

HORIZON 2031

PLAN DIRECTEUR DU RÉSEAU VÉLO MÉTROPOLITAIN

GRAND MONTRÉAL

ACCESIBLE

CONTINU

ATTRACTIF

CONVIVIAL

CONNECTÉ



SEPTEMBRE 2017
RÉVISÉ NOVEMBRE 2017

Version of September 2, 2017

Version of November 15, 2017: includes the summary description of the axes in Appendix 1.

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TECHNICAL SHEETS CAN BE CONSULTED
ON THE INTERACTIVE MAP OF OUR WEBSITE, AT THE ADDRESS;
[http://cmm.qc.ca/champs-intervention/transport/plans-en-transport/plan-
directeur-du-reseau-velo-metropolitain/#carte](http://cmm.qc.ca/champs-intervention/transport/plans-en-transport/plan-directeur-du-reseau-velo-metropolitain/#carte)

THE METROPOLITAN COMMUNITY OF MONTREAL

Created in 2001, the Communauté métropolitaine de Montréal is a planning, coordination and financing organization that brings together 82 municipalities where nearly 4 million people reside, spread over a territory of more than 4,360 km².

The Community exercises

strategic skills across Greater Montreal. Its main areas of intervention are economic development, land use planning, transportation, the environment, social housing and metropolitan facilities.

MISSION

Plan, coordinate and finance the strategic skills that shape the territory and the development of the region.

VISION

Set course for the world and build a competitive, attractive, united and responsible community.

OBJECTIVE

Join the leading group of North American regions by developing unifying projects that gain the support of elected officials, citizens and civil society.



PREAMBLE

Cycling has seen a remarkable boom in recent years. Like everywhere in Quebec, residents of the Montreal Metropolitan Community are cycling enthusiasts, an activity they engage in regularly and assiduously. According to Vélo-Québec's report on the state of cycling in 2015, more than 50% of adults (18-74 years old) in Montreal, Laval and Longueuil, regularly use bicycles to get to work, school, to visit friends or elsewhere. If this rate were applied to the entire territory, the Community would have more than two million citizens practicing this activity. It is not surprising that cycling is at the heart of one of the objectives set out in the Community's *Metropolitan Land Use and Development Plan* (PMAD), which proposes to promote active mobility in Greater Montreal by prioritizing the development of a utilitarian and recreational cycling network across the entire metropolitan territory.

INTEGRATED MOBILITY AND THE NEW URBAN AGENDA

Organized at the initiative of the UN, the Habitat III Conference concluded on 20 October 2016 with the adoption of the *New Urban Agenda*, which sets out a series of recommendations for transforming urban and metropolitan areas into safer, more resilient and more sustainable places. The *New Urban Agenda* places particular emphasis on sustainable mobility and the importance of a network of cycle paths to reduce congestion and pollution while promoting health and quality of life, as illustrated in the following excerpt:

"We will encourage national, subnational and local governments to develop and strengthen financing instruments to improve their transport and mobility infrastructure and systems, through: rapid transit networks, integrated transport systems, rail and air systems, safe, sufficient and adequate pedestrian and cycle paths, and technological innovations in transport and transit systems to reduce congestion and pollution while improving efficiency, connectivity, accessibility, health and quality of life."

Source: New Urban Agenda, paragraph 118.

This document presents the Master Plan for the Metropolitan Bicycle Network with a horizon of 2031. The routes forming this network were identified following a consultation with the 82 municipalities of the CMM. The proposal is detailed in the following pages. The implementation The establishment of this Metropolitan Bicycle Network is based on a partnership between the CMM, the 82 municipalities of the metropolitan region, the Regional Metropolitan Transport Authority and the Government of Quebec.

THE REGIONAL METROPOLITAN TRANSPORT AUTHORITY

The *Act mainly modifying the organization and governance of public transportation in the metropolitan region of Montreal* was adopted by the National Assembly of Quebec on May 16, 2016. This law provides for the entry into operation, on June 1, 2017, of the Regional Metropolitan Transportation Authority.

(ARTM) and the Réseau de transport métropolitain (RTM). The ARTM will be responsible for all planning and financing of public transportation in the Community, while the RTM will be responsible for operating trains and bus services in the North and South suburbs.

The ARTM's *Strategic Plan for the Development of Public Transit* will set out the vision, over a period of at least 10 years, for the development of public transit and, more generally, the mobility of people, and will indicate the equipment, infrastructure and public transit services required. The ARTM's *Strategic Plan for the Development of Public Transit* must be

approved by the CMM and must take into account the orientations, objectives and criteria of the *CMM Metropolitan Planning and Development Plan*.

"With a view to sustainable development and reducing the carbon footprint, the Authority's mission is to ensure, through collective transport, the mobility of people in its territory, including those with reduced mobility.

To this end, the Authority plans, develops, supports and promotes public transport. It promotes the integration of services between different modes of transport and increases the efficiency of road corridors.

