roofs, etc.) and of all sizes established on the territory constitute green infrastructures. They help boost rainwater infiltration into the soil and filtration, and so reduce the pressure on drinking water systems and the stormwater network.

What we can do

Plant cover and greening preservation strategies must be considered at the beginning of the planning or requalification phase for an area. They must be taken into account as part of project design just like all other aspects.

- Plant, conserve and protect plants
- Protect and increase the area of green spaces and natural environments
- Revegetate river banks and riparian strips to stabilize them
- Create green alleys
- Encourage urban agriculture

Constraints and maladaptation risks

- Pay special attention to plants to ensure that they are adapted to the environment (sun, water and nutrient needs, exposure to wind and de-icing salts, etc.)
- Create sustained maintenance programs in the design phase for construction works
- In some cases, plants can become a nuisance: damages caused by falling tree branches, damages to infrastructures caused by roots, soiling of parked vehicles due to debris dropping from trees, etc.

Adaptation measures for heavy rainfalls: Increase and preserve tree and plant cover

BRIEF 2.5

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la diversité sociale et des sports (social diversity and sport department)	Integrated urban revitalization program (IUR)	Unis verts urbains projects (greening projects for mineralized or lifeless sites)	X	
Service de la diversité sociale et des sports (social diversity and sport department)	Integrated urban revitalization program (IUR)	**IUR Laurentien-Grenet** (Ahuntsic-Cartierville): create green space including planted mounds and resistant, colourful plants **IUR Saint-Pierre** (Lachine): demineralize the edges of marché Saint-Pierre and create vegetable gardens **IUR Hochelaga** (Mercier–Hochelaga-Maisonneuve): develop a pedestrian-friendly green space **IUR Territoire Nord-Est** (Montréal-Nord): greening project along the edges of five schoolyards to improve the canopy	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Reduce the risks associated with the impacts of climate change **Objective**: Increase the leaf surface area index to 25% by 2025 and carry out the general greening of the territory	X	
Service de la mise en valeur du territoire (territory enhancement department)	Plan d'urbanisme (2004) (urban development plan (2004) – in French only)	**Objective 16**: Preserve and develop the natural heritage **Action 16.1**: Preserve and develop natural environments and encourage their integration into urban development	X	
Service de l'environnement (environment department)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 34**: Strengthen the ecological management of green spaces on the Montréal territory	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Tree Policy of Montréal (2005)	The Tree Policy places trees at the core of Montréal urban planning, to give the metropolis a viable and sustainable future, improve the quality of living environments, and increase and preserve tree cover	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Plan d'action canopée 2012-2021 (canopy action plan 2012-2021 – in French only)	This plan aims to reach 25% tree cover in the Montréal agglomeration by 2025. It will translate into the planting of 300,000 trees, not counting the replacement of sick or dead trees.	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Politique de protection et de mise en valeur des milieux naturels (2004) (policy on the protection and development of natural environments (2004) – in French only)	One of the policy's objectives is to maximize biodiversity and increase the surface area of protected natural environments in Montréal	X	

Adaptation measures for heavy rainfalls: Increase and preserve tree and plant cover

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Plan greening and tree-planting actions in all urban projects	Take part in the canopy plan and the tree policy		X			Number of trees planted
Ahuntsic-Cartierville	Protect and maintain green spaces and natural environments to help them effectively play their ecological role	Included in zoning Bylaw 01-274 Manage green spaces ecologically Raise citizen awareness of the benefits of green spaces and the protection of natural environments		X			Type and number of projects carried out
Anjou	Plant, conserve and protect trees – Greening	The borough projects that it will plant an annual average of 100 trees, increasing its canopy from year to year		X			Tree report
Anjou	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Include BNQ standard 3019-190 in the appropriate provisions in the current zoning bylaw				X	Change to the bylaw
Baie-D'Urfé	Plant, conserve and protect trees – Greening			X			Tree report
Baie-D'Urfé	Tree donations – Earth Day			X			Number of trees donated
Beaconsfield	Increase and preserve plant cover			X			Square metres (m^2) of greening
Côte-des-Neiges–Notre-Dame-de-Grâce	Plant, conserve and protect trees – Greening	Plant 5,600 trees by 2021 (canopy action plan)				X	Tree report
Côte-des-Neiges–Notre-Dame-de-Grâce	Expand and protect green spaces and natural environments	Conduct urban planning in collaboration with the Service de la mise en valeur du territoire (territory enhancement department)				X	Hectares
Côte-des-Neiges–Notre-Dame-de-Grâce	Create green alleys – Greening	Continue to raise awareness about the program		X			Number of green alleys created
Côte-des-Neiges–Notre-Dame-de-Grâce	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	For parking lots of five spaces and more, adopt a site planning and architectural integration program (SPAIP)				X	Adoption of the bylaw

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Côte-des-Neiges–Notre-Dame-de-Grâce	Significantly increase the streetside tree cover to limit the effects of urban heat islands	Take into consideration in every new project		X			Number of streets with planted borders
Côte-des-Neiges–Notre-Dame-de-Grâce	Increase information dissemination and awareness-raising to empower every person (citizens, municipal employees, institutional and associative partners, major landowners, etc.) in regard to protecting the borough's arboreal heritage	Use various means of communication at the borough's disposal (newspapers, newsletters, Internet capsules, Twitter, Facebook, etc.)		X			Number of people reached
Côte-des-Neiges–Notre-Dame-de-Grâce	Increase plant density by creating innovative landscaping (green alleys, plant walls) tailored to residents' needs	Continue to promote green alleys		X			Number of alleys
Côte-des-Neiges–Notre-Dame-de-Grâce	Take greening measures for all new parking lots	Implement a site planning and architectural integration program (SPAIP) for parking lots with five or more spaces				X	Square metres (m^2) of greening
Côte-des-Neiges–Notre-Dame-de-Grâce	Make it easier for citizens to create green alleys by developing an implementation guide	Guide created and available on our website		X			Guide
Côte-des-Neiges–Notre-Dame-de-Grâce	Pursue the planting strategy to obtain a regular inventory of the borough's planted and urban components			X			Inventory
Côte-des-Neiges–Notre-Dame-de-Grâce	Green a greater proportion of private land for new construction projects	Establish new standards based on best practices in other boroughs and cities in Québec and Canada				X	Square metres (m^2) of greening
Côte-Saint-Luc	Plant, conserve and protect trees – Greening	3,509 trees (April 2015)		X			Tree report
Côte-Saint-Luc	Expand and protect green spaces and natural environments	Three existing forests	X				Hectares
Dollard-Des Ormeaux	Plant, conserve and protect trees – Greening					X	Tree report
Dollard-Des Ormeaux	Expand and protect green spaces and natural environments					X	Hectares

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Administrative units that will implement this measure

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Dollard-Des Ormeaux	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw
Dollard-Des Ormeaux	The city adopted a bylaw on tree maintenance and protection. The bylaw applies to private trees to the front and side of buildings as well as to public trees lining streets, in parks, and in green spaces and woods	Bylaw 2007-023	X				Application of the bylaw
Dollard-Des Ormeaux	The city sees to the protection of its 33 parks. The parc-nature du Bois-de-Liesse falls under the Ville de Montréal's Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)		X				
Dorval	Plant, conserve and protect trees – Greening			X			Tree report
Dorval	Expand and protect green spaces and natural environments			X			Surface concerned in square metres (m^2)
Kirkland	Create parks and green spaces in new neighbourhoods	Create at least one green space or park in each new neighbourhood created				X	Number of parks and green spaces created
Kirkland	Plant, conserve and protect trees	Plant 100 new trees each year and systematically replace each tree cut down by 2020		X			Annual tree planting report
Kirkland	Expand and protect green spaces and natural environments	Protect 100% of green spaces and natural environments and increase the surface area when new land becomes available		X			Number of hectares protected
Kirkland	Raise awareness among businesspeople and the population about the sustainable construction of parking lots – BNQ standard 3019-190 to control heat islands	Systematically educate each person or business that wishes to construct a parking lot				X	Number of people reached

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Lachine	Increase the arboreal heritage	Regular annual planting program: 180 trees per year		X			Number of trees planted
Lachine	Adopt an urban forestry policy	Tree Policy	X				Number of trees planted
Lachine	Create green spaces, particulalry as part of new building projects (Verso, Émile-Pominville)	Create a park (Remembrance)		X			Area landscaped in square metres (m^2)
Lachine	Densify vegetation in all public spaces			X			Area landscaped in square metres (m^2)
Lachine	Require the owners of new residential buildings with more than eight housing units to plant at least one tree per eight units on their building's lot and to keep them in good health	One tree per 200 m^2 of vacant ground		X			Number of trees planted
Lachine	Require the owners of commercial and industrial spaces to renaturalize the equivalent of 5% of all parking surfaces and add at least one tree per 25 parking spaces for new constructions					X	Number of trees planted
Lachine	Continue to plant the Promenade du rail	175 trees	X				Number of trees planted
Lachine	Continue to take detailed inventory of the arboreal heritage		X				Inventory
Lachine	Continue the tree planting program, particularly in commercial and industrial areas	Inventory finished for the industrial area in 2014	X				Number of trees planted
Lachine	Revamp 1ere Avenue by adding strips of grass and trees from autoroute 20 to rue Provost	Plant 12 trees (2015)	X				Number of trees planted
Lachine	Make sure that tree protection bylaws are respected on private property	Current bylaw on ash trees on private land / emerald ash borer Tree Policy in effect on private front yard trees		X	X		Application of the bylaw

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Administrative units that will implement this measure

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LaSalle	Include planted areas when rebuilding streets			X			Square metres (m^2) Number of trees
LaSalle	IUR Airlie Bayne (Programme de revitalisation urbaine intégrée (integrated urban revitalization program)) – Plant 400 trees and 285 shrubs on streets, schoolyards and industrial lots		X				Number of trees
LaSalle	Plant, conserve and protect trees – Greening			X			Tree report
LaSalle	Expand and protect green spaces and natural environments	When possible as part of reconstruction projects				X	Hectares
LaSalle	Create green alleys – Greening		X				Number of green alleys created
LaSalle	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	The parking lot at Octogone will be part of this for its expansion project				X	Adoption of the bylaw
Le Plateau-Mont-Royal	Protect trees in winter and leave a ring around trees during snow removal	Systematize the practice		X			Number of trees concerned
Le Plateau-Mont-Royal	Expand and protect green spaces and natural environments	One project: closure of rue Clark and creation of a park near the Champ des possibles				X	Number of projects
Le Plateau-Mont-Royal	Create green alleys – Greening	40 green alleys created				X	Number of green alleys created
Le Plateau-Mont-Royal	Implement a strategic plan to control the emerald ash borer	Adopt the plan				X	Adoption of the plan
Le Plateau-Mont-Royal	Create biodiversity zones	Two zones created				X	Number of zones created
Le Plateau-Mont-Royal	Distribute plants to citizens	Annual budget for plant distribution: $8,000/year				X	Number of plants
Le Sud-Ouest	Plant, conserve and protect trees – Greening	Plant 8,900 trees by 2025		X		X	Tree report

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Le Sud-Ouest	Expand and protect green spaces and natural environments	Maintain current surfaces		X		X	Hectares
Le Sud-Ouest	Create green alleys – Greening	Green more alleys: – Ruelle de l'arbre fort (Desnoyers), first green alley in Saint-Henri – Create two green alleys: Blanchard and Charon-Bourgeoys with flower bins – Six green alleys closed to traffic	X	X		X	Number of green alleys created
Le Sud-Ouest	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Analyze the regulations and changes to them if necessary				X	Application of the bylaw
Le Sud-Ouest	Better landscaping aiming to integrate the Woonerf Saint-Pierre into the urban landscape of the Sud-Ouest borough (greening project)	Winner of the second edition of the Vers des rues plus conviviales (toward more user-friendly streets) competition in 2014	X				Planted surface (in m^2)
Le Sud-Ouest	Protect the falaise Saint-Jacques (2.5 hectares) and parc Angrignon (100 hectares)	Protect the cliff in keeping with the policy on the protection and development of natural environments		X			Hectares
L'Île-Bizard–Sainte-Geneviève	Plant, conserve and protect trees – Greening			X			Tree report Number of trees planted
L'Île-Bizard–Sainte-Geneviève	Expand and protect green spaces and natural environments				X		Hectares
Mercier–Hochelaga-Maisonneuve	Plant, conserve and protect trees – Greening	On streets: 330 trees/year + the number of trees required as part of the canopy project since 2013 In parks: +/- 100 trees/year		X			Tree report
Mercier–Hochelaga-Maisonneuve	Expand and protect green spaces and natural environments	Carry out new park landscaping each year + Jean-Milot woods + Longue-Pointe industrial spur		X			Hectares
Mercier–Hochelaga-Maisonneuve	Create green alleys – Greening	Eight new green alleys per year		X			Number of green alleys created

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Mercier–Hochelaga-Maisonneuve	Regulate the sustainable construction of parking lots to control heat islands – BNQ standard 3019-190 to control heat islands	Urban Development Bylaw 01-275, effective 2012, contains a number of requirements compatible with the greening standard	X				Application of the bylaw
Mercier–Hochelaga-Maisonneuve	Develop a landscaping guide for green alleys	Written in 2013	X				Guide
Mercier–Hochelaga-Maisonneuve	Change the regulation to favour the creation of greening measures and/or runoff water harvesting measures for all new public parking lots of five spaces or more	Since 2012. Urban Development Bylaw 01-275.	X				Application of the bylaw
Mercier–Hochelaga-Maisonneuve	Change the regulations to favour better protection of trees located on private land	Since 2012, Urban Development Bylaw 01-275	X				Application of the bylaw
Mercier–Hochelaga-Maisonneuve	Change the regulation to favour a higher proportion of greening on private lands for new construction projects	Since 2012, Urban Development Bylaw 01-275	X				Application of the bylaw
Mercier–Hochelaga-Maisonneuve	Promote the greening of private residential land	Have Éco-Quartier team conduct awareness-raising and tree planting		X			Number of trees planted
Mercier–Hochelaga-Maisonneuve	Promote greening-related eco-responsible acts to school, industry and business managers	Have Éco-Quartier team conduct awareness-raising		X			Number of people reached
Mercier–Hochelaga-Maisonneuve	Green the yard at Pavillon d'éducation communautaire HoMa at 1691, boulevard Pie-IX	Éco-quartier program framework		X			Surface concerned in square metres (m^2)
Mercier–Hochelaga-Maisonneuve	Green Pie-IX/Maisonneuve/PDC sites	Quartier vert (green neighbourhood) project		X			Surface concerned in square metres (m^2)
Montréal-Est	Plant, conserve and protect trees – Greening	Develop a master plan to increase the canopy by 25% in keeping with the Schéma de l'agglomération de Montréal (Montréal urban agglomeration land use and development plan)			X		Tree report

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Administrative units that will implement this measure

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Montréal-Est	Regulate the sustainable construction of parking lots to control heat islands – BNQ standard 3019-190 to control heat islands	For ICIs (industrial, commercial and institutional establishments) only, adopt a bylaw based on BNQ standard 3019-190 to control heat islands, which would require, for a parking lot of 20 or more spaces: – that 40% of the parking lot's surface be covered by a canopy; – that the minimum size of a space be reduced to 2.60 x 5.75 metres; – that, above 125% of the minimum number of parking spaces, the spaces must be underground or part of a multi-level parking garage				X	Adoption of the bylaw
Montréal-Nord	Plant, conserve and protect trees– Greening	Canopy project – 499 trees planted in 2015 – adopted		X			Tree report
Montréal-Nord	Expand and protect green spaces and natural environments	Green corridor project – in progress		X			Hectares
Montréal-Nord	Create green alleys – Greening	Replaced, in 2015, by a program to build green curb extensions		X			Number of green alleys created
Montréal-Nord	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Projects already carried out in 2014-2015: corner Henri-Bourassa and Lacordaire, corner Langelier and Léger, etc.				X	Adoption of the bylaw
Montréal-Ouest	Plant, conserve and protect trees – Greening	Increase the allotted budget				X	Tree report
Mont-Royal	Plant, conserve and protect trees – Greening	Green industrial and residential areas				X	Tree report
Mont-Royal	Expand and protect green spaces and natural environments	Adopt a three-year tree maintenance plan, and better application of the municipal bylaw – required planting after cutting down a tree				X	Hectares
Mont-Royal	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands		X				Adoption of the bylaw

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Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Outremont	Pursue the renewal of the arboreal heritage	Plant 90 trees per year		X			Number of trees planted
Outremont	Plan green spaces as part of new building projects	Campus Outremont project				X	Square metres (m^2) of greening
Outremont	Create green alleys – Greening	Two alleys		X			Number of alleys
Pierrefonds-Roxboro	Increase the arboreal heritage	Annual tree planting program		X			Number of trees planted
Pierrefonds-Roxboro	Adopt an urban forestry plan	Adopt of a plan in 2016			X		Adoption of a plan
Pointe-Claire	Plant, conserve and protect trees– Greening	Increase the canopy year by year		X			Tree inventory
Pointe-Claire	Regulate the sustainable construction of parking lots	Analyze the regulations and make changes to them if necessary			X		Adoption of the bylaw
Pointe-Claire	Distribute native tree seedlings for citizens	Preserve and increase the tree and plant cover in Pointe-Claire despite pest insects				X	Number of seedlings distributed
Rivière-des-Prairies–Pointe-aux-Trembles	Plant, conserve and protect trees– Greening	Apply systematically in our projects		X			Tree report
Rivière-des-Prairies–Pointe-aux-Trembles	Expand and protect green spaces and natural environments	Apply based on projects included in the three-year building program (PTI)		X			Hectares
Rivière-des-Prairies–Pointe-aux-Trembles	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Change the zoning bylaw				X	Adoption of the bylaw
Rivière-des-Prairies–Pointe-aux-Trembles	Plant a minimum of around 300 trees each year. The plan for 600 trees in 2013 was made possible by the Plan d'action canopée 2012-2021 (canopy action plan 2012-2021 – in French only)	545 trees were planted in 2014. However, the canopy action plan will not be available in 2015 for our borough	X				Number of trees planted

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Administrative units that will implement this measure

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Rivière-des-Prairies–Pointe-aux-Trembles	Progressively revise the regulations in order to include elements that help with greening and heat island control, mainly for new building and development projects applicable, for example, to parking lots, roofs and terraces, new subdivisions, public and private areas, etc.	Regulation revision underway			X		Adoption of the bylaw
Rosemont–La Petite-Patrie	Create green alleys. In 2010, the borough created a program to fund green alley projects each year and support citizen committees in collaboration with Éco-quartier	Total: 82 green alleys	X				Number of green alleys created
Rosemont–La Petite-Patrie	Increase the canopy. Since 2012, the borough has taken part in the Plan d'action canopée 2012-2021 (canopy action plan 2012-2021 – in French only)	From 2012 to 2014: 1,519 trees were planted (parks and streets)	X				Participation in the canopy program Tree report
Rosemont–La Petite-Patrie	Create green curb extensions	Total greened curb extensions: 83 built + 147 to come (2015)	X		X		Number of green curb extensions
Rosemont–La Petite-Patrie	Favour the construction of sidewalks with grassed buffers along the sides as part of the road renovation program for the borough's network of arteries	Total street sections with grassed buffers: 23 + five to come (2015)	X		X		Number of sections landscaped with grassed buffers
Rosemont–La Petite-Patrie	Build street gardens. Since 2010, every spring, we carry out the Jardin de rue (street garden) project, which consists of having citizens remove the asphalt that covers old sidewalk buffers and plant gardens there instead	Total: 14 sections* with street gardens *Section = portion of a street between two intersections	X				Number of sections featuring street gardens
Sainte-Anne-de-Bellevue	Include criteria to protect and include green spaces within urban development plans			X			
Sainte-Anne-de-Bellevue	Develop greenhouses on industrial building roofs			X			Number of greenhouses

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Sainte-Anne-de-Bellevue	Implement regulations to preserve the largest possible natural or wooded space when developing or renovating					X	Adoption of bylaws
Sainte-Anne-de-Bellevue	Preserve plants and greenery on the bike path by expanding the planting of fruit trees along the path		X				Number of trees planted
Saint-Laurent	Adopt an urban forestry plan	Adopt the plan in 2009	X				Application of the plan
Saint-Laurent	Created the Révélez votre nature (reveal your nature) greening campaign for the business community, which made it possible to plant 1,354 trees and shrubs starting in June 2011	Encourage and assist companies in planting trees on their sites. Between 2008 and 2012, 624 trees and 766 shrubs were planted as part of the campaign		X			Number of companies and number of trees and shrubs planted
Saint-Laurent	Create new landscaped green spaces	Bois-Franc and Nouveau Saint-Laurent neighbourhoods Improve the green space ratios per piece of land		X			Number of green spaces
Saint-Laurent	Maintain the Un enfant, un arbre (one child, one tree) program launched in 2010			X			Number of citizens reached
Saint-Laurent	Plant, conserve and protect trees–Greening	The borough planted 1,298 trees in 2009, 1,022 trees in 2010, 341 trees in 2011, 957 trees in 2012, 929 trees in 2013 and 528 trees in 2014 to help control heat islands and in keeping with the forestry plan	X				Number of trees planted
Saint-Laurent	Continue to create parks and green spaces in new developments			X			Hectares
Saint-Laurent	Continue to landscape and maintain the woods in parc Marcel-Laurin			X			Hectares
Saint-Laurent	Continue to green parc Philippe-Laheurte			X			Hectares