The Authority works closely with the Minister and the Montreal Metropolitan Community to establish a comprehensive and integrated vision of mobility in its territory to, among other things, identify needs in terms of public transportation.

Source: *Metropolitan Regional Transport Authority Act*. Article 5.

1

CONTEXT

In effect since 2012, the Community's *Metropolitan Land Use and Development Plan* (PMAD) defines guidelines, objectives and criteria to ensure the competitiveness and attractiveness of Greater Montreal with a view to sustainable land use and development of the metropolitan area.

The PMAD gives an important place to the bicycle. This choice responds in particular to a desire expressed by the citizens of the metropolitan region who participated in the public consultation on the PMAD project.

A metropolitan cycle network for utility and recreation

During the public consultation on the PMAD project in spring 2011, several participants advocated for the development of a utility and recreational cycling network across the entire metropolitan area. Indeed, the development of cycling in relation to accessibility to TOD (Transit-Oriented Development) areas and employment centres had not been addressed in the PMAD project. Emphasizing the benefits of active transportation for health and for the environment, several stakeholders urged the CMM to include cycling in the development of more sustainable mobility across the Community, stating that the development of active transportation for recreational and utility purposes is also an important component of integrated planning for development and transportation across a metropolitan region like Montreal.

Sensitive to these arguments, the planning commission was to follow up on this request by recommending, in its consultation report, to integrate into the PMAD a concept of a metropolitan network of active utilitarian and recreational transportation that would be followed by a master plan. The proposal was subsequently retained in the final version of the PMAD, adopted in December 2011 by the CMM council.

A PROJECT DISCUSSED FOR SEVERAL YEARS

In 1998, Vélo Québec proposed to the Government of Quebec to develop a cycling network that would connect the municipalities of the territory and provide access to several destinations, employment centers, parks and recreational tourism sites. This idea resulted in the Metropolitan Bike Network, which was integrated into the Metropolitan Land Use and Development Plan (PMAD).

PUBLIC CONSULTATION ON THE PMAD DRAFT

In 2011, Greater Montreal experienced one of the most important exercises in participatory democracy in its history, during the public consultation on the *draft Metropolitan Land Use and Development Plan*. Nearly 350 briefs were submitted and analyzed by the Planning Commission, and nearly 1,400 people attended the public hearings.

IMPROVING THE HEALTH OF CITIZENS COMMITS TO A MORE COMPACT URBAN FORM AND THE PRACTICE OF CYCLING IS AN ELEMENT TO BE OPTIMIZED IN THE IMPLEMENTATION OF TOD NEIGHBORHOODS.

" The modal shift from cars to bicycles brings gains that are a function of the reduction in automobile traffic: reduction of air and noise pollution, reduction of GHG emissions, reduction of trauma risks. All these benefits therefore represent progress in terms of the environment and health. But, above all, regular cycling is a factor that promotes health, by reducing sedentary lifestyles and the incidence of several chronic diseases. "

Source: Public consultation report of the planning commission. Draft metropolitan planning and development plan – November 2011. Page 44.

PMAD and the bicycle

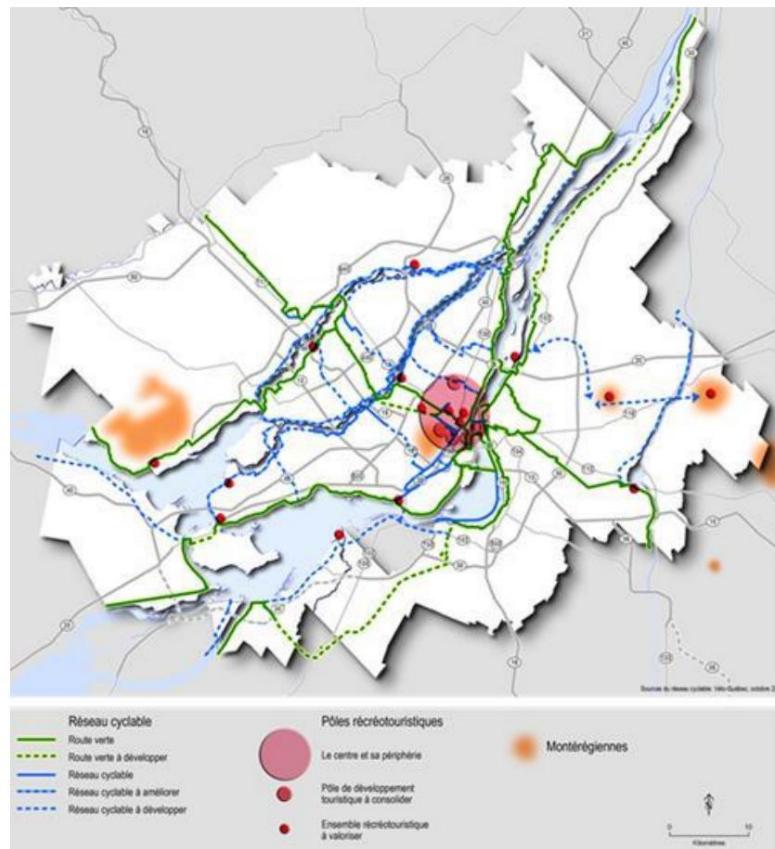
The PMAD aims to promote active mobility on a metropolitan scale (**objective 2.4**).

Already mentioned in the CMM's Vision 2025 statement adopted in 2003, the future Metropolitan Bike Network " would not only be an attractive facility for the citizens of Greater Montreal, but also a complementary product to the tourism offering " (p. 166). To achieve this, it is proposed to develop a cycling network for utilitarian and recreational purposes across the entire metropolitan area. The PMAD introduces the concept of "Metropolitan Bike Network", defined in the following terms (**criterion 2.4.1**) :

" The proposed Metropolitan Bike Network concept is designed to promote the completion and improvement of the existing cycling network and to ensure the connection between the different sectors of Greater Montreal. In its completed form, it consists of a continuous network of nearly 1,000 kilometres of cycle paths covering the entire metropolitan area and ensuring the connectivity of municipal cycling networks. The network would be developed according to recognized technical parameters to make it a pleasant and safe route to travel.

A signage of marking and destination will give it a signature.

The map below illustrates the concept of the Metropolitan Bicycle Network put forward in the PMAD.



Source: CMM. PMAD. December 2011.

As part of the PMAD's 2012-2017 Action Plan, the Community also confirmed its intention to identify a Metropolitan Bicycle Network to promote active mobility across the Greater Montreal territory.

The Metropolitan Bike Network is also identified as one of the components of the future Green and Blue Network of Greater Montreal. The implementation of the Green and Blue Network is one of the PMAD's environmental objectives (objective 3.5) and is based on the multiplication of sites of metropolitan interest highlighting the landscapes, protected natural environments and built heritage of the region, "accessible by cycling, waterways and public transit routes". (p. 196)

Cycling is also encouraged in the PMAD by the choice to concentrate 40% of new households in TOD-type neighborhoods by 2031. The creation of these sustainable living environments will serve to improve the quality of urban life with, in particular, the expected result of "improving public health by reducing dependence on cars and promoting active travel (cycling, walking)." (p. 81)

The objective of transferring the use of solo cars to active modes of transportation and public transportation will also contribute to the fight against climate change since the transportation sector represents the main sector of greenhouse gas (GHG) emissions. This sector contributes to 40% of the emissions of the Montreal metropolitan area.

A first metropolitan axis: the cycle and pedestrian path between Oka and Mont-Saint-Hilaire

After the PMAD came into effect in March 2012, the construction of the Oka to Mont-Saint-Hilaire Cycling and Pedestrian Trail was one of the first projects authorized by the CMM as part of an agreement with the Government of Quebec for the financing and implementation of the Greater Montreal Green and Blue Network. The Oka to Mont-Saint-Hilaire Cycling and Pedestrian Trail is the first axis of the Metropolitan Cycling Network. The Trail is scheduled to open in September 2017 and will be a legacy of the Community marking the 375th anniversary

Montreal's anniversary.



EXAMPLES OF INTERVENTIONS AS PART OF THE IMPLEMENTATION OF THE CYCLE AND PEDESTRIAN PATH BETWEEN OKA AND MONT-SAINT-HILAIRE.

New cycle path and upgrading of an existing section in Oka

In June 2016, the completion of a new section of the Trail located in Oka was announced. This section, completed thanks to a financial contribution of \$304,638, divided equally between MAMOT, CMM and the municipality of Oka, totals nearly 3 kilometers. The route

at the municipal quay, runs along Lac des Deux Montagnes on Saint-Sulpice Street, before taking Dupaigne and Saint-Jean-Baptiste Streets to then connect the Saint-Jean-Baptiste footbridge and Oka National Park. As a result, approximately 1,700 meters of the cycle path have been brought up to standard (including road markings and signage) and 1,100 meters of new cycle paths have been built on site



begins

own.

A plan to enhance landscape and heritage features, a signage master plan, an information terminal for the metropolitan cycling network at Parc du Millénaire and metropolitan directional signage are also planned along the route to enhance and maximize the cyclists' experience.

New route for the cycle and pedestrian promenade along the Saint-Laurent River in Boucherville and Longueuil

This new section will connect the existing bike paths in Longueuil and Boucherville to ensure a continuous route along the banks of the St. Lawrence River. This is a major project.

The total cost of the work will be approximately \$16 million, of which \$10 million will be shared equally by the Ministère des Affaires municipales et de l'Occupation du territoire and the CMM, and \$6 million by the cities of Boucherville and Longueuil. Access to the river will offer cyclists and walkers an exceptional outdoor experience. Recreation areas set up on the St. Lawrence River will allow everyone to fully enjoy it.