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Saint-Laurent	Continue to conduct ecological management of green spaces and natural environments in the Dr-Bernard-Paquet and Guillaume-Bruneau parks by carrying out a fauna and flora inventory			X			Inventory
Saint-Laurent	Preserve the borough's ash trees as part of the emerald ash borer control action plan			X			Number of ash trees treated
Saint-Laurent	Plant, conserve and protect trees – Greening	Produce a report on trees planted on private land for 2014 Adopt Bylaw RCA08-08-0001-78, which requires increased planting	X		X		Tree report
Saint-Laurent	Expand and protect green spaces and natural environments	Develop a master plan to connect green spaces and natural environments in order to create biodiversity links				X	Number of connections created
Saint-Laurent	Create green alleys – Greening	In 2015-2016, renovate rue de Londres and rue Stanislas in the Norvick area in order to reduce mineralized surfaces			X		Number of green alleys created
Saint-Laurent	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Strengthen existing parking standards Adopted Bylaw RCA08-08-0001-78 in 2015		X	X		Adoption of the bylaw
Saint-Léonard	Submit greening projects to various granting programs	De la racine à la cime (from root to crown) library project (Recognition of competencies – RAC), park landscaping projects, dog parks, etc.			X	X	Number of projects submitted Number of projects that have received subsidies
Saint-Léonard	Create green alleys – Greening	Renovate the public alley located between rues Jean-Talon, de Pontoise, le Maître and L'Assomption			X		Number of green alleys created
Saint-Léonard	Analyze the possibility of protecting green spaces and natural environments	Identify spaces to protect (parks, bassin Chartier, other natural environments) and confirm the relevance of protecting them				X	Analysis As needed, protected hectares

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Saint-Léonard	Carry out an analysis of regulations for the sustainable building of parking lots for industrial, commercial and institutional establishments	Analyze the feasibility of regulatory change Compare with best practices in cities and elsewhere			X		Analysis report
Senneville	Put measures into place to protect and develop roads, forest corridors, wetlands, river banks, littoral zones and floodplains					X	
Verdun	Plant, conserve and protect trees– Greening	Purchase and plant trees that are adapted to new climate conditions (public works–horticulture)		X			Tree report
Verdun	Create green alleys – Greening	Two green alleys created in 2015	X	X			Number of green alleys created
Verdun	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Adopt and apply the bylaw			X		Adoption of the bylaw
Ville-Marie	Accentuate collaboration with the Éco-quartiers to encourage greening initiatives					X	Number of meetings
Ville-Marie	Adapt regulatory tools and building criteria to maximize greening and heat island control, mainly for parking lots, roofs and terraces, new subdivisions, public and private lands, etc.	Appy the objectives and criteria when new development or site requalification projects are submitted		X			Number of projects
Ville-Marie	Distribute native tree seedlings					X	Number of seedlings distributed
Ville-Marie	Remove parking for greening and planting			X			Square metres (m^2) of greening
Villeray–Saint-Michel–Parc-Extension	Plant, conserve and protect trees – Greening	Plant 600 trees per year		X			Tree report
Villeray–Saint-Michel–Parc-Extension	Create green alleys – Greening	Create six alleys per year		X			Number of green alleys created

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UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Villeray–Saint-Michel–Parc-Extension	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Apply Bylaw 01 283-75	X				Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Adopt a protocol to implement green alleway and greening projects in the borough	Create green alleys	X				Adoption of the protocol
Villeray–Saint-Michel–Parc-Extension	Encourage industrial, commercial and institutional establishments to adopt greening measures	Bylaw 01 283-20 adopted				X	Number of meetings
Villeray–Saint-Michel–Parc-Extension	Produce an urban forestry plan to favour the recognition and preservation of the borough's arboreal heritage	Tree Policy				X	Adoption of the plan
Villeray–Saint-Michel–Parc-Extension	Revise the rules relative to tree planting and greening on private land in order to boost plant cover, particularly when issuing building permits	Bylaw 01 283-20 adopted	X				Square metres (m^2) of greening
Westmount	Plant, conserve and protect trees – Greening		X				Tree report
Westmount	Expand and protect green spaces and natural environments		X				Hectares
Westmount	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	*Guide #6 aménagement paysager* (guide #6 for landscaping) for Bylaw 1305 (site planning and architectural integration program (SPAIP))	X				Application of the bylaw
Westmount	Plant vegetation alongside streets and alleys		X				Surface concerned in square metres (m^2)

BRIEF 2.6

Adaptation measures for heavy rainfalls

DEVELOP EMERGENCY MEASURES FOR HEAVY RAINFALLS

Benefits

- Protection of the population, their goods and the environment by setting up and planning interventions that are under the responsibility of the cities and boroughs
- Optimization of the effectiveness of crisis management interventions

Potential co-benefits

- Reduced public health risks

Constraints and maladaptation risks

- Difficult coordination among numerous players

Why?

In times of intense rain, sewer system flow (particularly combined sewers) can increase drastically over a very short period, leading to system saturation and, by the same token, floods and sewer backflows. Floods cause closures of roads, tunnels and parts of the metro system, among other things, which interferes with people's mobility on the territory. They can also damage homes and even make them no longer habitable. We need to act quickly to mitigate the damages caused to both citizens and infrastructures. The planning of emergency measures serves not only to prevent emergency situation risks by measuring the human and economic impacts of a disaster, but also to review the relevance of the methods we deploy during such events and to improve our tools. When well planned, emergency measures can protect citizens and living environments and help minimize damages.

What we can do

Strengthen our intervention capacity by collaborating closely with the Centre de sécurité civile, which has a multidisciplinary team, to implement emergency measures (also applies to other extreme weather events).

In particular:

- Make sure that tools are up to date:
  - the borough's Emergency, Relief and Missions Plan
  - the special response plans (SRPs): SRP for heavy rainfalls and SRP for floods
- Locally, keep employee training up to date for this type of intervention
- Inform landowners and residents living in exposed areas

Adaptation measures for heavy rainfalls: Develop emergency measures for heavy rainfalls

BRIEF 2.6

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de sécurité incendie de Montréal – Centre de sécurité civile (fire prevention service – civil protection centre)	Special response plan – heavy rainfalls (in preparation)			X

Adaptation measures for heavy rainfalls: Develop emergency measures for heavy rainfalls

BRIEF 2.6

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Develop an action guide for heavy rainfalls in order to facilitate emergency operations in public spaces	Use the guide for operations on the ground	X				Action guide

Adaptation measures for heat waves

MITIGATE HEAT ISLANDS

Benefits

- Limitation of surfaces' heat absorption
- Reduction of ambient temperatures

Potential co-benefits

- Increased tree and plant cover
- Planted surfaces can in some cases help reduce stormwater runoff and encourage a considerable percentage of rainwater to infiltrate into the ground (adaptation to heavy rainfalls)
- Preservation of biodiversity and air quality, and improvement of living environments
- Maintenance of water quality (reduction of runoff water)
- Attenuation of public health risks
- Can, under some conditions, help reduce problems associated with the drying out of clay soils

Constraints and maladaptation risks

- Pay particular attention to plant choice; diversify the species
- Additional costs (both financial and in human resources) for plant maintenance; maintenance must be planned starting at a project's design phase

Why?

These heavily mineralized spaces, which absorb and store heat, have negative impacts on citizens' health and on the urban environment.

What we can do

Actions to mitigate intra-urban heat islands can be put into place at the design and planning phase of a project or space redesign:

- Include requirements on the morphology and organization of buildings and traffic lanes to prevent urban "canyons"
- Limit mineralized surfaces (large parking lots and large flat roofs) that absorb great quantities of solar heat
- Use materials that can reflect the sun's rays and make the soil permeable
- Plant, conserve and protect trees
- Put regulations into place regarding a high ratio of green spaces to the built environment, thermal properties of the materials used in building construction and surface coverings, parking lot design, etc.
- Put into place greening strategies (green alleys, green walls, etc.) to conserve, protect and create green spaces and grow plant cover (this boosts thermal comfort due to its strong capacity to absorb and retain solar energy)
- Design and create durable public infrastructures that limit heat accumulation (narrower public streets, trees alongside roads, etc.)

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Direction générale – Division du développement durable (headquarters – sustainable development division)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 15**: Contribute to the greening and reduction of heat islands (by adapting regulatory tools and building criteria)	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Reduce the risks associated with the impacts of climate change **Objective**: Adopt measures appropriate for controlling heat islands, which are translated into provisions in the complementary document (section 4.2.2).They constitute the minimum limits that the municipalities and boroughs must respect in their urban planning regulation	X	
Service de la mise en valeur du territoire (territory enhancement department)	Plan d'urbanisme de Montréal (2004) (2004 Montréal urban development plan – in French only)	**Objective 17**: Apply best management practices for resources in the urban context **Action 17.1**: Support healthier urban planning (this action aims to encourage the reduction of mineralized surfaces and counter the effects of heat islands)	X	
Service de la mise en valeur du territoire (territory enhancement department)	Guide technique pour la construction de toits végétalisés (2013) (technical guide for building green roofs (2013) – in French only)	This guide sets out the process for ensuring that this type of roof meets the same objectives as those set by the Quebec Construction Code. It only applies to buildings governed by the Ville de Montréal's construction bylaw, allowing the boroughs to deliver permits for the construction of green roofs	X	
Service de la diversité sociale et des sports (social diversity and sport department)	Integrated urban revitalization program (IUR)	Unis verts urbains projects (greening projects for mineralized sites or sites where plants have withered)	X	
Service de la diversité sociale et des sports (social diversity and sport department)	Integrated urban revitalization program (IUR)	**IUR Laurentien-Grenet** (Ahuntsic-Cartierville): create a green space with planted mounds and resistant, colourful plants **IUR Saint-Pierre** (Lachine): demineralize the edges of marché Saint-Pierre and create vegetable gardens **IUR Hochelaga** (Mercier-Hochelaga-Maisonneuve): develop of a pedestrian-friendly green space	X	

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la gestion et de la planification immobilière (property planning and management department)	Politique de développement durable pour les édifices de la Ville de Montréal (2009) (sustainable development policy for the Ville de Montréal's buildings (2009) – in French only)	All building projects put forth by Montréal, regardless of surface area, must include structural elements to encourage green roofs in new constructions or renovation projects (at minimum design the structure with a view to building a green roof)	X	
Service de l'eau (water department)	Stratégie montréalaise de l'eau 2011-2020 (Montréal water strategy 2011-2020 – in French only)	Submit the Guide sur le rôle des infrastructures vertes dans les projets urbains à Montréal (guide on the role of green infrastructures in Montréal urban projects – in French only) and follow up with the administrative units concerned	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Tree Policy of Montréal (2005)	The Tree Policy places the tree at the core of Montréal's urban development to ensure that the city has a viable, sustainable future, improve the quality of living environments and reduce urban heat islands	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Plan d'action canopée 2012-2021 (canopy action plan 2012-2021 – in French only)	This plan aims to reach 25% tree canopy in the Montréal agglomeration by 2025. This will translate into planting 300,000 trees, not counting the replacement of dead or sick trees	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Promenades urbaines - Vision (2012) (urban walking trails - vision 2012 – in French only)	Create of urban corridors with the objective, among others, of multiplying greening initiatives in heavily mineralized environments The Promenade Fleuve-Montagne will be the first walking trail to be created on the Montréal territory as a legacy for the 375th anniversary		
Service des infrastructures, de la voirie et des transports (infrastructure, roads and transportation department)	Guide d'aménagement durable des rues de Montréal (2013) (Montréal sustainable street construction guide (2013) – in French only)	**Orientation**: Improve the quality and tranquility of living environments **Objective**: Contribute to greening and the reduction of heat islands. Action measures and a monitoring process are set out in a series of technical briefs	X	

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Plant, conserve and protect trees – Greening	Encourage people to plant trees on private land (included in zoning Bylaw 01-274) Monitor tree policy actions	X	X			Application of the bylaw
Ahuntsic-Cartierville	Build green curb extensions	Included in the local urban mobility plan		X			Number of curb extensions greened
Ahuntsic-Cartierville	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Included in zoning Bylaw 01-274 (white roofs)	X				Number of white roofs installed
Ahuntsic-Cartierville	Regulate the sustainable construction of parking spaces	Included in zoning Bylaw 01-274	X				Application of the bylaw
Ahuntsic-Cartierville	Regulate the green coverage ratio	Included in zoning Bylaw 01-274	X				Application of the bylaw
Ahuntsic-Cartierville	Create public and/or private green alleys	Collaborate with Ville en vert – Plan is for two or three green alleys				X	Number of green alleys
Ahuntsic-Cartierville	Planting of community gardens on mineralized sites (containers)	Implement project in collaboration with our partners				X	Number of sites
Anjou	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	The borough is evaluating the possibility of changing the current zoning bylaw to include provisions relative to white roofs and green roofs, particularly in commercial and industrial areas				X	Number of white or green roofs installed
Anjou	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Current zoning bylaw sets out a minimum plant cover for residential areas for all existing or forthcoming constructions. In the long term, we also plan to implement and/or add to this percentage in commercial and industrial areas				X	Change to the bylaw
Anjou	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Include BNQ standard 3019-190 in the appropriate provisions in the current zoning bylaw		X			Change to the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Anjou	Plant, conserve and protect trees – Greening	The borough plans to plant an annual average of 100 trees, thus increasing its canopy from year to year		X			Tree report
Anjou	Build green walls – Greening	The borough plans to green the remaining two thirds of its sound abatement walls using vines				X	Square metres (m^2) of walls built
Anjou	Favour the use of reflective and permeable materials	Include a list of reflective and permeable materials in the zoning bylaw				X	Number of projects
Baie-D'Urfé	Standardize buildings' right of way as well as impermeable materials in order to preserve green space	Respect municipal regulations to obtain a permit	X				Number of inspections
Baie-D'Urfé	Plant trees – street greening			X			Number of trees planted
Beaconsfield	Rebuild a part of the roof on the building that houses the public works service, making it a green roof with a section of white roof		X				
Beaconsfield	Improve green infrastructures by increasing the canopy by 5% by 2025 as compared to 2007	Increase the canopy by 5% by 2025 as compared to 2007			X	X	Number of trees planted
Beaconsfield	Increase fines for cutting down trees without authorization			X			Number of trees cut down
Beaconsfield	Maintain planting on public lands and develop partnerships in order to increase the number of trees on public and private lands			X			Number of trees planted
Beaconsfield	Change the zoning bylaw to include more green space and tree planting in shopping centre parking lots				X		Adoption of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands					X	Adoption of the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-des-Neiges–Notre-Dame-de-Grâce	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions					X	Adoption of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Adoption of a site planning and architectural integration program (SPAIP) for parking lots of five or more spaces				X	Adoption of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Plant, conserve and protect trees – Greening	Follow the orientations set out in the Plan d'action de foresterie urbaine (urban forestry action plan – in French only)				X	Tree report
Côte-des-Neiges–Notre-Dame-de-Grâce	Create green alleys – Greening	Respond favourably to citizen requests – create one to three green alleys per year				X	Number of green alleys created
Côte-des-Neiges–Notre-Dame-de-Grâce	Favour the use of reflective and permeable materials					X	Adoption of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Adopt regulations for the construction and renovation of residential and commercial building roofs that favour a maximum reflection rate for the sun's rays	Adopt a bylaw that requires white roofs for new constructions and that will make it possible, through a site planning and architectural integration program (SPAIP), to manage replacements when technical considerations must be taken into account				X	Adoption of the bylaw
Côte-des-Neiges–Notre-Dame-de-Grâce	Encourage light-coloured surface coverings for new loading, storage and parking areas	Develop a bylaw				X	Square metres (m^2) of light-coloured surface covering
Côte-des-Neiges–Notre-Dame-de-Grâce	Significantly increase the streetside plant cover to limit the effects of urban heat islands	Programme Renouveau urbain (urban renewal program) from the Ministère des Affaires municipales et de l'Occupation du territoire (MAMROT) (minister of municipal affairs and land use)			X		Number of streets with planted borders
Côte-des-Neiges–Notre-Dame-de-Grâce	Greening of new curb extensions	Make sure that new curb extensions have a planting trench			X		Number of curb extensions greened

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-des-Neiges–Notre-Dame-de-Grâce	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	Take advantage of the various funding programs Supralocal program for Le Manoir (2016-2017) Plans and specifications			X	X	Number of air-conditioned facilities
Côte-des-Neiges–Notre-Dame-de-Grâce	Plan to extend activity schedules (pools, wading pools and splash pads)	Increase the number of splash pads and increase the time period during which citizens have access to them		X		X	Number of added hours, splash pads and wading pools
Côte-des-Neiges–Notre-Dame-de-Grâce	Maintain green roofs and plan for similar solutions in future projects	Take advantage of the various funding programs			X		Number of green roofs Attendance Promotion
Côte-Saint-Luc	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Municipal Bylaw 2217, Article 4-4-6 establishes that 50% of the land must be grassed		X			Adoption of the bylaw
Côte-Saint-Luc	Plant, conserve and protect trees – Greening	3,509 trees (April 2015)		X			Tree report
Côte-Saint-Luc	Favour the use of reflective and permeable materials	Use crushed rocks at the snow disposal site				X	Number of projects where reflective and permeable materials have been used
Dollard-Des Ormeaux	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw
Dollard-Des Ormeaux	Plant, conserve and protect trees – Greening – Increase the canopy					X	Tree report
Dollard-Des Ormeaux	Add green walls to certain public buildings – Greening					X	Square metres (m^2) of walls built
Dollard-Des Ormeaux	Reduce soil sealing and the efects of heat caused by roofs					X	Adoption of and/or change to a bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dollard-Des Ormeaux	Enhance regulatory provisions in order to specify coverings with a minimal Solar Reflectance Index (SRI)					X	Adoption and/or change of a bylaw
Dollard-Des Ormeaux	The city adopted a bylaw on tree maintenance and protection. This bylaw applies to private front and side yard trees as well as to public trees along streets, in parks, in green spaces and in wooded areas	Bylaw 2007-023	X				Application of the bylaw
Dollard-Des Ormeaux	Regulations were developed on the percentage of green surface area that must be included in all new constructions	Bylaw 82-704 (zoning) Bylaw 99-875 (site planning and architectural integration program (SPAIP)) Bylaw 97-851 (unified development program)	X				Application of the bylaw
Dollard-Des Ormeaux	Policy applied for a year now to work against industrial building heat islands. Plant cover is required as part of renovation and construction		X				Application of the bylaw
Dorval	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands					X	Number of white or green roofs installed
Dorval	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions					X	Adoption of the bylaw
Dorval	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands					X	Adoption of the bylaw
Dorval	Plant, conserve and protect trees – Greening			X		X	Tree report

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dorval	Favour the use of reflective and permeable materials					X	Number of projects where reflective and permeable materials have been used
Kirkland	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new industrial, commercial and institutional establishment constructions (ICI)	Adopt regulations on the minimum percentage of green surface area for all industrial, commercial and institutional establishments by 2020				X	Adoption of the bylaw
Kirkland	Favour the construction and renovation of roofs (public and private buildings) that help reduce heat islands	Build two white or green roofs on the territory of the ville de Kirkland by 2020				X	Number of white or green roofs installed
Kirkland	Raise awareness among businesspeople and the population about the sustainable construction of parking lots – BNQ standard 3019-190 to control heat islands	Systematically educate each person or business that wishes to construct a parking lot				X	Number of people reached
Kirkland	Plant, conserve and protect trees	Plant 100 new trees a year and systematically replace each tree cut down through 2020		X			Annual tree planting report
Kirkland	Create green walls	Create 100 m^2 of green walls by 2020			X		Square metres (m^2) of walls built
Kirkland	Favour the use of reflective and permeable materials	Use reflective and permeable materials in three municipal projects by 2020				X	Number of projects
Lachine	Continue to replace the roofs of municipal buildings with roofs that feature higher eco-friendly performance, such as white roofs, when the situation permits	A green roof and a grey roof in 2014 Carry out new construction of the Lachine library	X				Number of green and grey roofs
Lachine	Construct a cooling island at parc Dixie (remove asphalt, green, plant trees and create relaxation areas)	Replace 850 m^2 of asphalt with grass in 2009	X				New surface without asphalt in square metres (m^2)

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Lachine	Implement the Îlot de fraîcheur de Lachine (Lachine cooling island) project as part of the Plan d'action 2006-2012 sur les changements climatiques (PACC) (2006-2012 climate change action plan – in French only) piloted by GRAME (planting, roof building, alleys, green walls and parking lots)	Planted 200 trees in 2011 Trees and shrubs planted on a cost-plus basis including four trees planted in trenches along the parking lot on 8e Avenue and rue Notre-Dame	X				Number of trees planted
LaSalle	Replace roofs with white or green roofs when they are renovated			X			Square metres (m^2) of white or green roofs
LaSalle	Plant trees and shrubs on streets and in schoolyards, parks and industrial areas			X			Number of trees planted
LaSalle	Reduce paved surfaces when renovating streets			X			Paved surfaces in square metres (m^2)
LaSalle	Remove paved pathways in parks when they are being revamped			X			Kilometres (km) of paved paths
LaSalle	Standards for landscaping around buildings	To revise			X		Adoption of new standards
LaSalle	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands					X	Number of white or green roofs installed
LaSalle	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Revise the bylaw				X	Adoption of the bylaw
LaSalle	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Revise the bylaw				X	Adoption of the bylaw
LaSalle	Plant, conserve and protect trees – Greening	Carry out an inventory of private trees				X	Tree report
LaSalle	Create green alleys – Greening	Parallel alleys are not mineralized (minority of alleys). Perpendicular alleys are mineralized (grass, stones)				X	Number of green alleys

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Build green walls – Greening	When possible as part of reconstruction projects				X	Square metres (m^2) of walls built
LaSalle	Favour the use of reflective and permeable materials			X			Number of projects where reflective and permeable materials have been used
LaSalle	Plant several species of trees				X		Number of trees planted
Le Plateau-Mont-Royal	Green the Laurier public space	600 m^2 of planted trenches 50 trees planted	X				Number of trees planted and tree trenches greened
Le Plateau-Mont-Royal	Propose a change to the urban planning bylaw that aims to control urban heat islands and improve the percolation of rainwater (prohibit the use of roof coverings with a Solar Reflectance Index (SRI) of below 56 for all new constructions and expansions, and prohibit the use of asphalt and all soil coverings with an SRI below 29)	Adopt and apply the bylaw				X	Number of projects submitted
Le Plateau-Mont-Royal	Change the bylaw on the site planning and architectural integration program (SPAIP)	Adopt and apply the bylaw				X	Application of the bylaw
Le Plateau-Mont-Royal	Propose a change to the urban planning bylaw that aims to control urban heat islands and improve the percolation of rainwater: – Regulate the sustainable construction of parking lots – Require that trees be planted	Adopt and apply the bylaw				X	Number of trees planted
Le Plateau-Mont-Royal	Plant, conserve and protect trees – Greening	350 trees per year		X			Number of trees planted
Le Plateau-Mont-Royal	Transform asphalted alleys into green alleys	40 alleys transformed	X				Number of green alleys
Le Plateau-Mont-Royal	Create green walls on our own buildings and fences when possible	Three walls created	X				Number of projects carried out