The Metropolitan Bicycle Network Signaling Plan



The Metropolitan Bike Network already has a distinctive signature. The creation of the Cycling and Pedestrian Trail between Oka and Mont-Saint-Hilaire involved, in particular, the development of a signage plan, adopted in December 2016.

The Metropolitan Bike Network Signage Plan – section of the Cycling and Pedestrian Trail between Oka and Mont-Saint-Hilaire provides for the installation of information signs, service signs, as well as various markers such as terminals and stops.

The Signaling Plan was adopted by the Community Executive Committee and can be viewed on the Community website.

CMM.

The Metropolitan Bicycle Forum

In June 2014, as part of the preparatory work for the establishment of the Metropolitan Bike Network, the Community, in collaboration with Vélo Québec, held the Metropolitan Bike Forum. Three half-day meetings were held in Montreal, Laval and Longueuil. The forum was aimed at elected officials, directors and professionals in planning, urban development and transportation from municipalities.

The Metropolitan Bike Forum was an opportunity to take stock of the state of the cycling network at the metropolitan level and to identify the main technical challenges and locally applicable solutions. The complementarity between cycling and public transport, and that of active mobility in TOD zones, were also highlighted. Examples of good practice cases were presented by representatives of municipalities, the Agence métropolitaine de Montréal (AMT) and the Ministère des Transports, du Développement durable et de l'Électrification des transports (MTDDET). The importance of targeted interventions to remove the main anthropogenic barriers hindering the development of cycling at the metropolitan level was also highlighted.

Following this event, Vélo Québec, in collaboration with the Community, produced a practical guide for the Community's municipalities entitled "*Metropolitan Bike Forum 2014: Developing the Metropolitan Bike Network .*"

Draft Master Plan for the Metropolitan Bicycle Network

As early as 2012, the Community began planning studies for the Metropolitan Bicycle Network and mandated Vélo Québec to support it in this process. The studies, completed in 2013, laid the foundations for identifying the Metropolitan Bicycle Network based on the concept proposed in the PMAD. Subsequently, the Community favored an approach based on consultation with the 82 municipalities as well as the 14 MRCs and agglomerations of the metropolitan territory.

All municipal partners were contacted and met for the first time during 2013. The purpose of these meetings was to explain the project and obtain the most complete and up-to-date information on municipal cycling networks, both existing and planned. The information obtained was then collected and analyzed. From the

Based on the information received and that already available, a set of cycle paths has been established. Planning documents concerning municipal cycling networks were also consulted, including the City of Montreal Transportation Plan, the City of Laval Active Mobility Plan, the City of Longueuil Active Mobility Plan and the Municipality of Terrebonne's Cycling Network Diagnostic and Action Plan to Promote Active Mobility. At the end of the exercise, an initial network proposal was developed by the Community and submitted to the municipalities in the winter of 2015, thus enabling the definition of the routes to be validated. Participants were also invited to propose alternative routes.

Following this consultation process, adjustments were made and incorporated into the draft Master Plan for the Metropolitan Bicycle Network, submitted for discussion in the summer of 2017. This master plan determines the Metropolitan Bicycle Network. In addition to the Bicycle and Pedestrian Trail between Oka and Mont-Saint-Hilaire, the Metropolitan Bicycle Network includes 70 routes totaling nearly 1,600 km. The master plan also identifies the objectives and targets for 2031, as well as an implementation framework. The following section provides a diagnostic

in which this project is included.

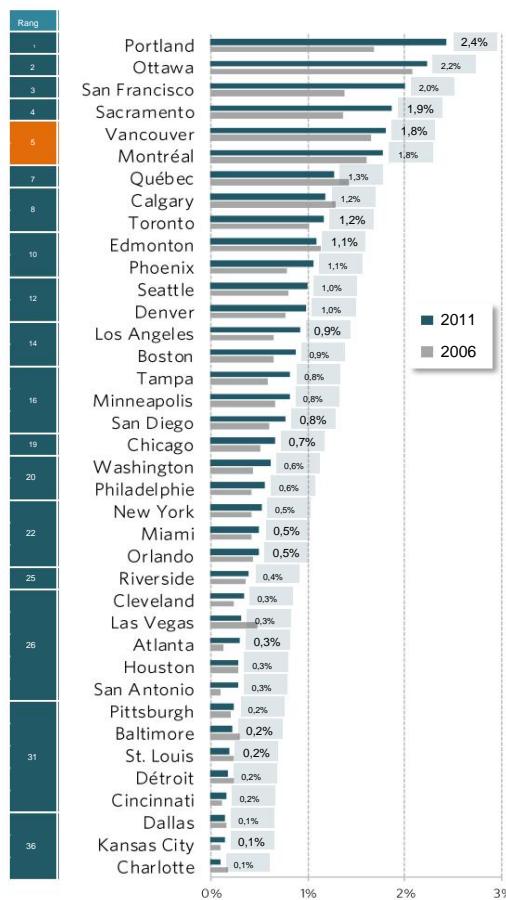
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DIAGNOSTIC

In the leading pack of “cyclable” metropolitan regions

Currently, the use of bicycles and the importance of its cycling network distinguish the Montreal metropolitan area on a North American scale. In North America, Greater Montreal, along with Vancouver, ranks 5th among metropolitan areas with the highest proportion of commuters using bicycles to get to work (1.8%), behind the regions of Portland (2.4%), Ottawa (2.2%), San Francisco (2%) and Sacramento (1.9%).