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Plateau-Mont-Royal	Carry out active transportation projects that favour ground surfaces and greened curb extensions	Five projects underway		X			Number of projects carried out
Le Plateau-Mont-Royal	Construct greened curb extensions	40 curb extensions constructed	X				Number of curb extensions constructed
Le Sud-Ouest	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands (light-coloured roofs)	Already in place (for light-coloured roofs)		X			Adoption of regulatory changes
Le Sud-Ouest	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Already put into place		X			Application of the bylaw
Le Sud-Ouest	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Analyze the regulations and make changes to them if necessary				X	Adoption of the bylaw
Le Sud-Ouest	Plant, conserve and protect trees – Greening	Plant 8,900 trees by 2025		X		X	Tree report
Le Sud-Ouest	Create green alleys – Greening	Green more alleys: – Ruelle de l'arbre fort (Desnoyers), first green alley in Saint-Henri – Construct two green alleys (Blanchard and Charon-Bourgeoys with flower containers) – Six green alleys closed to traffic	X	X		X	Number of green alleys created
Le Sud-Ouest	Build green walls – Greening	Favour as part of specific projects				X	Number of projects where green walls are used
Le Sud-Ouest	Favour the use of reflective and permeable materials	Favour as part of specific projects				X	Number of projects where reflective and permeable materials are used
Le Sud-Ouest	Mullins cooling island (École Charles-Lemoyne)	Increase the surface area that reflects heat	X				Surface area that reflects the sun's rays

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Construct a pathway using sustainable pavement in parc 3 Nord (rue Basin)	The project's call for bids was launched in February 2015. The objective is to complete the project			X		Length of the path
Le Sud-Ouest	Increase vegetation	In the Saint-Pierre woonerf	X				Increase the planted surface
Le Sud-Ouest	Landscape the Angrignon berm		X				Green surface area in square metres (m^2)
Le Sud-Ouest	Put a bylaw into place on roof construction and renovation (of public and private buildings) that favours the reduction of heat islands (light-coloured roofs)	Already in place	X				Application of the bylaw
Le Sud-Ouest	Put a bylaw into place on the percentage of green surface area (plants, trees, shrubs, etc.) that must be included in all new constructions	Already in place	X				Application of the bylaw
L'Île-Bizard–Sainte-Geneviève	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Percentage observed	X				Adoption of the bylaw
L'Île-Bizard–Sainte-Geneviève	Plant, conserve and protect trees – Greening	Adopt a bylaw on cutting down trees	X				Tree report
Mercier–Hochelaga-Maisonneuve	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Urban Development Bylaw 01-275, effective as of 2012, has a requirement for white or green roofs	X				Number of white or green roofs installed
Mercier–Hochelaga-Maisonneuve	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Urban Development Bylaw 01-275, effective as of 2012, has a requirement for new constructions specifying 20% planted surface	X				Adoption of the bylaw
Mercier–Hochelaga-Maisonneuve	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Urban Development Bylaw 01-275, effective as of 2012, contains a number of requirements that are compatible with the standard; greening and/or use of surface coverings with low Solar Reflectance Index (SRI)	X				Adoption of the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mercier–Hochelaga-Maisonneuve	Plant, conserve and protect trees – Greening	On streets: 330 trees/year + the number of trees required as part of the canopy project In parks: +/- 100 trees/year		X			Tree report
Mercier–Hochelaga-Maisonneuve	Create green alleys – Greening	Eight per year				X	Number of alleys
Mercier–Hochelaga-Maisonneuve	Change the regulations to favour the installation of green roofs (flat or sloped) for all new building developments	Bylaw 01-275 effective since 2012 – Green and white roofs	X				Application of the bylaw
Mercier–Hochelaga-Maisonneuve	Promote the installation of green walls	In collaboration with the graffiti operations and the Éco-quartier program		X			Square metres (m^2) of walls built
Montréal-Est	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Adopt a bylaw such as: When a flat roof is being completely renovated or a new flat-roofed building is being built (public or private), the owner is required to install a roof covering that favours the reduction of urban heat islands. That could be a: – green roof; – white material, or material painted white or covered in reflective coating or white ballast; – material whose Solar Reflectance Index (SRI) is at least 78, attested by the manufacturer's specifications; – a combination of the above.				X	Number of white or green roofs installed
Montréal-Est	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Adopt a bylaw such that, for all new constructions and all renovations to the exterior of a building, all land surface that is not occupied by a building, a parking area, a patio, a sidewalk or a building entrance must be planted				X	Adoption of the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Est	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	For ICIs (industrial, commercial and institutional establishments) only, adopt a bylaw based on BNQ standard 3019-190 to control heat islands, which would require, for a parking lot of 20 or more spaces: – that 40% of the parking lot's surface be covered by a canopy; – that the minimum size of a space be reduced to 2.60 x 5.75 metres; – that, above 125% of the minimum number of parking spaces, the spaces must be underground or part of a multi-level parking garage				X	Adoption of the bylaw
Montréal-Est	Plant, conserve and protect trees – Greening	Develop a master plan to increase the canopy by 25% in keeping with the agglomeration's Schéma (Montréal urban agglomeration land use and development plan)				X	Tree report
Montréal-Nord	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Under study for inclusion in our urban planning bylaw				X	Number of white or green roofs installed
Montréal-Nord	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Zoning bylaw		X			Adoption of the bylaw
Montréal-Nord	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Several projects carried out in 2014-2015		X			Adoption of the bylaw
Montréal-Nord	Plant, conserve and protect trees – Greening	Protect trees during construction work Require mandatory planting for new constructions and expansions Maintain trees		X			Tree report
Montréal-Nord	Create green alleys – Greening					X	Number of alleys

Adaptation measures for heat waves: Mitigate heat islands

BRIEF 3.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Nord	Build green walls – Greening					X	Square metres (m^2) of walls built
Montréal-Nord	Favour the use of reflective and permeable materials					X	Number of projects where reflective and permeable materials have been used
Montréal-Ouest	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	The bylaw sets the percentage at 60%		X			Adoption of the bylaw
Montréal-Ouest	Plant, conserve and protect trees – Greening	Have the city council adopt a municipal tree policy	X				Tree report
Mont-Royal	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Adopt a municipal bylaw				X	Number of white or green roofs installed
Mont-Royal	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions		X				Adoption of the bylaw
Mont-Royal	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands		X				Adoption of the bylaw
Mont-Royal	Plant, conserve and protect trees – Greening	Green the industrial sector				X	Tree report
Mont-Royal	Favour the use of reflective and permeable materials		X				Number of projects where reflective and permeable materials have been used
Mont-Royal	Create green infrastructures (plant walls)	Possibly expand the infrastructures in place	X		X		Square metres (m^2) of walls built
Mont-Royal	Replace perennials with annuals in parks			X			

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mont-Royal	Municipal bylaw – backyard green space		X				Application of the bylaw
Mont-Royal	Municipal bylaw – cutting down trees		X				Application of the bylaw
Mont-Royal	Industrial park greening project	Underway in 2015			X		Square metres (m^2) of greening
Mont-Royal	Plant various species of trees and shrubs on public lands as well as alongside streets			X	X		
Outremont	Plan to install white roofs for municipal buildings when renovating or during construction	One building: roof of the Centre culturel intergénérationnel in 2014	X				Number of municipal buildings with white roofs
Outremont	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Adopted in February 2015	X				Application of the bylaw
Outremont	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Minimum green surface area between 10 and 35% depending on the area and type of building	X				Application of the bylaw
Outremont	Plant, conserve and protect trees – Greening	± 7,000 on public land (streets and parks) 90 trees are planted each year		X			± 7,000 on public land (streets and parks)
Outremont	Create green alleys – Greening	Based on citizen demand		X			Two alleys
Outremont	Favour the use of reflective materials	One building: roof of the Centre culturel intergénérationnel in 2014	X				Number of municipal buildings with reflective materials
Pierrefonds-Roxboro	Change the regulations to require pale roofs on buildings with flat or gently sloped roofs	Bylaw CA290040	X				Application of the bylaw
Pierrefonds-Roxboro	Increase tree planting on public land	± 150 trees/year Tree plan to come		X		X	Number of trees

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pierrefonds-Roxboro	Distribute native tree seedlings	By the Éco-quartier on gardening day		X			Number of seedlings distributed
Pierrefonds-Roxboro	In partnership with CRÉ Montréal, greening project for the borough's biggest heat islands	Verify eligibility				X	Square metres (m^2) of greening
Pierrefonds-Roxboro	Initiate measures to encourage the replacement of trees that have been cut down with a permit	Include in the tree plan				X	Confirmation of 100% of replacements
Pierrefonds-Roxboro	Regulate open planted spaces around residences	50% in the front yard	X				Number of corrections obtained
Pointe-Claire	Favour the construction or renovation of roofs (public or private buildings) that help reduce heat islands	Continue to encourage the use of white and green roofs for new constructions, according to the site planning and architectural integration program (SPAIP)		X			Number of white or green roofs installed
Pointe-Claire	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Change the zoning bylaw	x				Adoption of the bylaw
Pointe-Claire	Regulate the sustainable construction of parking lots	Analyze of the regulations and changes to them if necessary			x		Adoption of the bylaw
Pointe-Claire	Favour the creation of green walls when parks are landscaped	Green wall pilot project near private properties when landscaping parks				x	Square metres (m^2) of walls built
Pointe-Claire	Plant, conserve and protect trees – Greening	Increase the canopy from year to year		x			Tree inventory
Pointe-Claire	Maintain the green roof and plan similar solutions for future projects	Maintain the green roof on the public works building and plan similar ones for future projects in order to mitigate heat islands		x			Number of green roofs installed
Pointe-Claire	Pilot project using reflective and permeable materials	Carry out a pilot project of such products based on their market availability				x	Number of projects using reflective and permeable materials

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rivière-des-Prairies–Pointe-aux-Trembles	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Change the zoning bylaw				X	Number of white or green roofs installed
Rivière-des-Prairies–Pointe-aux-Trembles	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Change the zoning bylaw				X	Adoption of the bylaw
Rivière-des-Prairies–Pointe-aux-Trembles	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Change the zoning bylaw				X	Adoption of the bylaw
Rivière-des-Prairies–Pointe-aux-Trembles	Plant, conserve and protect trees – Greening	Apply systematically in our projects		X			Tree report
Rivière-des-Prairies–Pointe-aux-Trembles	Favour the use of reflective and permeable materials	Change the zoning bylaw				X	Number of projects where reflective and permeable materials have been used
Rivière-des-Prairies–Pointe-aux-Trembles	Plant a minimum of around 300 trees per year. The plan of 600 trees per 2013 was made possible by the Plan d'action canopée 2012-2021 (canopy action plan 2012-2021 – in French only)	545 trees were planted in 2014. However, the canopy action plan will not be available in 2015 for our borough	X				Number of trees planted
Rivière-des-Prairies–Pointe-aux-Trembles	Progressively revise the regulations to include elements that contribute to greening and controlling heat islands, mainly for new building and development projects, applicable, for instance, to parking lots					X	Adoption of the bylaw
Rosemont–La Petite-Patrie	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands: change the urban planning bylaw to require white or green roofs for all new constructions and complete roof renovations	Since November 2014, the installation of asphalt and gravel roofs has been forbidden for flat roofs. This provision made it possible to install 1,500 white roofs (new constructions and renovations) since January 2011	X				Number of white or green roofs installed

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rosemont–La Petite-Patrie	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands: change the urban planning bylaw to require that at least 20% of land surface area for new projects must be planted	This change made it possible to plant 30,000 m². In November 2014, the borough council adopted a draft bylaw boosting our greening efforts to 25%, except in areas authorized for principal usage categories such as family, business or industry, whose maximum authorized coverage rate is 85% and up. This draft bylaw proposes to correlate greening efforts to the maximum coverage rate. As a result, the percentage of greening would be 25% when the maximum coverage rate is 65% and up, 30% when the maximum coverage rate is above 50% but below 65%, and increased to 35% in areas where the maximum coverage rate is below 50%		X			Adoption of the bylaw Number of square metres (m²) of greened surface
Rosemont–La Petite-Patrie	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions: change, in January 2011, to an urban planning bylaw aiming to respect the BNQ standard on parking Lutte aux îlots de chaleur urbains – Aménagement des aires de stationnement (controlling urban heat islands – parking lot construction)	These changes aim to include a minimum greening rate of 15% for parking lots with 10 spaces and up, to include underground parking for buildings with nine or more units, and to prescribe non-reflective surface covering materials for parking, warehousing and loading lots	X				Adoption of the bylaw
Rosemont–La Petite-Patrie	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions: in May 2013, changed the urban planning bylaw aiming to increase plant cover in the borough	Require that all yards with more than a metre of space between the building façade and the street provide plant cover	X				Adoption of the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rosemont–La Petite-Patrie	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions. Since 2011, changes have been included in the bylaw following the adoption of the Tree Policy which stipulates that the boroughs should adopt or change standards on cutting down trees on private land	The new regulatory provisions strengthen the rules about cutting down trees on all private land. They set out the situations in which a tree may be cut down, require that new trees be planted when a tree is cut down without authorization, and prohibit the installation of an accessory building if it would require cutting down a tree, unless no accessory building smaller than 15 m^2 can be added. The provisions include higher requirements in terms of tree planting and preservation when a permit is requested for a new construction or an expansion (one tree per 50 m^2 of unbuilt land instead of one tree per 200 m^2). We added criteria specific to the site planning and architectural integration program (SPAIP) in order to provide maximum plant coverage and favour the preservation of mature trees, on both public and private land	X				Adoption of the bylaw
Rosemont–La Petite-Patrie	Create green alleys	In 2010, the borough put into place a program to fund green alley projects every year and to support citizen committees in collaboration with the Éco-quartier	X				Number of green alleys
Rosemont–La Petite-Patrie	Increase the canopy	Since 2012, the borough has taken part in the Plan d'action canopée 2012-2021 (canopy action plan 2012-2021). From 2012 to 2014, 1,519 trees were planted (parks and streets)	X	X			Joining the canopy program Tree report
Rosemont–La Petite-Patrie	Build green curb extensions	Total green curb extensions: 83 built + 147 to come (2015)		X			Number of green curb exensions
Rosemont–La Petite-Patrie	Favour sidewalk construction with sidewalk buffers as part of the borough's renovation program for the arterial network	Total sections with sidewalk buffers: 23 (+ five in 2015)	X	X			Number of sections with sidewalk buffers

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rosemont–La Petite-Patrie	Build street gardens. Since 2010, every spring, we carry out the Jardin de rue (street garden) project, which consists of citizens removing the ashpalt that covers old sidewalk buffers and planting gardens there instead.	Total: 14 sections* with street gardens * Section = portion of a street between two intersections	X				Number of sections with street gardens
Rosemont–La Petite-Patrie	Since 2009, we have held an annual distribution of perennials to citizen groups (citizen committees for green alley, street gardens, housing cooperatives, organizations, etc.)	Each year, an average of 4,250 perennials are provided to some one hundred groups		X			Number of perennials distributed Number of groups signed up
Rosemont–La Petite-Patrie	Encourage private owners to take part in planting trees on private land via the Un arbre pour mon quartier (a tree for my neighbourhood) campaign in collaboration with the Éco-quartier Rosemont–La Petite-Patrie	Total: 2013/2014 – 148 trees planted on private properties		X			Number of trees planted
Sainte-Anne-de-Bellevue	Preserve plants and greenery on the bike path by expanding the planting of fruit trees along the path		X				Number of fruit trees planted
Saint-Laurent	Adopt an urban forestry plan	Plan adopted in 2009	X				Application of the plan
Saint-Laurent	Create the Révélez votre nature (reveal your nature) greening campaign for the business community, which made it possible to plant 1,354 trees and shrubs as of June 2011	Encourage and support businesses in planting trees on their sites. From 2008 to 2012, 624 trees and 766 shrubs were planted as part of the campaign		X			Number of businesses and number of plants planted
Saint-Laurent	Create new green spaces in current and developing neighbourhoods	Bois-Franc and Nouveau Saint-Laurent neighbourhoods		X			Number of green spaces
Saint-Laurent	Maintain the Un enfant, un arbre (one child, one tree) program launched in 2010			X			Number of citizens reached

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Plant trees in an effort to control heat islands and as part of the forestry plan	Planted 1,298 trees in 2009, 1,022 trees in 2010, 341 trees in 2011, 957 trees in 2012, 929 trees in 2013 and 528 trees in 2014	X				Number of plants planted
Saint-Laurent	Continue to landscape and maintain the woods in parc Marcel-Laurin			X			
Saint-Laurent	Continue greening work on parc Philippe-Laheurte			X			Square metres (m^2) of greening
Saint-Laurent	Create a cooling island aiming to educate citizens about the difference between the temperature above boul. Cavendish and that of the cooling island (giant thermometer)	Plant 15 trees and 300 shrubs	X				Number of trees planted
Saint-Laurent	Promote and encourage the construction and renovation of greener buildings on our territory according to recognized environmental certification programs: replace by white and green roofs	Raise awareness among businesspeople to adopt sustainable construction and landscaping practices		X			Number of white and green roofs
Saint-Laurent	Continue the eco-friendly management of green spaces and natural environments in the Dr-Bernard-Paquet and Guillaume-Bruneau parks			X			
Saint-Laurent	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Adopt Bylaw RCA08-08-0001-76 requiring a green roof or a roof covered in material with a Solar Reflectance Index of at least 78 for all flat or gently sloped roofs Use development agreements to require green roofs			X		Adoption of the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Strengthen existing standards relative to the requirement to include green space and to plant trees on private land Adopt Bylaw RCA08-08-0001-78 in 2015			X		Adoption of the bylaw
Saint-Laurent	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Strengthen existing standards relative to parking Adopt Bylaw RCA08-08-0001-78 in 2015			X		Adoption of the bylaw
Saint-Laurent	Plant, conserve and protect trees – Greening	Produce a report about trees planted on private land		X		X	Tree report
Saint-Laurent	Plant, conserve and protect trees – Greening	Adopt Bylaw RCA08-08-0001-78, which requires increased planting				X	Adoption of the bylaw
Saint-Laurent	Create green alleys – Greening	In 2015-2016, renovate rue De Londres and rue Stanislas in the Norvick area to reduce mineralized surfaces			X		Number of green alleys
Saint-Laurent	Build green walls – Greening	Require that green walls be included in certain projects (ex.: Projet Mazda)				X	Square metres (m^2) of walls built
Saint-Laurent	Favour the use of reflective and permeable materials	Adopt Bylaw RCA08-08-0001-78 in 2015 requiring parking lots to have permeable surfaces and a high reflectance indicator			X		Adoption of the bylaw
Saint-Laurent	Increase the number of plant species planted in order to favour tree biodiversity	Six different species planted in 2007 and 58 in 2013	X				Number of plant species
Saint-Léonard	Create green alleys – Greening	Landscape the public alley located between Jean-Talon, de Pontoise, le Maître and L'Assomption		X			Number of green alleys created
Saint-Léonard	Plant, conserve and protect trees – Greening	– Arboretum in parc La Dauversière – Parc Wilfrid-Bastien (behind the Éco-quartier) – Parc Giuseppe-Garibaldi – Planting as part of the canopy action plan – Planting as part of other projects		X		X	Number of trees planted

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Léonard	Carry out an analysis of regulations on the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Carry out an analysis of regulations			X		Analysis report
Saint-Léonard	Carry out an analysis of regulations for the sustainable construction of parking lots for industrial, commercial and institutional establishments	Carry out an analysis of regulations			X		Analysis report
Saint-Léonard	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Apply the bylaw		X			Number of white or green roofs installed
Senneville	Regulate the sustainable construction of parking lots to control heat islands					X	Adoption of the bylaw
Verdun	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Change and apply the bylaw			X		Number of white or green roofs installed
Verdun	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Change and apply the bylaw			X	X	Adoption of the bylaw
Verdun	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Change and apply the bylaw	X			X	Adoption of the bylaw
Verdun	Plant, conserve and protect trees – Greening	Increase the number of trees planted by 10% per year			X		Tree report
Verdun	Create green alleys – Greening	Reduce heat islands and improve the living environment for and with citizens: two green alleys created in 2015	X	X		X	Number of green alleys

Adaptation measures for heat waves: Mitigate heat islands

BRIEF 3.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Verdun	Favour the use of reflective and permeable materials	Change and apply the bylaw			X		Number of projects where reflective and permeable materials have been used
Ville-Marie	Adapt regulatory tools and landscaping criteria in order to maximize greening and heat island control, mainly for parking lots, roofs and terraces, new developments, public and private land, etc.	Apply the objectives and criteria when submitting development or site requalification applications		X			Number of projects
Ville-Marie	Complete the section of the urban planning bylaw dealing with the environment and sustainable development: white and green roofs, urban agriculture areas, etc.	Apply bylaw		X			Number of white or green roofs installed
Ville-Marie	Measures to protect and maintain trees	Apply bylaw		X			Number of inspections
Ville-Marie	Plant, conserve and protect trees – Greening	Plant trees for each unbuilt 150-m^2 section		X			Number of trees planted
Ville-Marie	Plant trees, create green alleys						Number of green alleys
Ville-Marie	Increase the canopy by 20 to 25% by 2025				X		Number of trees planted
Villeray–Saint-Michel–Parc-Extension	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Apply Bylaw 01 283-75	X				Number of white or green roofs installed
Villeray–Saint-Michel–Parc-Extension	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Apply Bylaw 01 283-75	X				Adoption of the bylaw
Villeray–Saint-Michel–Parc-Extension	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	Apply Bylaw 01 283-75	X				Adoption of the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Villeray–Saint-Michel–Parc-Extension	Plant, conserve and protect trees – Greening	Plant 600 trees per year		X			Tree report
Villeray–Saint-Michel–Parc-Extension	Create green alleys – Greening	Build six green alleys per year		X			Number of alleys
Villeray–Saint-Michel–Parc-Extension	Favour the use of reflective and permeable materials	Apply Bylaw 01 283-75	X				Number of projects where reflective and permeable materials have been used
Villeray–Saint-Michel–Parc-Extension	Adopt a bylaw to make it mandatory, as part of renovations and new constructions, to use roof coverings that help reduce urban heat islands	Bylaw 01283-20 adopted	X				Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Centre Patro Le Prévost: the four roof basins will be covered with a white elastomer membrane, which will help reduce urban heat islands	Bylaw 01283-20 adopted			X		Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Change the bylaw on the site planning and architectural integration program (SPAIP) to incorporate criteria that favour the collection, retention and seepage of rainwater and the reduction of heat islands	Bylaw 01283-20 adopted	X				Application of the bylaw
Westmount	Regulate the construction and renovation of roofs (public and private buildings) to favour the reduction of heat islands	Create the details for the *Guide #3 toiture du règlement 1305* (guide #3 on roofing for Bylaw 1305) (site planning and architectural integration program (SPAIP))	X				Number of white or green roofs installed
Westmount	Regulate the percentage of green surface area (plants, trees, shrubs, etc.) that must be built into all new constructions	Bylaw 1303 (zoning) and *Guide #6 aménagement paysager* (guide #6 landscaping) for Bylaw 1305 (site planning and architectural integration program (SPAIP)) Conduct a weekly analysis of all landscaping projects by the inspections bureau and the Planning Advisory Committee	X				Application of the bylaw

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Westmount	Regulate the sustainable construction of parking lots – BNQ standard 3019-190 on controlling heat islands	*Guide #6 aménagement paysager* (guide #6 landscaping) for Bylaw 1305 (site planning and architectural integration program (SPAIP)) Conduct a weekly analysis of all landscaping projects by the inspections bureau and the Planning Advisory Committee	X				Application of the bylaw
Westmount	Plant, conserve and protect trees – Greening		X				Tree report
Westmount	Favour the use of reflective and permeable materials	*Guide #6 aménagement paysager* (guide #6 landscaping) for Bylaw 1305 (site planning and architectural integration program (SPAIP)) Conduct a weekly analysis of all landscaping projects by the inspections bureau and the Planning Advisory Committee	X				Number of projects where reflective and permeable materials have been used
Westmount	Examine the possibility of offering bonuses to incite people to create roof gardens for urban agriculture purposes					X	
Westmount	Carry out pilot projects calling for green roofs on municipal buildings	The new recreation centre is built underground to LEED gold level	X				
Westmount	Create a program aiming to encourage residents to beautify and green their alleys and entrances	Bylaw 1303 and *Guide #6 aménagement paysager* (guide #6 landscaping) for Bylaw 1305 (site planning and architectural integration program (SPAIP))	X				
Westmount	Protect the largest trees (those 50 years old and more)	Bylaw 1303 and Schéma (Montréal urban agglomeration land use and development plan)			X		Number of actions taken

Adaptation measures for heat waves

PROVIDE SPACES FOR PEOPLE TO COOL OFF AND AVOID EXPOSURE TO OPPRESSIVE HEAT (COOLING ISLANDS)

Benefits

- Provides a place of respite for vulnerable people during oppressive heat
- Helps reduce the intra-urban heat island effect in areas immediately surrounding the cooling island, as well as contributing to citizens' overall comfort

Potential co-benefits

- Preservation of biodiversity and improvement of living environments
- Increased percentage of rainwater infiltration into the ground and subsequent slowing of runoff (adaptation to heavy rainfalls)
- Under some conditions, reduction of problems associated with the drying out of clay soils

Constraints and maladaptation risks

- For greening projects, make sure the plants chosen are adapted to the environment (in terms of sun, water and nutrient needs, and exposure to wind and de-icing salts) and to the site's usage
- Starting at a project's design phase, plan for a maintenance program to ensure the longevity of investments

Why?

Cooling islands help cool off the surrounding air thanks to the presence of vegetation or water bodies and can also provide protection from the sun's rays.

These spaces can take various forms, including parks, gardens, shelters and green structures (greened roofs and walls). They can even be lines of trees along the street that create shaded areas. They can also consist of spaces with water basins, fountains, pools, misters and so forth. These are all elements that can help create spaces to ensure better quality of life for citizens who are exposed to oppressive heat.

What we can do

- Conserve, protect and create green spaces
- Create green alleys
- Create shaded areas
- Choose construction materials with a high albedo (which can help reflect the sun's rays more instead of absorbing them)
- Increase public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and ensure a good level of service
- Increase the number of air-conditioned public spaces and extend service during heat waves (libraries, community centres, etc.)

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la diversité sociale et des sports (social diversity and sport department)	Plan d'intervention aquatique de Montréal 2013-2025 (Montréal aquatic action plan 2013-2015 – in French only)	Have an adequate number of outdoor water basins (pools, wading pools and splash pads) for playing, swimming and cooling off during the increasingly frequent heat waves, such that we meet the needs of the entire Montréal population, particularly people with reduced mobility Introduce wading pools and splash pads as necessary equipment within mitigation measures adopted Montréal during heat waves	X	
Service de la diversité sociale et des sports (social diversity and sport department)	Integrated urban revitalization program (IUR)	**IUR Territoire Nord-Est** (Montréal-Nord): Greening project for the edges of five school playgrounds in order to create cooling islands	X	
	Plan de l'eau (2015) (water plan (2015) – in French only)	This plan includes a number of projects to reopen citizen access to water, including the construction of a harbour bath, the Plage de l'Est (urban beach at the east end of the Island of Montréal), etc.	X	

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Plant trees in urban projects	Increase tree planting when possible in urban projects		X			Number of trees planted per project
Ahuntsic-Cartierville	Include water in urban projects	Favour infrastructure designs that permit the presence of water in urban projects		X			Number of projects including water
Ahuntsic-Cartierville	Consolidate and increase public facilities that provide access to the banks of rivière des Prairies	Projects as part of the parcours Gouin				X	Number of new public facilities
Ahuntsic-Cartierville	Favour the accessibility of public facilities that provide access to the banks of rivière des Prairies	Plan the standardization of facilities favouring universal accessibility		X			List of projects carried out
Ahuntsic-Cartierville	Install temporary splash pads during heat waves in some parks	Use fire hydrants and water supply outlets in the parks		X			Number of temporary splash pads
Anjou	Plant, conserve and protect trees – Greening	The borough projects that we will plant an annual average of 100 trees, increasing the canopy from year to year		X			Tree report
Anjou	Build shaded areas	Construct commercial parking lots and land surrounding industrial buildings that include green islands and rest areas		X			Number of shaded areas built
Anjou	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	The borough is already equipped with splash pad structures (wading pools, pools) in most of its parks				X	Number of new public facilities
Anjou	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	The community centre is air-conditioned and its opening hours are extended during heat waves. Depending on needs, municipal buildings are available according to the severity of the situation		X			Number of public spaces adapted
Baie-D'Urfé	Plant trees – street greening			X			Number of trees planted

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Baie-D'Urfé	Maintain the city's green spaces			X			Number of actions taken
Beaconsfield	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	The library, the recreation centre and the Beaconsfield shopping mall are the three main sites where the population can go to cool down	X				Number of air-conditioned public spaces
Côte-des-Neiges–Notre-Dame-de-Grâce	Plant, conserve and protect trees – Greening	Plant 5,600 trees by 2021 (canopy action plan)				X	Tree report
Côte-des-Neiges–Notre-Dame-de-Grâce	Create green alleys – Greening	Citizens have been invited to submit requests for three years now				X	Number of green alleys
Côte-des-Neiges–Notre-Dame-de-Grâce	Created shaded areas	Apply systematically in our projects				X	Number of shaded areas built
Côte-Saint-Luc	Plant, conserve and protect trees – Greening	3,509 trees (April 2015)		X			Tree report
Côte-Saint-Luc	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	12 air-conditioned municipal buildings (April 2015: city hall, library, arena, public works, chalets 1 and 3 at Pierre Elliott Trudeau Park, chalet at parc Rembrandt, recreation centre, Aquatic and Community Centre (ACC), Gymnasium, fire station, Emergency Medical Services (EMS))		X			Number of public spaces adapted
Dollard-Des Ormeaux	Plant, conserve and protect trees – Greening			X		X	Tree report
Dollard-Des Ormeaux	Create shaded areas in parks					X	Number of shaded areas built
Dollard-Des Ormeaux	Install public splash pads					X	Number of new public facilities that provide access to water
Dollard-Des Ormeaux	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, outdoor and indoor pools, etc.)					X	Number of air-conditioned public spaces

Adaptation measures for heat waves:
Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dorval	Plant, conserve and protect trees – Greening			X			Tree report
Dorval	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage			X		X	Number of new public facilities that provide access to water
Kirkland	Plant, conserve and protect trees	Plant 100 new trees each year and systematically replace each tree cut down from now to 2020			X		Annual tree planting report
Kirkland	Create shaded areas in public spaces	Maintain current shaded areas and build new ones as needed		X			Number of shaded areas built
Kirkland	Air-condition municipal buildings and plan to extend service during heat waves	Maintain current service and extend it as needed		X			Number of public spaces adapted
Lachine	Install a permanent shelter at the pool at parc Kirkland		X				
LaSalle	The borough has 16 splash pads scattered across its territory		X				Not applicable
LaSalle	The borough has eight outdoor pools	Extend opening hours	X				Not applicable
LaSalle	The two arenas are open in the summertime, so citizens can cool off there			X			Not applicable
LaSalle	Construct a sun shelther at the L'Octogone library	Need identified by users		X			Number of shaded areas built
LaSalle	The borough's city hall is a space identified as accessible to citizens			X			Not applicable
LaSalle	Construct sun shelters in the parks		X				Number of shaded areas built
LaSalle	Construct a number of shelters along the river banks		X				Number of shaded areas built

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Plant, conserve and protect trees – Greening	Complete the tree inventory for parks				X	Tree report
LaSalle	Create green alleys – Greening					X	Number of green alleys
LaSalle	Construct shaded areas	We have constructed nearly 10 sites		X			Number of shaded areas built
LaSalle	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Already done: eight outdoor pools, one indoor pool and 16 splash pads	X				Number of new public facilities that provide access to water
LaSalle	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)		X				Number of air-conditioned public spaces
Le Plateau-Mont-Royal	Plant, conserve and protect trees – Greening	Plant 350 trees per year		X			Number of trees planted
Le Plateau-Mont-Royal	Create green alleys – Greening	Create 40 green alleys by 2020				X	Number of alleys
Le Plateau-Mont-Royal	Propose a change to the urban planning bylaw aiming to control urban heat islands and improve the percolation of rainwater – Regulate the sustainable construction of parking lots – Require that trees be planted	Adopt and apply the bylaw				X	Number of trees planted
Le Plateau-Mont-Royal	De-asphalt a street section to expand a park	600 m^2				X	Square metres (m^2) of asphalt removed
Le Plateau-Mont-Royal	Pilot projects to help people cool off (ex.: Bornéo)	Carry out a cooling-off pilot project by 2020				X	Number of projects
Le Plateau-Mont-Royal	Greening requirement for all café-terrace and parklet projects during the summer	75 café-terraces and parklets per year				X	Number of terraces and parklets

Adaptation measures for heat waves:
Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Sud-Ouest	Plant, conserve and protect trees – Greening	Plant 8,900 trees by 2025				X	Tree report
Le Sud-Ouest	Create green alleys – Greening	Green more alleys: – Ruelle de l'arbre fort (Desnoyers), the first green alley in Saint-Henri – Create of two green alleys (Blanchard and Charon-Bourgeoys with flower pots) – Six green alleys closed to traffic	X	X		X	Number of green alleys created
Le Sud-Ouest	Created shaded areas	Five new parks, one per year				X	Number of shaded areas built
Le Sud-Ouest	Continue to make public facilities available to permit access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Based on demand		X		X	Number of public facilities that provide access to water
Le Sud-Ouest	Continue to have air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	Based on demand		X		X	Number of air-conditioned public spaces
Le Sud-Ouest	Construct the new parc 3 Nord with grassy area				X		Number of shaded areas built
Le Sud-Ouest	Construct the promenade Smith with granite paving stones instead of pavement				X		Number of shaded areas built
Le Sud-Ouest	Convert wading pools into splash pads in the parks: Curé-Albert-Arnold, Oscar-Peterson and 3 Nord				X		Number of new public facilities that provide access to water
L'Île-Bizard–Sainte-Geneviève	Plant, conserve and protect trees – Greening	Bylaw on cutting down trees + planting program – 100 trees per year		X			Tree report
L'Île-Bizard–Sainte-Geneviève	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Renovate Pavillon Vincent-Lecavalier (locker rooms)				X	Number of new public facilities that provide access to water

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
L'Île-Bizard–Sainte-Geneviève	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)		X				Number of public spaces adapted
L'Île-Bizard–Sainte-Geneviève	Plant, conserve and protect trees – Greening	Bylaw on cutting down trees		X			Number of trees planted each year
L'Île-Bizard–Sainte-Geneviève	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Two new facilities				X	Number of public facilities that provide access to water
Mercier–Hochelaga-Maisonneuve	Plant, conserve and protect trees – Greening	On streets: 330 trees/year + the number of trees requested as part of the canopy project In parks: +/- 100 trees/year		X			Tree report
Mercier–Hochelaga-Maisonneuve	Create green alleys – Greening	Create eight green alleys per year		X			Number of green alleys
Mercier–Hochelaga-Maisonneuve	Create shaded areas	One pergola/year in the borough's parks		X			Number of shaded areas built
Mercier–Hochelaga-Maisonneuve	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Construct a splash pad in one park per year		X			Number of new public facilities that provide access to water
Mercier–Hochelaga-Maisonneuve	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	The extreme heat action plan produced jointly by the borough and the civil protection centre includes citizen access to air-conditioned public space based on need during critical events		X			Number of public spaces adapted
Mercier–Hochelaga-Maisonneuve	Install splash pads	Install one splash pad per year		X			Number of splash pads installed
Montréal-Nord	Plant, conserve and protect trees – Greening	Adopt a canopy project		X			Tree report
Montréal-Nord	Create green alleys – Greening					X	Number of green alleys

Adaptation measures for heat waves:
Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Nord	Create shaded areas					X	Number of shaded areas built
Montréal-Nord	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Construction of splash pads in 2015 and 2016		X			Number of new public facilities that provide access to water
Montréal-Nord	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)					X	Number of public spaces adapted
Montréal-Ouest	Plant, conserve and protect trees – Greening	Adopt a municipal tree policy by city council	X				Tree report
Montréal-Ouest	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Construct new splash pads in the city, such as at parc Davies for example			X		Number of new public facilities that provide access to water
Montréal-Ouest	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	Add several air-conditioned municipal facilities open to the public			X		Number of public spaces adapted
Mont-Royal	Plant, conserve and protect trees – Greening	Green the industrial area				X	Tree report
Mont-Royal	Create green alleys – Greening					X	Number of green alleys
Mont-Royal	Create shaded areas		X				Number of shaded areas built
Mont-Royal	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage		X				Number of new public facilities that provide access to water

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mont-Royal	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)		X				Number of public spaces adapted
Mont-Royal	Construct of parks, benches and buildings		X				
Outremont	Plant, conserve and protect trees – Greening	Projects for parc Raoul Dandurand and the Outremont campus ± 7,000 on public land (streets and parks)		X			Number of trees planted
Outremont	Create shaded areas	Landscape avenue Laurier: two areas		X			Number of shaded areas built
Outremont	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Install a splash pad at parc Raoul-Dandurand		X			Number of new public facilities that provide access to water
Outremont	Extend service during heat waves (libraries, community centres, etc.)	Two public spaces adapted: library and Centre culturel intergénérationnel	X				Number of public spaces adapted
Pierrefonds-Roxboro	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Build a public pool in parc D'À-Ma-Baie		X			Completed construction
Pointe-Claire	Plant, conserve and protect trees – Greening	Increase the canopy from year to year		X			Tree inventory
Pointe-Claire	Keep public facilities available that provide access to water and provide service coverage in case of oppressive heat	When the temperature is at or above 33 °C for more than three days and/or the temperature is above 25 °C for two consecutive nights	X				Number of days for which hours have been changed
Pointe-Claire	Provide air-conditioned public spaces and plan to extend service during heat waves (library and aquatic centre) and in case of oppressive heat	The Central Library and aquatic centre stay open when the temperature is at or above 33 °C for more than three days and/or the temperature is above 25 °C for two consecutive nights	X				Number of days for which hours have been changed

Adaptation measures for heat waves:
Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pointe-Claire	Construct a splash pad	Complete at least one project by 2020				X	Number of splash pads installed in parks
Pointe-Claire	Create shaded areas in parks	Complete at least one project by 2020				X	Number of pergolas or other structures installed in parks
Rivière-des-Prairies–Pointe-aux-Trembles	Plant, conserve and protect trees - Greening	Apply systematically in our projects		X			Tree report
Rivière-des-Prairies–Pointe-aux-Trembles	Create shaded areas	Apply systematically in our projects		X			Number of shaded areas built
Rivière-des-Prairies–Pointe-aux-Trembles	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Construct a 50-metre pool				X	Number of wading pools and pools
Rivière-des-Prairies–Pointe-aux-Trembles	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	For all projects in the three-year building program (PTI) that include splash pads or beaches		X			Number of splash pads and beaches
Rivière-des-Prairies–Pointe-aux-Trembles	Increase the capacity of air-conditioned public spaces and extend operating hours during heat waves (libraries, community centres, etc.)	Increase the operating budget		X			Total capacity of air-conditioned public spaces and number of additional operating hours
Rivière-des-Prairies–Pointe-aux-Trembles	Increase the number of public facilities that provide access to water and provide service coverage	Construct a 50-metre outdoor pool (Hans-Selye)		X			Number of new public aquatic facilities
Rivière-des-Prairies–Pointe-aux-Trembles	Optimize the use of air-conditioned public spaces and extend operating schedules during heat waves	The list of available air-conditioned public spaces is updated every year and the availabilities are adapted to needs. In 2014: simultaneous capacity for 2,000 people	X				Total capacity of air-conditioned public spaces and number of additional operating hours

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rosemont–La Petite-Patrie	Construct sun shelters on place Hector-Prud'homme	Installation of a shade screen at place publique Hector-Prud'homme to make the space accessible and suitable for meetings, relaxation and rest	X				Number of shelters built
Rosemont–La Petite-Patrie	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Restoration done in 2013 (one project): 26 concrete drinking fountains replaced Restoration to come (two projects): transformation of wading pools into splash pads at parc de l'Ukraine (in 2017) and parc Père-Marquette (date TBC) New facility to come (one project): splash pads at parc Luc-Durand (2015)	X		X		Number of new construction projects Number of restored construction projects
Rosemont–La Petite-Patrie	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.). Splash pads make for a longer possible usage period each season and per day (mid-May to mid-September from 9 a.m. to 9 p.m. for splash pads versus late June to late August from 10 a.m. to 8 p.m. for filtered pools and wading pools)	We increase the opening hours for filtered pools and wading pools during periods of oppressive heat and our air-conditioned facilities are open	X	X			Number of additional operating hours
Rosemont–La Petite-Patrie	Favour vertical landscaping, small walls or green walls	To come: greened landscaping planned for the sentier Préfontaine project			X		Number of landscaping projects
Sainte-Anne-de-Bellevue	Preserve plants and greenery on the bike path by expanding the planting of fruit trees along the path		X				Number of fruit trees planted
Sainte-Anne-de-Bellevue	The pool's opening hours are extended and the season is extended			X			Number of additional operating hours

Adaptation measures for heat waves: Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Install cooling islands on fire hydrants during heat waves	Multiply cooling-off options for citizens during oppressive heat	X				Number of cooling islands
Saint-Laurent	Extend pool and splash pad opening hours	Allow citizens to cool off beyond regular hours in case of oppressive heat	X				Number of additional operating hours
Saint-Laurent	Fund the project Un fil vert pour tisser Chameran (a green thread to weave Chameran together)	Green and control heat islands		X			Number of gardens and plantings made
Saint-Laurent	Fund the Cultivons notre quartier (let's cultivate our neighbourhood) project IUR Hodge-Place Benoit	Control heat islands	X				21 community garden plots, 54 greened balconies, 30 trees planted
Saint-Laurent	Plant, conserve and protect trees – Greening	Produce a report on trees planted on private land			X	X	Tree report
Saint-Laurent	Plant, conserve and protect trees – Greening	Adopt Bylaw RCA08-08-0001-78 which requires increased planting				X	Number of trees planted
Saint-Laurent	Create green alleys – Greening	In 2015-2016, renovate rue De Londres and rue Stanislas in the Norvick area to reduce mineralized surfaces			X		Number of green alleys
Saint-Laurent	Create shaded areas	Apply the zoning bylaw requiring 40% shading for parking lots and monitor it on the ground			X		Number of shaded areas built
Saint-Laurent	Create shaded areas	Adopt RCA 08-08-0001-78			X	X	Adoption of the bylaw
Saint-Léonard	Create a green alley – Greening	Landscape the public alley located between Jean-Talon, de Pontoise, le Maître and L'Assomption			X		Number of green alleys
Saint-Léonard	Plant, conserve and protect trees – Greening	– Arboretum at parc La Dauversière – Parc Wilfrid-Bastien (behind the Éco-quartier) – Parc Giuseppe-Garibaldi – Plantings as part of the canopy action plan – Plantings as part of other projects		X		X	Number of trees planted