**Share of commuters using bicycle as primary mode of transportation
to work, 2006 and 2011, metropolitan area***



* U.S. metropolitan areas with populations of 2 million or more and the 7 most populous Canadian metropolitan areas in Canada.

Sources: Statistics Canada, *NHS* 2011; US Census Bureau, *ACS* 2011. Processing: CMM, 2017.

THE CITY OF MONTREAL AMONG THE MOST CYCLABLE METROPOLISES

In addition to having one of the highest modal shares of cycling in North America (3.2% for home-work trips), the city of Montreal has one of the largest cycling networks (788 km) and one of the largest self-service bicycle services (460 stations and 5,299 BIXI bikes).

According to the latest ranking by the Danish firm Copenhagenize Design Company, which measures the place of cycling in 122 cities with more than 600,000 inhabitants, Montreal ranks 2nd in North America and 20th worldwide among cycling metropolises. This ranking is based on 13 indicators of both a quantitative nature (modal share of cycling, gap between the proportion of men and women cyclists, etc.) and qualitative nature (influence of cycling promotion groups, consideration of cycling in urban planning, etc.).

Bicycle indicators, selected central cities of North American metropolitan areas

Ville*	% des navetteurs utilisant le vélo	Km de voies cyclables	Km de voies cyclables par KM ²	Nombre de stations de vélos en libre-service	Nombre de vélos en libre-service	Rang mondial des villes cyclables (Copenhagenize index)
	2011	2015-2016	2015-2016	2016	2016	2015
Minneapolis	3,6%	500	3,5	170	1 500	18
Montréal	3,2%	788	2,2	460	5 200	20
Portland	6,8%	668	1,9	100	1 000	top 30
San Francisco	3,7%	234	1,9	35	350	top 30
Seattle	3,7%	250	1,2	50	500	nd
Vancouver	4,4%	289	2,5	80	800	nd
Washington D.C.	3,3%	287	1,8	347	2 930	top 30

Note: The cities selected are the North American metropolises (cities) with the highest proportion of commuters using bicycles to get to work.

Sources: City of Montreal, BIXI, City of Vancouver, Biketown, Alliance for Biking & Walking, Copenhagenize Design Company, Statistics Canada, US Census. Processing: CMM, 2017.

<http://copenhagenize.eu/index/criteria.html>

The Greater Montreal Cycling Network

The Greater Montreal cycling network has developed in successive stages, through local municipal initiatives and structuring programs and projects of the Government of Quebec. The first bike paths were introduced in the 1970s, with the development of the banks of waterways and canals, including the Lachine Canal and the Aqueduct Canal. An initial planning phase was also carried out during the same period, at the initiative of the Communauté urbaine de Montréal, which brought together all the municipalities on the Island of Montreal. A second phase of development took place in the 1980s, initiated by the Programme d'aide à l'aménagement de voies cyclables set up by the Ministère des Transports du Québec in 1978. The launch of the Route verte in 1995 marked the beginning of a new phase of development, which made it possible to connect several of the major routes previously developed and to develop new ones.

More recently, a new phase of development resolutely focused on transportation was put in place, with the adoption of the City of Montreal Transportation Plan in 2008, and the support of the Government Assistance Program for Alternative Transportation Modes to the Automobile (PAGMTAA), in place since 2009, which is at the origin of many active mobility plans. These include the City of Laval Active Mobility Plan, the City of Longueuil Active Mobility Plan and the Action Plan to Promote Active Mobility in the

City of Terrebonne.

Currently, the bike paths in the Greater Montreal area extend over more than 2,200 km and represent all of the various local bike networks, regional bike circuits, to which are added the 360 km of the Route verte, a bike route that connects different regions of Quebec. The metropolitan area has several bike trails and networks for recreational tourism.

The entire cycle network includes different types of development – roadways designated cycle lanes, cycle paths and multi-use trails. The condition of the various cycle routes varies, with some of the existing segments in good condition and others requiring upgrading. Links are also missing. In some areas, the discontinuity between existing cycle routes is a barrier to optimal use of cycling.

THE GREEN ROUTE

A little over 360 km of Greater Montreal's cycle paths are part of the Route verte.