Adaptation measures for heat waves:
Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Léonard	Create shaded areas	– Large stage at parc Wilfrid-Bastien (project) – Bocce courts (shelter at parc Ferland and picnic area adjacent to the bocce court at parc Delorme) – Already done – Dance floor at parc Delorme – Loan tents for special events (done) – Umbrellas near splash pads (certain places) – Umbrellas near outdoor pools	X			X	Number of shaded areas built
Saint-Léonard	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	– Library, splash pads, pool: extend hours during heat waves (done) – Add outdoor water fountain at parc Wilfrid-Bastien (done) and plan to for parc Delorme (to come) – Air-conditioning projects for the 2015 park pavilions (Giuseppe-Garibaldi, LaDauversière, Wilfrid-Bastien)	X			X	Number of air-conditioned public spaces
Senneville	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)					X	Number of public spaces adapted
Verdun	Plant, conserve and protect trees – Greening	Increase the number of trees planted by 10% per year		X			Tree report
Verdun	Create green alleys – Greening	Reduce heat islands and improve the living environment for and with citizens: two green alleys created in 2015 and Phase II in 2016	X				Number of green alleys
Verdun	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Install of splash pads: first phase of renovation to parc La Fontaine completed in 2015	X	X			Number of public facilities that provide access to water

Adaptation measures for heat waves:
Provide spaces for people to cool off and avoid exposure to oppressive heat (cooling islands)

BRIEF 3.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Verdun	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	Create an air-conditioned rest spot at centre Marcel-Giroux and extend pool and wading pool hours	X	X			Number of air-conditioned public spaces
Ville-Marie	Increase arena accessibility in case of heat wave	Open 12 months	X				
Ville-Marie	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Bring three wading pools up to standard with three family chalets and water jets: two are done and the third is in progress Modernize the Ville-Marie water jets Add two indoor pools	X		X		Number of new public facilities that provide access to water Call for bids
Ville-Marie	Negotiate within specific projects (ex.: green roofs, retention basins and other measures)	Evaluate and negotiate measures under the bylaw on specific projects, CA24-011		X			Number of green roofs
Villeray–Saint-Michel–Parc-Extension	Plant, conserve and protect trees – Greening	Plant 600 trees per year		X			Tree report
Villeray–Saint-Michel–Parc-Extension	Create green alleys – Greening	Create six green alleys per year		X			Number of green alleys
Villeray–Saint-Michel–Parc-Extension	Create shaded areas	Create 30 areas per year			X		Number of shaded areas built
Villeray–Saint-Michel–Parc-Extension	Increase the number of public facilities that provide access to water (wading pools, splash pads, pools, beaches, etc.) and provide service coverage	Update the aquatic plan			X		Number of new public facilities that provide access to water
Villeray–Saint-Michel–Parc-Extension	Increase the number of air-conditioned public spaces and plan to extend service during heat waves (libraries, community centres, etc.)	Apply the emergency measures plan			X		Number of air-conditioned public spaces
Westmount	Plant, conserve and protect trees – Greening		X				Tree report

BRIEF 3.3

Adaptation measures for heat waves

PROTECT BIODIVERSITY AGAINST HEAT WAVES

Benefits

- Limitation of heat waves' impacts on urban vegetation

Potential co-benefits

- Preservation of the existing arboreal heritage
- Maintenance of ecological services provided by urban vegetation
- Savings on landscaping maintenance and the purchase of replacement plants
- Improvement of citizens' living environment

Constraints and maladaptation risks

- Difficulty finding adapted plant species
- Lack of labour for plant maintenance and irrigation
- Prioritize monitoring activities and interventions in areas more likely to be affected by pest insects, such as intra-urban heat islands

Why?

By affecting vegetation, aquatic environments and fauna, heat waves can weaken biodiversity. Plants and trees located within intra-urban heat islands are much more heavily vulnerable to insects and diseases.

What we can do

Preventive measures

- Take an inventory of urban trees and keep it up to date
- Map vulnerable areas (ex.: trees within intra-urban heat islands)
- When planning planting, select species that are adapted to high-temperature conditions
- Maintain the health of plants already in place by providing them with good growing conditions
- Favour the health of plants' root systems (ex.: avoid root injuries during work on infrastructures)

Active measures

- Irrigate plants adequately during heat waves
- Evaluate the condition of plants and pay special attention to maintenance for plants located within intra-urban heat islands
- Choose alternative methods to pesticides for controlling undesirable species (ex.: physical or mechanical methods, use of natural enemies)

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Direction générale – Division du développement durable (headquarters – sustainable development division)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 31**: Establish a framework for collaboration to protect and develop areas of land that are rich in biodiversity	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Protect and develop land that is of ecological interest **Objectives**: In the medium term, increase the portion of protected land to 10% of the territory, and more in the long term Specific provisions about trees, particularly in regard to tree and root protection during construction work, are also included in the companion document. They set minimum limits that the boroughs and municipalities must respect in their urban planning regulations	X	
Service des grands parcs, du verdissement et du mont Royal (large parks, greening and Mont Royal department)	Politique de protection et de mise en valeur des milieux naturels (2004) (policy on the protection and development of natural environments (2004) – in French only)	One of the objectives aims to increase the protected surface area and ensure the longevity of natural environments A number of projects include the consolidation and expansion of ecoterritories, providing cooling-off spaces to citizens	X	

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Choose plants that are adapted to high-temperature conditions	Evaluate species Produce a list of adapted species		X			List of plants chosen
Anjou	Choose plants that are adapted to high-temperature conditions	The borough already prioritizes using plants that maximally adapt to their environment		X			Plant report
Baie-D'Urfé	Choose plants that are adapted to high-temperature conditions			X			Tree species planted
Baie-D'Urfé	Disseminate information to citizens about the selection of plants that are adapted to high-temperature conditions	Memos to citizens, Earth Day, etc.				X	Types of dissemination
Beaconsfield	In collaboration with the Montréal agglomeration, acquire land in the Angell woods					X	
Côte-des-Neiges–Notre-Dame-de-Grâce	Choose plants that are adapted to high-temperature conditions	Purchase plants based on plant hardiness zones Increase the ratio of perennials		X		X	List of plants chosen
Côte-Saint-Luc	Choose plants that are adapted to high-temperature conditions	Ecological niches based on environment (soil, land conditions, etc.)				X	List of plants chosen
Dollard-Des Ormeaux	Choose plants that are adapted to high-temperature conditions					X	List of plants chosen
Dollard-Des Ormeaux	Protect the ecoterritory and the natural environments on the city's territory, particularly the parc-nature du Bois-de-Liesse and the Centenaire William Cosgrove and Frederick-Wilson parks					X	Adoption and/or change to a bylaw
Kirkland	Plant plants that are adapted to high-temperature conditions	Include 25% of plants adapted to high temperatures in landscaping works by 2020				X	Planting/purchase report
LaSalle	Choose plants that are adapted to high-temperature conditions			X			List of plants chosen

Adaptation measures for heat waves: Protect biodiversity against heat waves

BRIEF 3.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Plateau-Mont-Royal	Choose plants that are adapted to high-temperature conditions	Draw up a list				X	List of plants chosen
Le Sud-Ouest	Choose plants that are adapted to high-temperature conditions	Purchase plants according to plant hardiness zones		X		X	List
L'Île-Bizard–Sainte-Geneviève	Choose plants that are adapted to high-temperature conditions			X			Mortality and survival rates
Mercier–Hochelaga-Maisonneuve	Choose plants that are adapted to high-temperature conditions	Choose plants based on extreme temperature variations		X			List of plants chosen
Montréal-Est	Choose plants that are adapted to high-temperature conditions	Produce a guide and internal policies				X	List of plants chosen
Montréal-Nord	Choose plants that are adapted to high-temperature conditions	Diversify choice of trees and plants		X			List of plants chosen
Mont-Royal	Choose plants that are adapted to high-temperature conditions			X			List of plants chosen
Mont-Royal	Three-year tree maintenance plan			X			Number of actions taken
Pointe-Claire	Choose plants that are adapted to high-temperature conditions	Plant plants from hardiness zones 5A and 5B in order to adapt to climate change		X			Number of plants according to their hardiness
Rivière-des-Prairies–Pointe-aux-Trembles	Choose plants that are adapted to high-temperature conditions	Apply systematically in our projects				X	List of plants chosen
Rivière-des-Prairies–Pointe-aux-Trembles	Choose a variety of tree species for planting	This measure is already continuously in place in our operations. Biodiversity is an objective already in place		X			Tree report
Rosemont–La Petite-Patrie	Choose a variety of tree species for planting	Favour biological diversity for the canopy on streets and in parks		X			Tree report
Sainte-Anne-de-Bellevue	Preserve plants and greenery on the bike path by expanding the planting of fruit trees along the path		X				Number of fruit trees planted

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Sainte-Anne-de-Bellevue	Choose plants that are adapted to high-temperature conditions			X			List of plants chosen
Saint-Léonard	Choose plants that are adapted to high-temperature conditions	Evaluate species Produce a list of adapted species				X	Creation of a list
Villeray–Saint-Michel–Parc-Extension	Choose plants that are adapted to high-temperature conditions	Evaluate species		X			List of plants chosen
Westmount	Choose plants that are adapted to high-temperature conditions			X			List of plants chosen
Westmount	Collaborate with other municipal governments to implement measures to maintain and favour urban biodiveristy on the Island of Montréal	Westmount is a member of the Table de concertation du Mont-Royal and protects the park in the Summit woods		X			Number of meetings

BRIEF 3.4

Adaptation measures for heat waves

DEVELOP EMERGENCY MEASURES FOR HEAT WAVES

Benefits

- Limits the impacts of heat waves on citizens' health within the agglomeration, particularly for vulnerable people

Potential co-benefits

- Better coordination of interventions and communications with the Centre de sécurité civile

Constraints and maladaptation risks

- Lack of staff to extend cooling and communication services

Why?

Heat waves have major sanitary consequences. High heat can be dangerous for the health of vulnerable people (seniors, people with chronic illnesses or living alone, young children, etc.).

What we can do

Strengthen our intervention capacity by collaborating closely with the Centre de sécurité civile, which has a multidisciplinary team, to implement emergency measures (also applies to other extreme weather events).

In particular:

- Make sure the tools are up to date:
  - the borough's Emergency, Relief and Missions Plan
  - the Montréal agglomeration's special response plan (SRP) for extreme heat, developed in collaboration with the Agence de santé et des services sociaux de Montréal (Montréal's health and social services agency)
- Locally, keep employees' training up to date for this type of risk
- Plan cooling and communication services: air-conditioned spots, extended opening hours for pools and splash pads, 311 telephone line service for calls from citizens, etc.

Adaptation measures for heat waves: Develop emergency measures for heat waves

BRIEF 3.4

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de sécurité incendie de Montréal – Centre de sécurité civile (fire safety service – civil protection centre)	Special response plan – Extreme heat (updated annually)	Measures for episodes of extreme heat, including the construction of air-conditioned rest stops, targeted door-to-door actions for vulnerable people, etc. Mapping tools were also developed to target neighbourhoods for priority intervention when deploying emergency measures plans	X	
Service de la diversité sociale et des sports (social diversity and sport department)	Plan d'action municipal pour les aînés 2013-2015 (municipal action plan for seniors 2013-2015 – in French only)	With this plan, Montréal aims to: • propose a more user-friendly model for signing up for the emergency evacuation assistance program • develop communication mechanisms that make it possible to do preventive work with seniors who are harder to reach	X	

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Plan to extend the opening hours of air-conditioned public spaces during heat waves (libraries, community centres, etc.)	Provide access to air-conditioned sites		X	X		Number of days for which hours have been changed
Ahuntsic-Cartierville	Adapt outdoor activity programming based on a longer summer and heat wave periods (wading pools, splash pads and pools)	Apply every day of a heat wave, post and indicate on our website		X	X		Number of days for which hours have been changed
Ahuntsic-Cartierville	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Meet with the civil protection centre		X	X		Number of participants at meetings
Anjou	Collaborate closely with the civil protection centre to implement emergency measures during heat waves	The borough subscribes to the recommendations in its emergency measures guide	X				Annual plan update
Baie-D'Urfé	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Emergency measures plan		X			Number of meetings
Baie-D'Urfé	Provide an air-conditioned shelter centre in case of emergency measures for heat waves	Emergency measures plan		X			Number of air-conditioned shelters
Baie-D'Urfé	Extend municipal pool opening hours in case of heat wave	Emergency measures plan		X			Number of days for which hours have been changed
Beaconsfield	Special response plan (SRP) for oppressive heat in effect			X			Application of the plan
Côte-des-Neiges–Notre-Dame-de-Grâce	Apply the special emergency measures plan (SEMP) – oppressive heat	Update and discuss with the staff concerned during annual planning	X				Application of the plan
Côte-Saint-Luc	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Redirect the population and employees to the library (5851 boulevard Cavendish)		X			Number of meetings

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dollard-Des Ormeaux	Maintain close collaboration with the civil protection centre to implement emergency measures (also applies to other extreme weather events)	The city has been collaborating for a long time now with the civil protection centre to implement emergency measures and establish various special plans		X			Number of meetings
Dorval	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)			X			Number of meetings
Kirkland	Collaborate closely with the civil protection centre to implement emergency measures	Meet with the civil protection centre annually to check emergency procedures		X			Frequency of communications
Kirkland	Put into place the local CODE RED emergency phone system	Reach 80% sign-up for the local CODE RED emergency phone system by 2020		X			Number of citizens signed up to the telephone list
Lachine	Training is provided each year to all monitoring and monitoring-lifeguarding staff	Trainings (heatstroke)		X			Number of staff members trained
Lachine	A corporate plan is already in the works for cooled rest stops	We are opening the Maison du brasseur in the borough of Lachine for the LaSalle-Lachine-Dorval area	X				Ville de Montréal emergency measures plan
Lachine	Extend opening hours for water basins and turn on the splash pads at parc Kirkland late at night		X				Number of days for which hours have been changed
LaSalle	Emergency measures plan in effect	Identify air-conditioned spaces	X				Number of air-conditioned spaces
LaSalle	Communication plan, open the pools	Extend opening hours	X				Number of days for which hours have been changed
LaSalle	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)			X			Number of meetings

Adaptation measures for heat waves:
Develop emergency measures for heat waves

BRIEF 3.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Plateau-Mont-Royal	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Take training provided by the Service de sécurité incendie de Montréal (SIM) (fire safety service)		X			Number of meetings
Le Sud-Ouest	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Attend meetings and maintain the relationship with civil protection		X			Number of participants at meetings
Le Sud-Ouest	Extend hours for outdoor water bodies by one hour	Apply each day of a heat wave Post and indicate on Facebook		X			Number of heat wave days
Le Sud-Ouest	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Meet with the civil protection centre		X			Number of participants at meetings
L'Île-Bizard–Sainte-Geneviève	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)			X			Number of meetings
Mercier–Hochelaga-Maisonneuve	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	The borough's emergency measures plan, including the extreme heat action plan, is updated annually, jointly with the civil protection centre		X			Number of meetings
Mercier–Hochelaga-Maisonneuve	Emergency measures plan and extreme heat plan	The borough is working jointly with the civil protection centre to update these two plans annually		X			Updating of plans
Montréal-Est	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Plan in effect		X			Number of meetings
Montréal-Nord	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)			X			Number of meetings
Montréal-Ouest	Extend hours for outdoor water bodies by one hour	Post on Facebook each heat wave day		X			Number of heat wave days

Adaptation measures for heat waves:
Develop emergency measures for heat waves

BRIEF 3.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Ouest	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Meet with the civil protection centre		X			Number of participants at meetings
Mont-Royal	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Meet with the civil protection centre		X			Number of meetings
Mont-Royal	Civil safety plan – cooling-off spaces at city hall and recreation centres			X			Number of cooling-off spaces
Outremont	Collaborate closely with the civil protection centre to implement emergency measures	– Update the Emergency, Relief and Missions Plan (ERMP) annually – Periodically update emergency measures – Include corrections issued by the civil protection centre following the annual evaluation of the ERMP – Conduct telephone exercices and hold periodic meetings – Attend meetings on the subject of oppressive heat – Keep an updated list of the borough's air-conditioned rest stops	X				Number of actions taken
Pierrefonds-Roxboro	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Attend meetings with the civil protection centre and maintain ties with them		X			Number of participants at meetings
Pointe-Claire	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Ensure that emergency measures are implemented quickly in case of emergency related to extreme weather events		X			Number of collaborations when implementing emergency measures
Pointe-Claire	Provide air-conditioned public spaces and plan to extend service during heat waves (library and aquatic centre) and in case of oppressive heat	The Central Library and aquatic centre remain open when the temperature is at or above 33 °C for more than three days and/or temperatures are above 25 °C for two consecutive nights	X				Number of days for which hours have been changed

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pointe-Claire	Training on heatstroke – lifeguards	Include the annual lifeguard training during team training		X			Number of lifeguards trained per year
Pointe-Claire	Put into place the local CODE RED emergency phone system	Be able to reach all citizens by the telephone system in case of emergency Keep people informed	X				Percentage of residents whose names are in the software
Rivière-des-Prairies–Pointe-aux-Trembles	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	The borough's emergency measures plan is updated yearly with civil protection. Keep the list of air-conditioned public spaces up to date		X			Send the Emergency, Relief and Missions Plan (ERMP) and the updated list of air-conditioned public spaces to the civil protection centre
Rivière-des-Prairies–Pointe-aux-Trembles	Maintain the collaborative relationship with the civil protection centre for the special response plan (SRP) for extreme heat with a view to providing the necessary information to the population	List of air-conditioned public spaces is updated annually by the Direction de la culture, des sports, des loisirs et du développement social (culture, sport, recreation and social development department) and memos are sent to citizens when necessary		X			Number of meetings
Rosemont–La Petite-Patrie	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	The borough's emergency measures plan is updated annually		X			Number of meetings
Sainte-Anne-de-Bellevue	Update the city's emergency measures			X			Updated emergency measures
Saint-Laurent	Extend opening hours for certain publicly accessible municipal buildings	Allow citizens access to air-conditioned spaces during the day		X			Number of days for which hours have been changed
Saint-Laurent	Put into place a special response plan in case of oppressive heat	Protect the health of the most vulnerable citizens/reduce pressure on medical establishments	X				Application of the plan
Saint-Laurent	Produce a citizen emergency guide	Produced in 2009	X				Guide

Adaptation measures for heat waves: Develop emergency measures for heat waves

BRIEF 3.4

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Put communication tools into place to disseminate emergency measures in real time	School networks, online newsletter, 311 network		X			Updated communication tools
Saint-Léonard	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events) – annual update to the Emergency, Relief and Missions Plan (ERMP)	– Ensure that the names of those in charge are up to date – Make sure the most recent versions are distributed to the appropriate people – Annual update to the ERMP			X		Updated list Distribution of the list to inter-borough partners
Saint-Léonard	Develop a drinking water distribution plan in case of extreme heat	– Produce a map of distribution areas – Produce a communication plan				X	Adoption of the plan
Saint-Léonard	Apply regulations more rigorously (bylaw on nuisances) to control the effects of dust in the industrial area and in areas under construction during heat waves	The inspectors in the Qualité du milieu (environmental quality) section will conduct checks and, as needed, advise inspectors from the Service des infrastructures, de la voirie et des transports (infrastructure, roads and transportation department) in order to make sure Montréal's regulations in this area are respected In projects carried out for the borough, include dust mitigation by the contractor in the specifications			X		Number of notices issued Percentage of projects targeted with the dust mitigation clause
Senneville	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)					X	
Verdun	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Air-conditioned rest stop at centre Marcel-Giroux and extended pool and wading pool hours			X		Number of meetings with the civil protection centre
Ville-Marie	The emergency measures plan includes agreements with institutions to create air-conditioned rest areas		X				

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ville-Marie	The emergency measures plan is regularly updated		X				
Ville-Marie	See about using urban furniture for posting – future Imap bus shelter (Ville display)	When deploying postings for the public, plan notices indicating places to take shelter			X		Implementation as part of the cultural display deployment (Imap)
Villeray–Saint-Michel–Parc-Extension	Collaborate closely with the civil protection centre to implement emergency measures (applies to other extreme weather events)	Continue with collaborations and update the emergency measures		X			Number of meetings
Westmount	CODE RED community alert program		X				
Westmount	Vieillissement en Sécurité (aging in safety) program for autonomous seniors		X				

BRIEF 4.1

Adaptation measures for heavy storms

INCREASE INFRASTRUCTURES' AND BUILDINGS' RESILIENCE TO WIND AND FREEZING RAIN

Benefits

- Prevention of some damages and reduction of the scope of damage
- Increased citizen safety and wellbeing

Potential co-benefits

- Buried wires improve neighbourhood aesthetics and eliminate space usage conflicts with trees
- Considering climate change for the built environment makes it possible to reach other goals, such as improving quality of life and public health and protecting ecosystems

Constraints and maladaptation risks

- Standards and codes are not necessarily adapted yet to the new realities of climate change

Why?

High winds, hail, freezing rain and heavy snow can disrupt activities on the Montréal agglomeration's territory (power outages, reduced road mobility, telecommunication service interruption, etc.) and endanger the population's health and safety (accidents, injuries due to falling trees or debris, etc.).

What we can do

In an urbanized setting, population density and interdependencies between infrastructures are complex and can be easily disrupted. The adaptation strategies to adopt must protect citizens, ensure that a range of services are provided, facilitate emergency operations, and protect infrastructures. It is also important to consider climate change starting at the design and planning phase for operations and public infrastructure maintenance in order to minimize the risks associated with storms.

- Include measures to boost municipal buildings' resilience in their maintenance programs
- Plan to bury wires for new construction projects
- Carry out preventative maintenance on trees, particularly pruning
- Select plant species that are less susceptible to breakage

Adaptation measures for heavy storms: Increase infrastructures' and buildings' resilience to wind and freezing rain

BRIEF 4.1

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de l'eau (water department)	Stratégie montréalaise de l'eau 2011-2020 (Montréal water strategy 2011-2020 – in French only)	Install emergency generators in all drinking water production plants and all pumping stations	X	X

Adaptation measures for heavy storms: Increase infrastructures' and buildings' resilience to wind and freezing rain

BRIEF 4.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Bury wires in all new construction projects	Bylaw on cabled networks by the Commission des services électriques de Montréal (CSEM) Require that wires be buried for all new projects		X			Number of metres of wire buried per year
Anjou	Plan to bury wires in all new construction projects	Ideally, all wires on our territory should be buried. However, attaining this objective will depend on cost				X	Number of projects Number of metres of wire buried per year
Côte-des-Neiges–Notre-Dame-de-Grâce	Plan to bury wires in all new construction projects	Bylaw on cabled networks by the Commission des services électriques de Montréal (CSEM) Require that wires be buried for all new projects		X			Number of metres of wire buried per year
Côte-des-Neiges–Notre-Dame-de-Grâce	Include measures in the municipal property maintenance program aiming to boost their resilience. Refer, among others, to the document *Changements climatiques, vulnérabilité et adaptation des immeubles* by the Corporation d'hébergement du Québec, April 2011(in French only)	Include in forthcoming projects		X			Number of measures included in the program
Côte-Saint-Luc	Plan to bury wires in all new construction projects	Effective: Municipal Bylaw 1249 (1972)		X			Number of metres of wire buried per year
Dollard-Des Ormeaux	Include measures in the municipal property maintenance program aiming to boost their resilience. Refer, among others, to the document *Changements climatiques, vulnérabilité et adaptation des immeubles* by the Corporation d'hébergement du Québec, April 2011 (In French only)					X	Number of measures included in the program
Dollard-Des Ormeaux	Plan to bury wires in all new construction projects	Buried wiring is required for row housing and small homes in Chapter 8 of the zoning bylaw	X				Number of metres of wire buried per year

Adaptation measures for heavy storms: Increase infrastructures' and buildings' resilience to wind and freezing rain

BRIEF 4.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Kirkland	Bury wires in all new construction projects	Continue to bury electrical wires, when possible, in our construction projects		X			Number of metres of wire buried per year
Lachine	Bury electrical wires for all new constructions	Bylaw from the Commission des services électriques de Montréal (CSEM)	X				Number of metres of wire buried per year
LaSalle	Bury wires in new projects			X			Number of metres of wire buried per year
LaSalle	Plan to bury wires in all new construction projects	Mandatory for all new projects				X	Number of metres of wire buried per year
LaSalle	Include measures in the municipal property maintenance program aiming to boost their resilience. Refer, among others, to the document *Changements climatiques, vulnérabilité et adaptation des immeubles* by the Corporation d'hébergement du Québec, April 2011 (in French only)				X		Number of measures included in the program
Le Sud-Ouest	Plan to bury wires in all new construction projects	50 metres per year				X	Linear number of conduits
Le Sud-Ouest	Plan to bury wires in all new construction projects	Bury wires for rue de la Montagne and at parc Square-Gallery		X			Number of metres of wire buried per year
L'Île-Bizard–Sainte-Geneviève	Plan to bury wires in all new construction projects	Done since 2009		X			Number of metres of wire buried per year
Mercier–Hochelaga-Maisonneuve	Plan to bury wires in all new construction projects	Mandatory: Bylaw 12-012 of the Commission des services électriques de Montréal (CSEM)		X			Number of metres of wire buried per year
Montréal-Est	Include measures in the municipal property maintenance program aiming to boost their resilience. Refer, among others, to the document *Changements climatiques, vulnérabilité et adaptation des immeubles* by the Corporation d'hébergement du Québec, April 2011 (in French only)	For new municipal projects				X	Number of measures included in the program

Adaptation measures for heavy storms: Increase infrastructures' and buildings' resilience to wind and freezing rain

BRIEF 4.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Nord	Plan to bury wires in all new construction projects					X	Number of metres of wire buried per year
Montréal-Ouest	Plan to bury wires in all new construction projects					X	Number of metres of wire buried per year
Mont-Royal	Plan to bury wires in all new construction projects			X			Number of metres of wire buried per year
Mont-Royal	Contract for tree maintenance around buildings			X			Number of trees maintained per year
Outremont	Plan to bury wires in all new construction projects	Apply Bylaw 06.069				X	Number of metres of wire buried per year
Pierrefonds-Roxboro	Bury wires in all new construction projects	Apply the bylaw from the Commission des services électriques de Montréal (CSEM)		X			Length of buried conduits
Pointe-Claire	Favour burying wires in all new construction projects	All new constructions must have buried wires	X				Number of metres of wire buried per year per new project
Rivière-des-Prairies–Pointe-aux-Trembles	Plan to bury wires in all new construction projects	Systematically apply regulations to this effect		X			Number of linear metres of buried wires
Rosemont–La Petite-Patrie	Plan to bury wires in all new construction projects	Done: building project on the former site of the Ville de Montréal workshops; burying of wires in the extensions of avenue de Chateaubriand, rue des Ateliers and rue Saint-Vallier Forthcoming: wire burying project under evaluation for the extension of rue Mont-Royal	X		X		Number of projects Number of metres of wire buried per year
Saint-Laurent	Favour burying wires in all new construction projects	Continue to bury wires for all new development projects		X			Number of buried kilometres in a row

Adaptation measures for heavy storms: Increase infrastructures' and buildings' resilience to wind and freezing rain

BRIEF 4.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Léonard	Include measures in the municipal property maintenance program aiming to boost their resilience. Refer, among others, to the document *Changements climatiques, vulnérabilité et adaptation des immeubles* by the Corporation d'hébergement du Québec, April 2011 (in French only)	Analyze measures to apply				X	Number of measures included in the program
Senneville	Plan to bury wires in all new construction projects					X	
Verdun	Plan to bury wires in all new construction projects	Underway at île des Soeurs		X			Number of kilometres of streets with buried wires

BRIEF 4.2

Adaptation measures for heavy storms

DEVELOP EMERGENCY MEASURES IN CASE OF PROLONGED POWER OUTAGE (WINTER CONDITIONS)

Benefits

- Ensures at least minimal operation of essential services
- Limits the impacts of power outages on citizens
- Plans site and space set-ups in case of emergency

Potential co-benefits

- Better coordination of interventions and communications with the Centre de sécurité civile

Constraints and maladaptation risks

- Lack of staff
- Temporary relocation of citizens

Why?

In winter, long power outages caused by storms (freezing rain, snow, blizzards) can cause serious inconveniences for citizens' health and safety, and can interrupt a number of important public services. Emergency measures aim to organize operations for prevention, preparation, intervention and recovery of activities, in so doing allowing the municipal administration to handle the hazards that may affect their territory.

What we can do

Strengthen our intervention capacity by collaborating closely with the Centre de sécurité civile, which has a multidisciplinary team, to implement emergency measures (also applies to other extreme weather events).

In particular:

- Make sure the tools are up to date:
  - the borough's Emergency, Relief and Missions Plan
  - the Montréal agglomeration's special response plan (SRP) for exceptional storms
- Locally, keep employees' training up to date for this type of intervention
- Increase the accessibility of public spaces equipped with generators and plan to extend opening hours for some service locations (libraries, community centres, etc.)

Adaptation measures for heavy storms: Develop emergency measures in case of prolonged power outage (winter conditions)

BRIEF 4.2

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de sécurité incendie de Montréal – Centre de sécurité civile (fire safety service – civil protection centre)	Special response plan (SRP) for exceptional storms: - snow section - intense cold section (being prepared)	Coordinate snow removal activities with the boroughs and cities depending on the quantity of expected and accumulated precipitation and the effect of aggravating factors	x	

Adaptation measures for heavy storms: Develop emergency measures in case of prolonged power outage (winter conditions)

BRIEF 4.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Plan public spaces equipped with generators and make them accessible to citizens during power outages	Develop agreements with our partners		X			Number of new public spaces equipped with generators
Ahuntsic-Cartierville	Develop an action guide for windstorms in order to facilitate emergency operations on public land	Guide planned for 2015 (in creation)			X		Action guide
Anjou	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	The borough already makes its municipal buildings available and plans extended or ongoing hours depending on needs and the situation		X			Number of new public spaces equipped with generators
Baie-D'Urfé	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages			X			Emergency measures management plan
Beaconsfield	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Install two generators that can serve the city's needs in case of power outage. They serve city hall, the recreation centre (emergency shelter) and public works		X			Number of new public spaces equipped with generators
Côte-Saint-Luc	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Three in place (library, city hall, fire station, public works) One to come in 2015 (Aquatic and Community Centre)	X		X		Number of new public spaces equipped with generators
Dollard-Des Ormeaux	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)						Number of new public spaces equipped with generators
Dollard-Des Ormeaux	The emergency measures plan sets out our approach to this sort of situation			X			Plan

Adaptation measures for heavy storms: Develop emergency measures in case of prolonged power outage (winter conditions)

BRIEF 4.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Kirkland	Maintain the accessibility of public spaces equipped with generators and plan to extend service during power outages	Maintain the accessibility of current spaces and improve as needed		X			Number of new public spaces equipped with generators
Kirkland	Put into place the local CODE RED emergency phone system	Reach 80% sign-up for the local CODE RED emergency telephone system by 2020			X		Number of citizens signed up for the telephone list
Lachine	Update the emergency measures plan	Buildings set up with generators: warehouse, old brewery, Maison du Brasseur, chalet at parc LaSalle	X				Plan
LaSalle	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Borough mayoral office: total generator Public works: minimum generator Aquadôme: generator to preserve the building	X				Number of new public spaces equipped with generators
LaSalle	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)		X				Number of new public spaces equipped with generators
Le Sud-Ouest	Maintain the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Carry out a needs analysis		X		X	Number of public spaces equipped with generators
Le Sud-Ouest	Add movable stop signs in strategic places	Add movable stop signs to strategic places based on the borough's emergency measures program		X			Number of times that movable stop signs must be used
Le Sud-Ouest	Equip traffic lights to operate for 36 additional hours without electricity	Equip traffic lights to operate for 36 additional hours without electricity based on the borough's emergency measures program		X			Number of times the traffic lights must operate for 12 additional hours without electricity

Adaptation measures for heavy storms: Develop emergency measures in case of prolonged power outage (winter conditions)

BRIEF 4.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
L'Île-Bizard-Sainte-Geneviève	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)			X			Number of new public spaces equipped with generators
Mercier–Hochelaga-Maisonneuve	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	The borough's emergency plan sets out six shelters, including two with full-time generators and four with generators that can be quickly installed		X			Number of new public spaces equipped with generators
Mercier–Hochelaga-Maisonneuve	Emergency measures plan	The borough is working jointly with the civil protection centre to update the plan annually		X			Plan
Montréal-Nord	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)					X	Number of new public spaces equipped with generators
Mont-Royal	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)					X	Number of new public spaces equipped with generators
Mont-Royal	Civil safety plan – shelter and heating			X			Plan
Mont-Royal	Install generators for municipal buildings		X				Number of new public spaces equipped with generators
Outremont	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Two spaces are equipped with generators: the library (portable generators) and the Centre culturel intergénérationnel (permanent generator)	X				Number of new public spaces equipped with generators
Pierrefonds-Roxboro	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Equip other buildings with generators			X		Number of new public spaces equipped with generators

Adaptation measures for heavy storms: Develop emergency measures in case of prolonged power outage (winter conditions)

BRIEF 4.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pointe-Claire	Access to public spaces equipped with generators in case of prolonged power outage in winter (aquatic centre and local school)	Arena and aquatic centre, public security (firefighters and police), municipal court, library, city hall and public works are all equipped with generators in order to carry on providing municipal services		X			Number of times public spaces have been accessible in case of prolonged power outage
Rivière-des-Prairies–Pointe-aux-Trembles	Increase accessibility to public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Include the required work in the three-year building plan (PTI)				X	Number of new public spaces equipped with generators
Rivière-des-Prairies–Pointe-aux-Trembles	Optimize the use (hookup) of existing generators in emergency shelters and multi-service assistance centres	Include the required work in the three-year building plan (PTI)				X	Percentage of the generator's capacity used
Rivière-des-Prairies–Pointe-aux-Trembles	Maintain a collaborative relationship with the civil protection centre for the special response plan (SRP) for power outages in order to communicate necessary information to the population	Determine the places that can shelter citizens (Direction de la culture, des sports, des loisirs et du développement social (culture, sport, recreation and social development department) – mission to assist disaster victims) and disseminate the information when necessary		X			Number of meetings
Sainte-Anne-de-Bellevue	Update the city's emergency measures	Annual action plan in 2015			X		Plan
Saint-Laurent	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Emergency shelter at the recreation centre	X				Number of new public spaces equipped with generators
Saint-Laurent	Produce a citizen guide to emergency situations	Produced in 2009	X				Guide
Saint-Laurent	Put communication tools into place to disseminate emergency measures information in real time	Social network, online newsletter, 311 network	X				Number of citizens reached

Adaptation measures for heavy storms: Develop emergency measures in case of prolonged power outage (winter conditions)

BRIEF 4.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Laurent	Put special response plans into place for destructive storms (exceptional snow and heavy rainfalls)		X				Number of special response plans
Saint-Léonard	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	In place at the mayoral office Drafted for the library	X			X	Number of new public spaces equipped with generators
Senneville	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)					X	Number of new public spaces equipped with generators
Verdun	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Opening of a shelter at centre Marcel-Giroux		X	X		Number of new public spaces equipped with generators
Ville-Marie	Equip the borough with emergency generators					X	Number of new public spaces equipped with generators
Ville-Marie	Ensure the accessibility of goods and local services (retail continuity in downtown Montréal)	Maintain the obligation of retail continuity for a set of downtown arteries		X			Application of the regulations
Villeray–Saint-Michel–Parc-Extension	Increase the accessibility of public spaces equipped with generators and plan to extend service during power outages (libraries, community centres, etc.)	Apply the Emergency, Relief and Missions Plan (ERMP)		X			Number of new public spaces equipped with generators
Westmount	CODE RED community alert program	Completed in 2014	X				
Westmount	Vieillissement en Sécurité (aging in safety) program for autonomous seniors	Begun in 2012		X			

BRIEF 4.3

Adaptation measures for heavy storms

INCREASE PLANTS' RESILIENCE TO WIND AND FREEZING RAIN

Benefits

- Reduction of damages and costs associated with tree breakages
- Increased citizen safety and wellbeing

Potential co-benefits

- Conservation of the arboreal heritage and associated benefits

Constraints and maladaptation risks

- Lack of labour
- Difficulty acting quickly

Why?

High winds, hail and freezing rain can cause major injuries to plants and trees. In an urban setting, tree breakages that occur near streets or areas of human activity can disrupt activities (power outages, reduced road mobility, disrupted telecommunications services, etc.) and endanger the population's health and safety (accidents, injuries due to falling trees or debris, etc.). Trees that are not doing well or that are affected by certain pest insects (ex.: emerald ash borer) are especially vulnerable to being damaged during destructive storms.

What we can do

- Keep trees healthy and vigorous
- Select plant species that are less vulnerable to breakages
- Map the areas that are more vulnerable to tree breakages during destructive storms
- Plant trees where they are less likely to cause damage if they break
- Regularly inspect trees on your territory and note their state
- Carry out preventative maintenance on trees, particularly by pruning broken branches without delay
- Cut down dead trees as soon as possible
- Prioritize pruning and cutting down trees based on risks
- Encourage trees to root deeply
- Prevent root damage when conducting road and aqueduct maintenance work

Adaptation measures for heavy storms: Increase plants' resilience to wind and freezing rain

BRIEF 4.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Plan a systematic pruning program for trees	Prune every five years for street trees and every ten years for park trees				X	Implementation of the program
Ahuntsic-Cartierville	Select plant species that are less susceptible to breakage	Action already done as part of our regular activities Apply systematically in our projects and plant purchases		X			Number of resistant species purchased
Ahuntsic-Cartierville	Plan a pruning and training plan for young trees to improve their structure in the long term	Three-year pruning and training process is planned into the planting contracts carried out by private companies				X	Contract monitoring and list of works performed
Anjou	Perform preventive tree maintenance, particularly pruning	Measure currently in effect		X			Number of trees maintained
Anjou	Select plant species that are less susceptible to breakage	The borough already chooses plants that withstand their environment		X			Number of plants
Baie-D'Urfé	Perform preventive tree maintenance, particularly pruning			X			Number of trees maintained per year
Baie-D'Urfé	Select plant species that are less susceptible to breakage			X			Number of resistant species purchased
Beaconsfield	Annual pruning program for the city's trees					X	Number of trees pruned
Côte-des-Neiges–Notre-Dame-de-Grâce	Perform preventive tree maintenance, particularly pruning	When possible				X	Number of trees maintained per year
Côte-des-Neiges–Notre-Dame-de-Grâce	Select plant species that are less susceptible to breakage	According to tree availability				X	Number of resistant species purchased
Côte-Saint-Luc	Perform preventive tree maintenance, particularly pruning	Over 600 work orders underway since January 2015		X			Number of trees maintained per year
Dollard-Des Ormeaux	Continue preventive tree maintenance, particularly pruning					X	Number of trees pruned
Dollard-Des Ormeaux	The city prunes branches, clears trees away from infrastructures and streets, and handles public safety		X				Number of trees pruned

Adaptation measures for heavy storms: Increase plants' resilience to wind and freezing rain

BRIEF 4.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Dollard-Des Ormeaux	Select plant species that are less susceptible to breakage					X	Number of resistant species purchased
Dorval	Perform preventive tree maintenance, particularly pruning			X		X	Number of trees maintained per year
Dorval	Select plant species that are less susceptible to breakage			X		X	Number of resistant species purchased
Kirkland	Select plant species that are less susceptible to breakage	Purchase trees recognized as being very resistant for at least 10% of trees intended for municipal planting by 2020				X	Number of trees purchased
Kirkland	Implement a preventive maintenance program for public trees	Maintain the annual preventive pruning of public trees		X			Maintenance report
LaSalle	Perform preventive tree maintenance, particularly pruning	Five-year cyclical program				X	Number of trees maintained per year
LaSalle	Select plant species that are less susceptible to breakage			X			Number of resistant species purchased
LaSalle	Adapt our pruning methods					X	
Le Plateau-Mont-Royal	Select plant species that are less susceptible to breakage	Create a list of species less vulnerable to freezing				X	Deliverable
Le Plateau-Mont-Royal	Inspect problematic trees and conduct the necessary work to solidify branches with structural weaknesses	Inspect all the borough's trees every five years (about 3,000 per year)				X	Number of trees to inspect
Le Plateau-Mont-Royal	Perform preventive tree maintenance, particularly pruning	Prune 1,000 trees per year				X	Number of trees pruned
Le Sud-Ouest	Select plant species that are less susceptible to breakage	Put into place and apply a tree plan				X	Number of resistant species purchased
Le Sud-Ouest	Perform preventive tree maintenance, particularly pruning	Prune every five years for street trees and every ten years for park trees		X		X	Pursuit of the systemic pruning plan

Adaptation measures for heavy storms: Increase plants' resilience to wind and freezing rain

BRIEF 4.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
L'Île-Bizard–Sainte-Geneviève	Perform preventive tree maintenance, particularly pruning	Done since 2004		X			Number of trees maintained per year
L'Île-Bizard–Sainte-Geneviève	Select plant species that are less susceptible to breakage			X			Number of resistant species purchased
Mercier–Hochelaga-Maisonneuve	Perform preventive tree maintenance, particularly pruning	Conduct on 75% of the borough's territory				X	Percentage of the territory on which we conduct systematic tree maintenance
Montréal-Est	Perform preventive tree maintenance, particularly pruning			X			Number of trees maintained per year
Montréal-Est	Select plant species that are less susceptible to breakage			X			Number of resistant species purchased
Montréal-Nord	Perform preventive tree maintenance, particularly pruning	Maintenance plan already in place – prune the entire urban forest every five years		X			Number of trees maintained per year
Montréal-Nord	Select plant species that are less susceptible to breakage	Diversify choice of trees – see the list sent to Montréal		X			Number of resistant species purchased
Montréal-Ouest	Perform preventive tree maintenance, particularly pruning					X	Number of trees pruned
Mont-Royal	Perform preventive tree maintenance, particularly pruning	Perform tree maintenance every three years		X			Number of trees maintained per year
Mont-Royal	Contract for tree maintenance around buildings			X			Number of trees maintained per year
Mont-Royal	Select plant species that are less susceptible to breakage					X	Number of resistant species purchased
Outremont	Perform preventive tree maintenance, particularly pruning	Conduct the cyclical pruning program instead of ad hoc interventions, which generate more individual citizen requests		X			Number of trees maintained per year

Adaptation measures for heavy storms: Increase plants' resilience to wind and freezing rain

BRIEF 4.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Pierrefonds-Roxboro	Perform preventive tree maintenance, particularly pruning	Create and apply a tree plan			X		Number of trees maintained
Pierrefonds-Roxboro	Perform preventive tree maintenance, particularly pruning	Create and apply a tree plan			X		Number of trees maintained
Pointe-Claire	Perform preventive tree maintenance, particularly pruning	Ensure that the city's trees can resist wind and freezing rain		X			Tree inventory
Pointe-Claire	Select plant species that are less susceptible to breakage	Keep our forest inventory up to date and choose an orientation for the city in terms of species diversity				X	Urban forestry plan or policy
Rivière-des-Prairies–Pointe-aux-Trembles	Perform preventive tree maintenance, particularly pruning	Action already conducted as part of our regular activities Apply systematically in our projects and plant purchases		X			Number of trees maintained per year
Rivière-des-Prairies–Pointe-aux-Trembles	Select plant species that are less susceptible to breakage	This action is already carried out as part of our planning for the species we plant in our parks and green spaces		X			Number of resistant species purchased
Rosemont–La Petite-Patrie	Perform preventive tree maintenance, particularly pruning	The systematic maintenance program plays a certain preventive role. We maintain tree health and safety by eliminating dead, broken, weak, split and low-hanging branches, which can endanger people, vehicles and buildings		X			Tree report
Rosemont–La Petite-Patrie	Select plant species that are less susceptible to breakage	Choose appropriate plant species	X				Number of resistant species purchased
Sainte-Anne-de-Bellevue	Perform preventive tree maintenance, particularly pruning			X			Number of trees maintained per year
Saint-Laurent	Select plant species that are less susceptible to breakage	Verify each proposed landscaping plan while taking special concern for species choice Monitor plantings			X		Identification of species to choose and dissemination of this information
Saint-Léonard	Perform preventive tree maintenance, particularly pruning	Prune 1,500 to 3,000 trees per year		X		X	Number of trees maintained

Adaptation measures for heavy storms: Increase plants' resilience to wind and freezing rain

BRIEF 4.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Senneville	Perform preventive tree maintenance, particularly pruning					X	
Verdun	Perform preventive tree maintenance, particularly pruning	Put a maintenance program into place	X				Prospectus to citizens for private land
Villeray–Saint-Michel–Parc-Extension	Perform preventive tree maintenance, particularly pruning	1,500 trees per year		X			Number of trees maintained per year
Villeray–Saint-Michel–Parc-Extension	Select plant species that are less susceptible to breakage	Apply the practices set by the central city		X			Number of resistant species purchased
Westmount	Perform preventive tree maintenance, particularly pruning			X			Number of trees maintained per year
Westmount	Select plant species that are less susceptible to breakage			X			Number of resistant species purchased

BRIEF 5.1

Adaptation measures for drought

ENSURE THE QUALITY AND QUANTITY OF DRINKING WATER

Benefits

- Infrastructures in good condition and the assurance of quality water
- Minimizing of public health risks
- Encouragement of priority drinking water usage in times of heavy demand
- Adaptation to new water availability constraints

Potential co-benefits

- Savings in the production of drinking water thanks to reduced water consumption
- Development of drinking water treatment procedures that are better adapted to changes in the characteristics of raw water
- Raising awareness among the population about the importance of water

Constraints and maladaptation risks

- Higher water treatment operating costs
- Non-optimal operating conditions

Why?