The idea for the Route verte dates back to the late 1980s. Inspired by other major projects of the kind, mainly in Europe and the United States, Vélo Québec presented an initial draft of the project in 1992. In 1995, Vélo Québec announced, in collaboration with the Government of Québec, the implementation of the Route verte, which would create a route linking Québec from west to east and from north to south. Year after year, the route took shape and took form thanks to the work and involvement of hundreds of partners across Québec. In 2008, Vélo Québec was awarded the International Leisure Innovation Award by the World Leisure organization. That same year, the Route verte was ranked among the ten most beautiful cycle routes in the world by the National Geographic Society. Today, regional and local partners are working in 16 administrative regions of Québec to complete or improve the Route verte.

Source : <http://www.routeverte.com/>

THE CYCLING AND WALKING PATH BETWEEN OKA AND MONT-SAINT-HILAIRE

The creation of a Green and Blue Network for Greater Montreal provided for in the Metropolitan Land Use and Development Plan (PMAD) focuses in particular on the development of a Metropolitan Bicycle Network, the first component of which will be the Cycling and Pedestrian Trail between Oka and Mont-Saint-Hilaire. With a length of 143 km, this trail:

- will connect the three national parks in the Montreal region (Oka Park, Îles de Boucherville and Mont Saint-Bruno Park) as well as the Mont Saint-Bruno Nature Center Hilaire (part of the UNESCO Biosphere Reserve);
- will cross 17 municipalities: Oka, Saint-Joseph-du-Lac, Pointe-Calumet, Sainte-Marthe-sur-le-Lac, Deux-Montagnes, Laval, Montreal, Saint-Lambert, Longueuil, Boucherville, Saint-Bruno-de-Montarville, Varennes, Sainte-Julie, Saint-Basile-le-Grand, McMasterville, Beloeil and Mont-Saint-Hilaire.

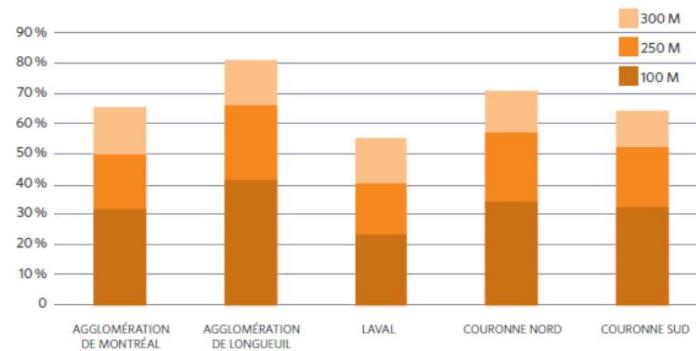
The development work for the creation of the cycling and walking trail between Oka and Mont-Saint-Hilaire will be completed in 2017 at a total cost of \$60 million, divided between the Government of Quebec, the CMM and the municipalities concerned.

Source : <http://cmm.qc.ca/champs-intervention/transport/dossiers-en-transport/transport-actif-et-reseau-velo-metropolitain/>

The proximity of a bike path is also one of the advantages enjoyed by residents of Greater Montreal municipalities. Thus, across the metropolitan area, two-thirds of homes are located 300 metres or less from a bike path, and half are 200 metres or less.

Proportion of housing with access to cycling infrastructure within a given radius,

Metropolitan Community of Montreal and its five sectors, 2013.



Sources: CMM, Vélo-Québec and MAMOT. Municipal assessment roles 2014. Processing: CMM, 2015.

Bridges and river shuttles

The territory of Greater Montreal is crossed by four main waterways that constitute major obstacles to cycling: the St. Lawrence River and the Prairies, Mille-Îles and Richelieu rivers. As such, bridges and river shuttles form strategic crossings for cyclists.

In total, 26 of the 41 bridges are accessible to cyclists. The bridges prohibited to cyclists are located on the motorway or railway network and do not have any facilities for cyclists.

In 2016, there were 14 river shuttles operating in Greater Montreal. These shuttles were concentrated on the St. Lawrence River and Lake Saint-Louis. The Ottawa River, the Rivière des Prairies and the Lachine Canal also had the possibility of being traveled by river shuttle. Only the shuttle on the Lachine Canal did not accommodate bicycles.

Fifteen municipalities in Greater Montreal were served by river shuttles, namely: Beauharnois, Boucherville, Châteauguay, Contrecoeur, Dorval, Hudson, Laval, Les Cèdres, L'Île-Dorval, Longueuil, Montreal, Notre-Dame-de-l'Île-Perrot, Oka, Repentigny and Varennes. The shuttles operate on a seasonal basis, ranging from a few weekends to several months. per year.

In 2016, river shuttles provided 479,438 trips in Greater Montreal.

The river shuttles are very closely linked to the cycling networks of Greater Montreal. Almost all of the docks used by Greater Montreal's river shuttles are located near a cycle path, that is, within a radius of 1 km or less from the Route verte, the Réseau vélo métropolitain project or a municipal cycle network.