Drinking water in the Montréal agglomeration is sourced from the St. Lawrence River, Lac Saint-Louis and Rivière des Prairies. In normal weather, the water flow is largely sufficient to meet the population's needs. However, in the case of particularly severe low water flow (hydrological drought), the quantity or quality of raw water (pre-treatment) may drop. A lower water level may cause changes in the physical, chemical and biological characteristics of raw water. Along with these reductions in quantity and quality, the demand for water may go up with higher temperatures. Putting measures into place to ensure the quality and quantity of drinking water requires us to make adjustments throughout the cycle: from pumping to treatment, from distribution to consumption, and all the way to its elimination.

What we can do

The Service de l'eau (water department) has identified the risks associated with drought, and many measures are already in place, such as the adaptation of water treatment based on the changing characteristics of raw water. But we can still list the major action items:

- Preserve the agglomeration's raw water resources
- Reduce the volumes of water lost along the network: renovation and ongoing maintenance program for infrastructures
- Optimize management methods: ongoing maintenance program and water savings program
- Make sure to apply the bylaw concerning the use of drinking water (RCG 13-023 for the boroughs and RCG 13-011 for the municipalities)

Adaptation measures for drought: Ensure the quality and quantity of drinking water

BRIEF 5.1

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Direction générale – Division du développement durable (headquarters – sustainable development division)	Plan de développement durable de la collectivité montréalaise 2010-2015 (sustainable development plan for the Montréal community 2010-2015 – in French only)	**Action 17**: Reduce water leaks and illicit uses **Action 19**: Improve the efficiency of drinking water use	X	
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Ensure adequate stocks of quality drinking water **Objective**: Preserve the ability to provide quality water to citizens at all times and at a low cost **Objective**: Continue to implement the Stratégie montréalaise de l'eau (Montréal water strategy)	X	
Service de l'eau (water department)	Stratégie montréalaise de l'eau 2011-2020 (Montréal water strategy 2011-2020 – in French only)	1. Conduct a vulnerability analysis of drinking water sources, develop protection/conservation plans and emergency measures (such as required by the Règlement sur le prélèvement des eaux et leur protection (RPEP) (regulation on water withdrawal and protection)) and conduct ongoing monitoring of raw water quality (alert station) 2. Auscultats and maintain primary and secondary pipes 3. Increase the annual renewal rate of aqueduct and sewer systems 4. Implement a real-time flow and pressure measurement system on the primary system and regulation project on the secondary system	X	X
Service de l'eau (water department)	Bylaw 13-023 on drinking water usage	This bylaw aims to govern drinking water usage with a view to preserving the resource's quality and quantity, particularly via measures to reduce consumption	X	

Adaptation measures for drought: Ensure the quality and quantity of drinking water

BRIEF 5.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Apply Bylaw RCG 13-023 on drinking water usage	Apply the current bylaw		X			Application of the bylaw
Anjou	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the current bylaw		X			Number of actions taken
Baie-D'Urfé	Adopt a bylaw on drinking water usage	Adopted in 2012	X				Bylaw #1300
Beaconsfield	Sheathing and rehabilitatoin program for aqueduct pipes					X	
Côte-des-Neiges–Notre-Dame-de-Grâce	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the current bylaw		X			Application of the bylaw
Côte-Saint-Luc	Apply Bylaw RCG 13-011 on drinking water usage (reconstituted cities)	Two sets of collectors are exiting: 1. chemin de la Côte-Saint-Luc toward Montréal-Ouest (Toe/Blake) 2. Kildare toward Lachine (Meadowbrook)				X	Application of the bylaw
Dollard-Des Ormeaux	Apply Bylaw RCG 13-011 on drinking water usage (reconstituted cities)	Apply the current bylaw		X			Application of the bylaw
Dollard-Des Ormeaux	Apply the water usage bylaw	Apply the current bylaw		X			Application of the bylaw
Kirkland	Apply Municipal Bylaw 2012-55 on drinking water usage	Bylaw adopted in 2012 – Maintain the application of the bylaw and change it as needed	X	X			Application of the bylaw
Lachine	Bylaw RCG 13-023	Apply the current bylaw		X			Application of the bylaw
Lachine	Upgrade facilities, filtration plant	Collaborate with the central city departments concerned to facilitate this work as much as possible. Request to install two raw water intakes during the forthcoming plant renovation to reduce our demand for drinking water for municipal maintenance purposes.		X			

Adaptation measures for drought: Ensure the quality and quantity of drinking water

BRIEF 5.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Water supply from the Charles-J.-Des Baillets plant	Planned for 2016			X		
LaSalle	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Change the cooling system for the Dollard-St-Laurent sports centre so that it's no longer water-cooled				X	Change to the cooling system
Le Sud-Ouest	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the current bylaw		X		X	Application of the bylaw
L'Île-Bizard–Sainte-Geneviève	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the current bylaw		X			Application of the bylaw
Mercier–Hochelaga-Maisonneuve	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the bylaw		X			Application of the bylaw
Montréal-Nord	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the bylaw		X			Application of the bylaw
Mont-Royal	Apply Bylaw RCG 13-011 on drinking water usage (reconstituted cities)	Apply the current bylaw		X			Application of the bylaw
Mont-Royal	Replace water meters		X				Number of meters replaced
Mont-Royal	Municipal bylaw – yard watering		X				Application of the bylaw
Outremont	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the current bylaw		X			Application of the bylaw
Pierrefonds-Roxboro	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the current bylaw		X			Number of notices issued
Pointe-Claire	Adopt a bylaw on drinking water usage	Regulate the use of drinking water on the territory of the ville de Pointe-Claire				X	Bylaw number
Rivière-des-Prairies–Pointe-aux-Trembles	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the bylaw		X			Number of requests Summer blue patrol
Sainte-Anne-de-Bellevue	Bylaw on drinking water usage	Apply the current bylaw		X			Application of the bylaw

Adaptation measures for drought: Ensure the quality and quantity of drinking water

BRIEF 5.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Sainte-Anne-de-Bellevue	Reduce as much as possible, according to our ability, the city's water consumption, and prevent water leakage from the municipal aqueduct system	Reduce by 15% the water needs of residents, institutions, businesses and industries as compared to 2012		X			Volume of water consumed
Saint-Laurent	Harvest wastewater from the splash pads to water plants			X			Number of systems installed
Saint-Léonard	Apply Bylaw RCG 13-023 on drinking water usage	Conduct surveillance			X	X	Number of warnings and notices issued
Senneville	Apply Bylaw RCG 13-011 on drinking water usage (reconstituted cities)					X	
Verdun	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Currently being applied (territory surveillance) Special emergency measures plan (SEMP)		X			Number of notices issued Two drinking water distribution points in case of emergency
Ville-Marie	Bylaw on drinking water usage (Bylaw RCG 13-023)	Apply the current bylaw		X			Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Apply Bylaw RCG 13-023 on drinking water usage (boroughs)	Apply the bylaw	X				Number of inspections
Westmount	Work with other municipalities to have the agglomeration take climate change into account along with its consequences for Montréal's water supply					X	Number of meetings
Westmount	Encourage regional, provincial, federal and international bodies to intensify efforts aiming to reduce the contamination of the water flowing through the Great Lakes – St-Lawrence basin and mitigate the impact of climate change					X	Number of meetings

Adaptation measures for drought

INCREASE INFRASTRUCTURES' AND BUILDINGS' RESILIENCE TO SOIL DRYING

Benefits

- Ensure solid constructions that respond to the evolution of climate parameters

Potential co-benefits

- Prevention of costs incurred for major renovations
- Ensuring the longevity of buildings and infrastructures

Constraints and maladaptation risks

- Water infiltration into building basements when foundations are fissured

Why?

Lack of precipitation may cause contraction and settling in clay soils. This soil drying can cause damage, among others, to sidewalks, streets and building foundations.

What we can do

- Adjust construction regulations to ensure that foundation footings are designed to respond to soil characteristics
- Manage surface water
- Promote the Stabilization of Residential Building Foundations financial aid program for buildings affected by ground collapse (Service de mise en valeur du territoire – territory development department)
- Map at-risk areas
- Put early detection methods into place for structural failure

Adaptation measures for drought: Increase infrastructures' and buildings' resilience to soil drying

BRIEF 5.2

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la gestion et de la planification immobilière (property planning and management department)	Building standards/standardized specifications	Include criteria relative to climate change adaptation in standardized documents		X
Service de la mise en valeur du territoire (territory enhancement department)	Stabilization of Residential Building Foundations program	The program aims to provide financial assistance to owner-occupiers in order to consolidate their residences when they are affected by subsidence	X	

Adaptation measures for drought: Increase infrastructures' and buildings' resilience to soil drying

BRIEF 5.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Anjou	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Inform citizens when the program is in place		X			Number of communication plans
Baie-D'Urfé	Study soils related to this issue					X	Number of projects
Côte-des-Neiges–Notre-Dame-de-Grâce	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Collaborate with the Service de la mise en valeur du territoire (territory enhancement department)		X			Number of communication plans
LaSalle	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence					X	Number of communication plans
Le Plateau-Mont-Royal	Propose achange to the urban planning bylaw that aims to control urban heat islands and improve the percolation of rainwater	Adopt and apply the bylaw				X	Application of the bylaw
Le Sud-Ouest	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Inform all affected citizens				X	Number of communications sent
Le Sud-Ouest	Communicate to citizens in the Côte-Saint-Paul area about the financial assistance program to stabilize building foundations affected by subsidence	Inform the citizens most susceptible to subsidence	X	X		X	Number of memos sent

Adaptation measures for drought: Increase infrastructures' and buildings' resilience to soil drying

BRIEF 5.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mercier–Hochelaga-Maisonneuve	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Upon request, a professional is assigned to respond to citizens		X			Number of communication plans
Montréal-Nord	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Already done by the borough's inspectors	X				Number of communication plans
Rivière-des-Prairies–Pointe-aux-Trembles	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Promote the program by refering to the Direction de l'habitation (housing department)		X			
Saint-Laurent	Adapt to innovations in the realm of building construction material resilience	Allow the use of high-performance materials		X			Number of construction materials changed
Saint-Laurent	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence			X			Number of citizens reached
Saint-Léonard	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Promote with the Bureau Accès Montréal (citizen service points) Promote at the Fête du citoyen (citizen festival)				X	Number of communication plans

Adaptation measures for drought: Increase infrastructures' and buildings' resilience to soil drying

BRIEF 5.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Verdun	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Put into application (information on the program)				X	Number of requests
Ville-Marie	Bylaw on building construction and transformation (11-018)	Apply the bylaw		X			Application of the bylaw
Ville-Marie	Quebec Construction Code (L.R.Q. B1-1, r.2)	Apply the bylaw		X			Application of the bylaw
Villeray–Saint-Michel–Parc-Extension	Inform citizens from targeted areas about the Service de la mise en valeur du territoire (territory enhancement department) financial support program to stabilize building foundations affected by subsidence	Make the pamphlet available to citizens in the Bureau Accès Montréal (citizen service points)		X			Number of communication plans

Adaptation measures for drought

INCREASE PLANTS' RESILIENCE TO DROUGHT

Benefits

- Limitation of drought's impacts on plants

Potential co-benefits

- Savings on the purchase of replacement plants
- Protection of biodiversity

Constraints and maladaptation risks

- Major costs associated with irrigation measures
- Lack of labour

Why?

By affecting vegetation, aquatic environments and fauna, drought can weaken biodiversity. As well, plants and trees subjected to water stress are much more vulnerable to insects and diseases.

What we can do

- Provide adequate irrigation for plants during droughts
- Select plants that are adapted to occasional drought conditions
- Choose types of plantings that require less irrigation; for example, by planting directly in the ground as opposed to using pots
- Use mulch to reduce the heat and evaporation on the soil's surface

Adaptation measures for drought: Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Encourage the use of drought-resistant landscaping for urban spaces and private residences	Raise awareness among residents through the borough's site and via activities with our partners		X			Number of citizens reached
Ahuntsic-Cartierville	Reduce the use of annual flowers and favour perennials and shrubs	Transition our landscaping and favour a mix of plants		X			Number of plants
Ahuntsic-Cartierville	Use rich soil when planting plants in urban projects	Carry out for all landscaping sites and parks		X			Surface area concerned in square metres (m^2)
Ahuntsic-Cartierville	Plan expanded tree trenches (5 m^3) and continuous tree trenches for planting public trees	Favour expanded tree trenches and continuous trenches		X			Number of trenches expanded and continuous trenches
Ahuntsic-Cartierville	Increase the use of mulch (RCW) in landscaping to reduce watering needs	Carry out for all landscaping sites and parks		X			Quantity of mulch used
Ahuntsic-Cartierville	Increase compost top dressing operations in public green spaces	Purchase specialized equipment		X			Number of operations
Ahuntsic-Cartierville	Raise citizen awareness of good gardening practices for green spaces and favour biodiversity (top dressing, aeration, addition of clover into grass mixes, use of compost and green fertilizers, etc.)	In collaboration with our partner Ville en Vert		X			Number of citizens reached
Ahuntsic-Cartierville	Increase ecological management for green spaces. Make sure the population considers this practice acceptable	Take measures toward combatting common ragweed				X	Number of sites
Ahuntsic-Cartierville	Provide adequate plant irrigation during droughts			X			Number of actions taken
Anjou	Increase the use of mulch in landscaping to reduce watering needs	Continue to use mulch and increase its use on the borough's territory	X				Number of places
Anjou	Encourage the use of drought-resistant landscaping for residences and urban spaces		X				Number of places

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Anjou	Replace the use of annuals with perennials and shrubs	Favour species that easily adapt to various contexts				X	Number of plants
Anjou	Use the city's land to test out more natural landscaping	The use of the city's land will be optimized to include varied and sustainable landscaping				X	Number of projects or square metres (m^2)
Baie-D'Urfé	Increase the use of mulch in landscaping to reduce watering needs					X	Quantity of mulch used
Baie-D'Urfé	Distribute free mulch to residents			X			Quantity of mulch distributed
Baie-D'Urfé	Replace the use of annuals with perennials and shrubs			X			Number of plants
Baie-D'Urfé	Promote the use of perennials and shrubs to citizens					X	Types of dissemination
Baie-D'Urfé	Encourage the use of drought-resistant landscaping for residences and urban spaces					X	Types of dissemination
Baie-D'Urfé	Provide adequate plant irrigation during droughts			X			Number of actions taken
Beaconsfield	As needed, maintain or reduce the proportion of annuals and increase that of perennials		X				Surface area of annuals
Côte-des-Neiges–Notre-Dame-de-Grâce	Increase the use of mulch in landscaping to reduce watering needs	Use of mulch in landscaping and parks		X			Quantity of mulch used
Côte-des-Neiges–Notre-Dame-de-Grâce	Encourage the use of drought-resistant landscaping for residences and urban spaces	Forthcoming for residences			X		Surface area concerned in square metres (m^2)
Côte-des-Neiges–Notre-Dame-de-Grâce	Replace the use of annuals with perennials and shrubs	In most cases, replace the park surface area for annuals with perennials				X	Number of plants
Côte-des-Neiges–Notre-Dame-de-Grâce	Use the city's land to test out more natural landscaping	Include test beds in the park projects that best lend themselves to it				X	Number of projects or square metres (m^2)

Adaptation measures for drought: Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Côte-Saint-Luc	Increase the use of mulch in landscaping to reduce watering needs	Depending on landscaping; in some cases, mulch is not appropriate, because the soil is too wet				X	Quantity of mulch used
Côte-Saint-Luc	Encourage the use of drought-resistant landscaping for residences and urban spaces	Municipal Bylaw 2217-46, all unbuilt land must be grassed		X			Surface area concerned in square metres (m^2)
Côte-Saint-Luc	Replace the use of annuals with perennials and shrubs			X			Number of plants
Côte-Saint-Luc	Provide adequate plant irrigation during droughts	Tank trucks to water street baskets and pots daily; annuals once or twice a week		X			Number of systems installed
Dollard-Des Ormeaux	Use the city's land to test out more natural landscaping					X	Number of projects or square metres (m^2)
Dollard-Des Ormeaux	Increase the use of mulch in landscaping to reduce watering needs			X			Quantity of mulch used
Dollard-Des Ormeaux	Encourage the use of drought-resistant landscaping for residences and urban spaces			X			Surface area concerned in square metres (m^2)
Dollard-Des Ormeaux	Replace the use of annuals with perennials and shrubs			X			Number of plants
Dollard-Des Ormeaux	Provide adequate plant irrigation during droughts					X	Number of actions taken
Dorval	Replace the use of annuals with perennials and shrubs			X			Number of plants
Dorval	Use the city's land to test out more natural landscaping			X			Number of projects or square metres (m^2)
Kirkland	Use mulch in many public landscaping areas to reduce watering needs	Maintain the use of municipal mulch in most of our landscaping and increase it as needed		X			Number of tonnes of mulch
Kirkland	Encourage the use of drought-resistant landscaping	Educate each citizen who requests information on landscaping through the Green Line				X	Number of actions with citizens

Adaptation measures for drought:
Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Kirkland	Replace the use of annuals with perennials and shrubs	Make landscaping 80% perennials by 2020			X		Number of plants
Kirkland	Use the Hydro-Québec easement to test out more natural landscaping	Equip the easement of Hydro-Québec with 500 m² of wildflowers and natural woods by 2020				X	Number of square metres (m²)
Kirkland	Provide adequate plant irrigation during droughts	Maintain appropriate plant drainage and adjust it as needed		X			
Lachine	Increase the use of mulch in landscaping to reduce watering needs	In new landscaping works as much as possible			X		Quantity of mulch used
Lachine	Replace the use of annuals with perennials and shrubs	In new landscaping works as much as possible			X		Number of plants
LaSalle	Replace the grass in some park areas by other plants			X			Surface area concerned in square metres (m²)
LaSalle	Increase the use of mulch in landscaping to reduce watering needs			X			Quantity of mulch used
LaSalle	Encourage the use of drought-resistant landscaping for residences and urban spaces	Revise the bylaw				X	Adoption of the bylaw
LaSalle	Replace the use of annuals with perennials and shrubs	Carried out for borders and underway for beds	X		X		Number of plants
LaSalle	Use the city's land to test out more natural landscaping	Carry out three projects				X	Number of projects or square metres (m²)
LaSalle	Provide adequate plant irrigation during droughts			X			Number of actions taken
Le Plateau-Mont-Royal	Increase the use of mulch in landscaping to reduce watering needs			X			Quantity of mulch used
Le Plateau-Mont-Royal	Encourage the use of drought-resistant landscaping for urban spaces					X	Surface area concerned in square metres (m²)

Adaptation measures for drought: Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Le Plateau-Mont-Royal	Replace the use of annuals with perennials and shrubs	Educate citizens to plant perennials				X	Number of tree plots
Le Plateau-Mont-Royal	Replace the use of annuals with perennials and shrubs in municipal landscaping			X			Number of plants
Le Plateau-Mont-Royal	Require expanded tree trenches	500 trenches (including those to replace trees cut down due to the emerald ash borer)		X			Number of trenches expanded
Le Plateau-Mont-Royal	Provide adequate plant irrigation during droughts	Continue to experiment with rain gauges and water only when necessary		X			Surface concerned in square metres (m^2)
Le Sud-Ouest	Increase the use of mulch in landscaping to reduce watering needs	Continue to use mulch in landscaping works		X			Number of borders visited
Le Sud-Ouest	Encourage the use of drought-resistant landscaping for residences and urban spaces	Éco-quartier aspect Parks division aspect: list plant purchases		X			Surface area concerned in square metres (m^2)
Le Sud-Ouest	Replace the use of annuals with perennials and shrubs	Replace according to the list of annual and perennial plantings		X			List of annual and perennial plantings
Le Sud-Ouest	Use the city's land to test out more natural landscaping	Wherever possible				X	Number of projects or square metres (m^2)
Le Sud-Ouest	Provide adequate plant irrigation during droughts	Watering adaptation based on temperature and plant needs		X		X	Monitoring list for plant watering
Le Sud-Ouest	Implement the urban forestry plan	Implement the urban forestry plan				X	Plan execution
L'Île-Bizard–Sainte-Geneviève	Increase the use of mulch in landscaping to reduce watering needs		X				Quantity of mulch used
L'Île-Bizard–Sainte-Geneviève	Replace the use of annuals with perennials and shrubs	Increase of 20%				X	Number of plants
L'Île-Bizard–Sainte-Geneviève	Provide adequate plant irrigation during droughts			X			Number of actions taken

Adaptation measures for drought: Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Mercier–Hochelaga-Maisonneuve	Increase the use of mulch in landscaping to reduce watering needs	Systematic use of mulch in all our planting		X			Quantity of mulch used
Mercier–Hochelaga-Maisonneuve	Encourage the use of drought-resistant landscaping for residences and urban spaces	Plant choices based on specific site conditions				X	Surface area concerned in square metres (m^2)
Mercier–Hochelaga-Maisonneuve	Replace the use of annuals with perennials and shrubs	Replace half the surface area used for annuals in parks by perennials				X	Park planting surface area
Mercier–Hochelaga-Maisonneuve	Use the city's land to test out more natural landscaping	When site conditions are favourable (ex.: parcs Vaisseau d'Or and Carlos d'Alcantara)				X	Number of projects or square metres (m^2)
Mercier–Hochelaga-Maisonneuve	Provide adequate plant irrigation during droughts	In new tree plantings, require watering over a three-year period				X	Number of trees irrigated
Montréal-Nord	Provide adequate plant irrigation during droughts					X	Number of actions taken
Montréal-Ouest	Replace the use of annuals with perennials and shrubs	50% of annuals have been replaced		X			Number of plants
Montréal-Ouest	Replace annuals by perennials and shrubs			X			Surface area of annuals
Montréal-Ouest	Implement the urban forestry plan					X	Plan execution
Mont-Royal	Increase the use of mulch in landscaping to reduce watering needs					X	Quantity of mulch used
Mont-Royal	Replace the use of annuals with perennials and shrubs			X			Number of plants
Mont-Royal	Use the city's land to test out more natural landscaping					X	Number of projects or square metres (m^2)
Mont-Royal	Replace the grass with white clover on public lands and parks			X			Surface area concerned in square metres (m^2)
Mont-Royal	Provide adequate plant irrigation during droughts					X	Number of actions

Adaptation measures for drought: Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Outremont	Replace the use of annuals with perennials and shrubs	± 4,000 perennials: add ± 500 new perennials and reduce ± 1,000 annuals per year		X			Number of plants
Outremont	Use the city's land to test out more natural landscaping	Campus Outremont project				X	Number of projects
Outremont	Provide adequate plant irrigation during droughts	Additional watering chosen		X			Number of actions
Pierrefonds-Roxboro	Adequately irrigate plants during droughts	Maintain adequate plant drainage and adjust as needed		X			Number of actions
Pointe-Claire	Use mulch in many public landscaping areas to reduce watering needs	Continue to use municipal mulch in most of our landscaping works and increase it as needed		X			Number of tonnes of mulch
Pointe-Claire	Replace the use of annuals with perennials and shrubs	Replacement of annuals with perennials where landscaping permits.		X			Number of plants
Pointe-Claire	Provide adequate plant irrigation during droughts	Protect plants in case of drought		X			Number of actions
Rivière-des-Prairies–Pointe-aux-Trembles	Increase the use of mulch in landscaping to reduce watering needs	Already in place for trees and shrubs Not applicable for annuals		X			Quantity of mulch used
Rivière-des-Prairies–Pointe-aux-Trembles	Use the city's land to test out more natural landscaping	Include test beds in park projects that lend themselves to it				X	Number of projects or square metres (m^2)
Rivière-des-Prairies–Pointe-aux-Trembles	Provide adequate plant irrigation during droughts	Already in place as part of our regular operations		X			Number of actions taken
Rosemont–La Petite-Patrie	Increase the use of mulch in landscaping to reduce watering needs	On curb extensions and borders		X			Quantity of mulch used
Rosemont–La Petite-Patrie	Encourage the use of drought-resistant landscaping for residences and urban spaces	This is part of the criteria for evaluating planting projects		X			Surface area concerned in square metres (m^2)
Rosemont–La Petite-Patrie	Replace the use of annuals with perennials and shrubs	Low-maintenance perennials and shrubs are chosen for new projects on public land		X			Number of plants

Adaptation measures for drought: Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rosemont–La Petite-Patrie	Use the city's land to test out more natural landscaping	Underway in parc Étienne-Desmarteau: plant the hill using ecological management (native grasses)		X			Surface area concerned in square metres (m^2)
Rosemont–La Petite-Patrie	Landscaping that favours biodiversity	My Space for Life Garden Program (bird garden, edibles garden and biodiversity garden) and Un jardin pour tous (a garden for everyone) urban agriculture project on the Centre Rosemont grounds	X		X		Number of landscaping projects
Rosemont–La Petite-Patrie	Choose a variety of tree species for planting	Favour biological diversity for the street and park canopy		X			Tree record
Sainte-Anne-de-Bellevue	Encourage the use of drought-resistant landscaping for residences and urban spaces			X			Surface area concerned in square metres (m^2)
Sainte-Anne-de-Bellevue	Replace the use of annuals with perennials and shrubs			X			Number of plants
Sainte-Anne-de-Bellevue	Provide adequate plant irrigation during droughts			X			Number of actions taken
Saint-Laurent	Encourage the use of drought-resistant landscaping for residences and urban spaces	Verify each proposed landscaping plan, taking special note of species chosen Monitor planting		X			Identification of species to choose and dissemination of this information
Saint-Laurent	Adapt plants based on the new hardiness zone			X			Number of plants
Saint-Léonard	Increase the use of mulch in landscaping to reduce watering needs	Mulch around trees Mulch in floral landscaping (city hall)			X	X	Number of projects or square metres (m^2)
Saint-Léonard	Encourage the use of drought-resistant landscaping for urban spaces	Choose drought-resistant landscaping for urban spaces				X	Number of drought-resistant landscaping projects
Saint-Léonard	Replace the use of annuals with perennials and shrubs	City hall landscaping Park landscaping				X	Percentage of perennials used
Saint-Léonard	Use the city's land to test out more natural landscaping	Ecological management for green spaces (parc Wilfrid-Bastien, near maison Joseph-Gagnon)				X	Number of projects or square metres (m^2)

Adaptation measures for drought:
Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Saint-Léonard	Provide adequate plant irrigation during droughts				X		Number of systems installed
Senneville	Increase the use of mulch in landscaping to reduce watering needs					X	
Senneville	Replace the use of annuals with perennials and shrubs					X	Number of plants
Senneville	Use the city's land to test out more natural landscaping					X	Number of projects or square metres (m^2)
Senneville	Provide adequate plant irrigation during droughts					X	
Verdun	Increase the use of mulch in landscaping to reduce watering needs	Change and apply the bylaw		X			Quantity of mulch used
Verdun	Encourage the use of drought-resistant landscaping for residences and urban spaces	Change and apply the bylaw		X			Surface area concerned in square metres (m^2)
Ville-Marie	Gradually minimize water consumption in the borough's operations. Use more mulch in borders to reduce evapotranspiration and thus reduce plant watering needs			X			Quantity of mulch used
Ville-Marie	Choose adapted plants					X	Number of plants
Ville-Marie	Protect and add native tree species, native plants and ecological gardens, working jointly with experts from the Botanical Garden	Target work in community gardens, on public land and in parks as well as in large housing developments such as the Habitations Jeanne-Mance		X			Number of meetings
Villeray–Saint-Michel–Parc-Extension	Increase the use of mulch in landscaping to reduce watering needs	Standardize the practice		X			Quantity of mulch used
Villeray–Saint-Michel–Parc-Extension	Replace the use of annuals with perennials and shrubs	Reduce by 5% per year			X		Number of plants

Adaptation measures for drought: Increase plants' resilience to drought

BRIEF 5.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Villeray–Saint-Michel–Parc-Extension	Use the city's land to test out more natural landscaping	Carry out a yearly project			X		Number of projects or square metres (m^2)
Villeray–Saint-Michel–Parc-Extension	Provide adequate plant irrigation during droughts	Select appropriate technology according to physical conditions (drip irrigation)		X			Number of actions taken
Westmount	Increase the use of mulch in landscaping to reduce watering needs		X				Quantity of mulch used
Westmount	Encourage the use of drought-resistant landscaping for residences and urban spaces		X				Surface area concerned in square metres (m^2)
Westmount	Replace the use of annuals with perennials and shrubs	One third of all the city's plants		X			Number of plants
Westmount	Distribute native tree species to residents	Trees are distributed to residents each year. The tree choice includes native tree species and fruit trees. We distribute about 65 trees per year		X			Number of trees distributed
Westmount	Expand the flower and plant exchange program to promote the distribution of native plants for residential landscaping	The city holds a perennial exchange and sale each year to promote native plants		X			
Westmount	Encourage residents and the industrial, commercial and institutional sectors to use native plants in their landscaping	*Guide #6 aménagement paysage*r (guide #6 for landscaping) for Bylaw 1305, site planning and architectural integration program (SPAIP)		X			
Westmount	Examine the possibility of extending the use of native species to passive recreation areas in parks and other public planting spaces and evaluate the advantages of such a measure		X				
Westmount	Change municipal bylaws to encourage the use of drought-resistant plants					X	Change to the bylaws
Westmount	Provide adequate plant irrigation during droughts		X				Number of actions taken

BRIEF 6.1

Adaptation measures for river floods

INCREASE INFRASTRUCTURES' AND BUILDINGS' RESILIENCE TO RIVER FLOODS

Benefits

- Protection of infrastructures and buildings located in flood-prone areas

Potential co-benefits

- Major investment cycles due to the advanced age of many public infrastructures (culverts, overpasses, roads, etc.) are a good opportunity to promulgate standards and practices that take into account the potential impacts of climate change, including river floods.

Constraints and maladaptation risks

- Slowdowns for some developments
- Usage conflicts

Why?

Floods alongside a watercourse often happen when snow melts, in times of heavy spring rains and when frazil ice forms in the winter. These floods cause damages to homes and buildings as well as to the road network and bridges, and also cause combined sewer system overflows and sewer system backflows. So it is important to equip infrastructures and buildings to handle such events.

What we can do

- Ensure that regulations are in keeping with the Montréal agglomeration's new development scheme as concerns the dispositions relative to protecting river banks, coast and flood-prone areas
- Take climate change into account when designing infrastructures
- Intensify maintenance programs and failure detection methods
- Maintain a river flood prediction program

Adaptation measures for river floods: Increase infrastructures' and buildings' resilience to river floods

BRIEF 6.1

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Take action on public land to protect existing buildings located in flood-prone areas	In times of flooding, add sandbags		X			Number of bags used for each flood
L'Île-Bizard–Sainte-Geneviève	Promote the protection of existing buildings located in flood-prone areas		X				
Montréal-Nord	Promote the protection of existing buildings located in flood-prone areas	Emergency measures plan already in place: – at-risk homes are already catalogued; – regular monitoring of the river level by public works.		X			
Pierrefonds-Roxboro	Take action on public land to protect existing buildings located in flood-prone areas	Elevate boulevard Lalande and naturalize the shoreline			X		Project execution
Senneville	Promote the protection of existing buildings located in flood-prone areas					X	
Verdun	Promote the protection of existing buildings located in flood-prone areas	Distribute prospectus		X			Number of prospectus given out

BRIEF 6.2

Adaptation measures for river floods

DEVELOP EMERGENCY MEASURES FOR FLOOD-PRONE AREAS

Benefits

- Protects the population, their belongings and the environment by planning interventions that are the responsibility of the cities and boroughs
- Optimizes the effectiveness of crisis management interventions

Potential co-benefits

- Reduces the risks to public health
- Minimizes material costs for disasters

Constraints and maladaptation risks

- Difficult to coordinate among numerous players

Why?

During a river flood, we must act quickly to mitigate the damages to citizens and infrastructures. Planning emergency measures serves not only to prevent the risks of emergency states by measuring the human and economic impacts of a disaster, but also to review the relevance of the means deployed during events and improve the related tools. When well planned, emergency measures can protect citizens and living environments and help minimize damage.

What we can do

Strengthen our intervention capacity by collaborating closely with the Centre de sécurité civile, which has a multidisciplinary team, to implement emergency measures (also applies to other extreme weather events).

In particular:

- Make sure the tools are up to date:
  - the borough's Emergency, Relief and Missions Plan
  - the Special Response Plans (SRP) for flooding and for river floods
- Locally, keep employees' training up to date for this type of risk
- Maintain and calibrate the measurement and alert system based on new climate issues, among others by monitoring water levels
- Inform landowners and residents living in exposed areas

Adaptation measures for river floods: Develop emergency measures for flood-prone areas

BRIEF 6.2

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de sécurité incendie de Montréal – Centre de sécurité civil (fire safety service – civil protection centre)	Special response plan – floods (updated annually)	Monitor the water levels of rivière des Prairies and the St-Lawrence River to foresee and plan the actions which the cities and boroughs are responsible for carrying out in case of flooding in order to protect the population, their property and the environment	X	

Adaptation measures for river floods: Develop emergency measures for flood-prone areas

BRIEF 6.2

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Collaborate closely with the civil protection centre to implement special response plans (SRPs): flooding SRP and river flood SRP	Meet with the civil protection centre		X			Number of participants at meetings
Ahuntsic-Cartierville	Develop an emergency plan for spring river floods to facilitate emergency operations on public land	Use book for operations on the ground	X				Book used for operations on the ground
Ahuntsic-Cartierville	Adopt a local Emergency, Relief and Missions Plan (ERMP)	Disaster victim assistance sections developed. Reception centres and shelters have been determined		X			Adoption of the plan
LaSalle	Adopt a local Emergency, Relief and Missions Plan (ERMP) and/or update it based on climate change vulnerability analysis results	Annually update the ERMP		X			Adoption of the plan
LaSalle	Collaborate closely with the civil protection centre to implement special response plans (SRPs): flooding SRP and river flood SRP			X			Number of meetings
L'Île-Bizard–Sainte-Geneviève	Adopt a local Emergency, Relief and Missions Plan (ERMP) and/or update it based on climate change vulnerability analysis results	Annually update the ERMP		X			Adoption of the plan
L'Île-Bizard–Sainte-Geneviève	Collaborate closely with the civil protection centre to implement special response plans (SRPs): flooding SRP and river flood SRP			X			Number of meetings
Montréal-Nord	Adopt a local Emergency, Relief and Missions Plan (ERMP) and/or update it based on climate change vulnerability analysis results	Emergency measures plan already in place Update the ERMP this fall, management team will attend the proposed training program		X			Adoption of the plan

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Montréal-Nord	Collaborate closely with the civil protection centre to implement special response plans (SRPs): flooding SRP and river flood SRP	Emergency measures plan already in place Update the ERMP this fall, management team will attend the proposed training program		X			Number of meetings
Pierrefonds-Roxboro	Develop an emergency plan for spring river floods to facilitate emergency operations on public land	Disseminate the emergency plan within our organization		X			Plan implementation and plan improvement after each use
Rivière-des-Prairies–Pointe-aux-Trembles	Adopt a local Emergency, Relief and Missions Plan (ERMP) and/or update it based on climate change vulnerability analysis results	Annually update the ERMP		X			Adoption of the plan
Rivière-des-Prairies–Pointe-aux-Trembles	Collaborate closely with the civil protection centre to implement special response plans (SRPs): flooding SRP and river flood SRP	Communications at appropriate times when a situation occurs (spring and fall)		X			Number of meetings
Sainte-Anne-de-Bellevue	Update the city's emergency measures	Annual action plan 2015			X		Updated measures
Senneville	Adopt a local Emergency, Relief and Missions Plan (ERMP) and/or update it based on climate change vulnerability analysis results					X	
Senneville	Collaborate closely with the civil protection centre to implement special response plans (SRPs): flooding SRP and river flood SRP					X	

Adaptation measures for river floods

INCREASE THE STABILITY OF RIVER BANKS FACING EROSION

Benefits

- Increase river banks' resilience to erosion caused by intense river floods and the increased variability of the moisture balance

Potential co-benefits

- Preservation of biodiversity and improvement of the living environment
- Improvement of water quality

Constraints and maladaptation risks

- Avoid the use of potentially invasive plants

Why?

Winter and spring river floods can cause river bank erosion. Because of their roots, plants (trees, shrubs and herbaceous plants) stabilize banks and hold down the soil. As such, they directly protect the land against soil erosion. Because tree and shrub root systems are more developed than those of herbaceous plants, they provide more protection against erosion.

What we can do

- Put programs into place to return river banks to their natural state
- Revegetate river banks
- Pursue the acquisition of riverside properties in order to protect those environments

Adaptation measures for river floods: Increase the stability of river banks facing erosion

BRIEF 6.3

Departments that will implement this measure

DEPARTMENT	PLANS, POLICIES, PROGRAMS AND OTHER INITIATIVES	ORIENTATIONS, OBJECTIVES, ACTIONS IN RELATION TO THE HAZARD	UNDERWAY	2020
Service de la mise en valeur du territoire (territory enhancement department)	Schéma d'aménagement et de développement de l'agglomération de Montréal – Schéma (2015) (Montréal urban agglomeration land use and development plan – in French only)	**Orientation**: Favour the protection of river banks, shores and floodplains **Objectives:** – Protect river banks, shores and floodplains; prevent them from degrading and promote their restoration – Ensure the safety of people and goods and protect the typical flora and fauna of the floodplain while considering the environment's biological features – Ensure the natural drainage of water The boroughs and municipalities must make their urban planning bylaws consistent with the provisions of section 4.8.2 of the companion document. The implementation of provisions relative to the protection of river banks, shores and floodplains thus falls to the boroughs and municipalities	X	
	Plan de l'eau (2015) (water plan (2015) – in French only)	– Landscaping project for river banks with constant waves – Support program to increase access to and views of rivière des Prairies	X	

Adaptation measures for river floods: Increase the stability of river banks facing erosion

BRIEF 6.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Ahuntsic-Cartierville	Put programs into place to renaturalize public river banks	Landscaping of street ends leading toward the river River bank stabilization projects				X	Kilometres (km) of shoreline
Ahuntsic-Cartierville	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))	Bring our regulations up to standard				X	Adoption of the bylaw
Ahuntsic-Cartierville	Educate river-dwelling citizens about protecting and renaturalizing the river banks. Disseminate information about the various bank stabilization measures.	Include information on our site, plan educational activities with our partners		X			Number of citizens reached
Ahuntsic-Cartierville	Protect and develop the natural environments along the banks of rivière des Prairies. Prevent the loss of these ecosystems.	Inter-borough project to install speed reduction markers for motorboats in the river in order to minimize bank erosion				X	Number and type of projects carried out
Dorval	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))		X				Adoption of the bylaw
Lachine	Bank stabilization	Done in 2014	X				Kilometres (km) of stabilized shoreline
LaSalle	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))	Revise the bylaw				X	Adoption of the bylaw

Adaptation measures for river floods: Increase the stability of river banks facing erosion

BRIEF 6.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
LaSalle	Put programs into place to renaturalize river banks	When possible as part of reconstruction projects				X	Kilometres (km) of shoreline
L'Île-Bizard–Sainte-Geneviève	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))	Update forthcoming				X	Adoption of the bylaw
L'Île-Bizard–Sainte-Geneviève	Put programs into place to renaturalize river banks					X	Kilometres (km) of shoreline
Montréal-Est	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))		X				Adoption of the bylaw
Montréal-Nord	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))	Already included in the current Schéma (Montréal urban agglomeration land use and development plan)				X	Adoption of the bylaw
Montréal-Nord	Pursue the acquisition of shoreline properties in order to protect their environments	Visioning process toward eventually acquiring land for the borough				X	Kilometres (km) of shoreline concerned
Pierrefonds-Roxboro	Renaturalize public river banks	Establish a river bank / shore stabilization project		X			Kilometres (km) of stabilized shoreline
Rivière-des-Prairies–Pointe-aux-Trembles	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))	Change to the zoning bylaw				X	Adoption of the bylaw

Adaptation measures for river floods: Increase the stability of river banks facing erosion

BRIEF 6.3

Administrative units that will implement this measure

UNIT	COMMITMENTS	SPECIFIC OBJECTIVES (IF APPLICABLE)	COMPLETED	UNDERWAY	IN PREPARATION	2020	CHOSEN MONITORING INDICATOR (IF APPLICABLE)
Rivière-des-Prairies–Pointe-aux-Trembles	Put programs into place to renaturalize river banks	Systematically apply when projects lend themselves to it		X			Kilometres (km) of shoreline
Rivière-des-Prairies–Pointe-aux-Trembles	Maintain the collaborative relationship with the civil protection centre for the special response plan (SRP) for river floods in order to communicate the necessary information to the population	Aspect dealt with in the Emergency, Relief and Missions Plan (ERMP) in section 5.1: identification of risks and most plausible scenarios	X				Number of meetings
Sainte-Anne-de-Bellevue	Begin the proces of renaturalizing the river banks					X	Rate of river banks renaturalized
Senneville	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))					X	
Verdun	Revise the regulations on the protection of river banks, shores and floodplains (in keeping with the Schéma d'aménagement et de développement de Montréal (Montréal urban agglomeration land use and development plan))	Change and apply the bylaw		X		X	Adoption of the bylaw
Verdun	Put programs into place to renaturalize river banks	Prioritize the private lands on river banks on Île des Sœurs			X		Kilometres (km) of shoreline
Verdun	Pursue the acquisition of shoreline properties in order to protect their environments	Complete the circuit alongside the public-access river banks Acquisition process underway for Île des Sœurs				X	Kilometres (km) of shoreline

APPENDIX

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