STRONG INTEREST IN USING A RIVER SHUTTLE TO GET TO DOWNTOWN MONTREAL

A survey conducted in October 2016 by the Léger firm on behalf of the Rivière-des-Prairies–Pointe-aux-Trembles borough of the City of Montreal and the City of Repentigny reveals the interest of a large proportion of residents of these two municipalities in using a river shuttle to get to downtown Montreal.

Thus, 58% of Pointe-aux-Trembles residents and 42% of Repentigny residents, and more particularly workers, would be interested in using a river shuttle leaving from Place du Village-de-la-Pointe-aux-Trembles.

A majority of respondents would also be interested in having greater access to the St. Lawrence River to engage in various activities. Already, half of the residents of Pointe-aux-Trembles (52%) and Repentigny (50%) engage in activities on or near the St. Lawrence River, mainly in parks or on bike paths.

Source : www.leger360.com

Intermodality of bicycle and public transport

Public transport, car sharing and taxis represent other modes of transport which, combined with active modes of transport, form what is called intermodality or the transport cocktail.

Cycling and public transit have similar qualities and complementary characteristics. Cycling is the most efficient means of transportation over short distances, while public transit is the fastest for long distances. This is why municipalities and public transit organizations all have the goal of promoting intermodality between active transportation modes and public transit in their planning.

The bicycle can be used as a collector for major public transportation routes (metro, train and express bus). Thousands of bicycle racks are located throughout the metropolitan area, in the park-and-ride lots of commuter train stations and bus terminals, as well as near metro stations. In 2015, there were nearly 2,500 parking spaces located in the stations of the five commuter train lines and 1,500 spaces in the park-and-ride lots associated with the bus networks. In addition, there are 2,000 parking spaces at metro stations.

Furthermore, the accessibility of bicycles on public transport vehicles allows cyclists to cover great distances and obstacles such as waterways and sections of the road network that are prohibited or unwelcoming to them, such as motorways, bridges and tunnels. It provides access to the outskirts of large urban centres and their recreational and tourist cycling networks. Currently, bicycles are allowed on the metro and on suburban trains outside of peak hours. Some public transport companies have buses equipped with bicycle racks. Similarly, some taxi companies accept transporting bicycles on a rack or in a minivan.

BIKE STORAGE – DEUX-MONTAGNES STATION

This Vélostation is located in the incentive parking lot of the Deux-Montagnes train station. Registration is free and is reserved for users who subscribe to an OPUS+ or OPUS+ company subscription.



This Bike Station:

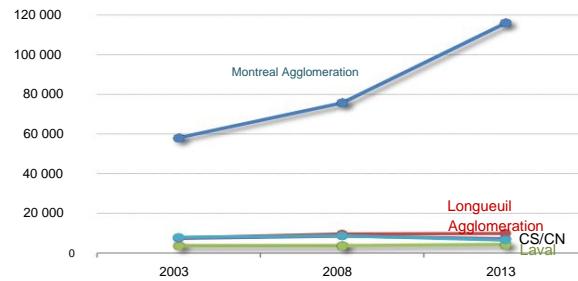
- has a sliding door that opens automatically;
- contains 78 seats in total;
- was designed for standard two-wheeled bicycles;
- is accessible 23 hours a day (closed from 3 a.m. to 4 a.m. for maintenance), 7 days a week and 365 days per year.

Recent developments in cycling practice

In the CMM territory, there has been an increase in the number of bicycle trips in the last decade. While in 2003, the results of the Origin-Destination survey showed some 87,000 trips made daily, entirely or partly by bicycle, the 2013 Origin-Destination (OD) survey brings this number to over 149,000 daily trips, including 143,600 made entirely by bicycle. Between 2003 and 2013, while the number of total trips (all modes combined) in the region during autumn working days increased by 12%, the number of bicycle trips increased by 69.3%.

Across the five major sectors of the region, we see that the increase in bicycle travel was mainly concentrated in the Montreal metropolitan area, where their number doubled (+99.5%) during this period.

**Number of daily trips made by bicycle in Greater Montreal,
by sector of origin of the trip, working days in autumn 2003-2013**



Source: Origin-Destination Surveys 2003 to 2013. Processing: CMM, 2017.

Modal share of journeys made by bicycle

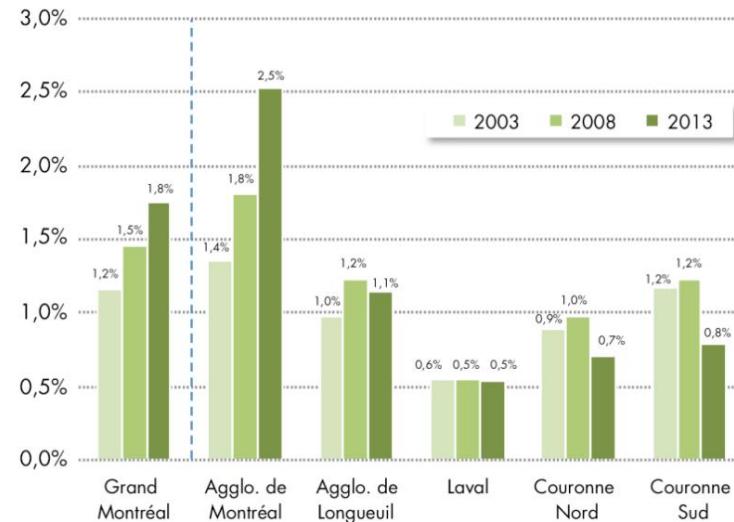
According to data from the latest Origin-Destination surveys conducted in Greater Montreal, the modal share of bicycle trips out of all trips increased in the region, from 1.2% to 1.8% between the fall of 2003 and the fall of 2013. It should be noted that with the four very distinct seasons that characterize Quebec's climate, the modal share of cycling fluctuates depending on the month of the year. Since the Origin-Destination surveys are conducted in the fall, the modal share of cycling would likely be underestimated.¹ Estimates by the Mobility Chair at Polytechnique Montréal show that this proportion would reach nearly 5% during the summer.

Among the five major geographic sectors of the region, the Montreal agglomeration is however the only sector to have seen an increase in the modal share of cycling since 2008, the other sectors of the Community having even recorded a decrease in their modal shares of cycling. The Laval and Longueuil sectors have remained relatively stable.

¹ The Origin-Destination (OD) surveys and Statistics Canada censuses are two of the main sources of data for tracking changes in cycling across Greater Montreal. The OD survey data have the advantage of covering all modes and reasons for travel (work, but also school, shopping or leisure). However, it should be noted that these data present the situation on fall working days and are not representative of other seasons of the year.

Statistics Canada census data have the advantage of allowing comparisons between Canadian metropolitan areas, but only for commuting. These data also have the advantage of being comparable to the American Community Survey (ACS) data conducted by the US Census Bureau and thus allow comparisons to be made between Canadian and US metropolitan areas in terms of modal shares of cycling for commuting.

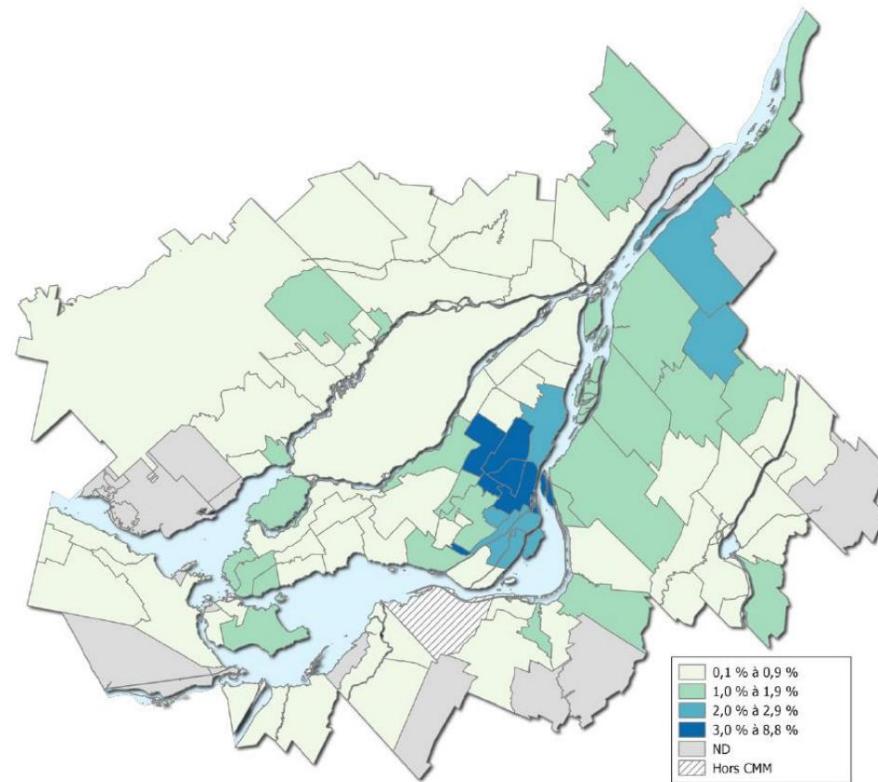
**Modal share of daily trips made by bicycle in Greater Montreal,
by sector of origin of the trip, working days in autumn 2003-2013**



Source: Origin-Destination Surveys 2003 to 2013. Processing: CMM, 2017.

In the territory of the Community, the sectors where the proportions of cyclists are the highest, namely the central sectors of the island of Montreal, have modal shares of cycling exceeding 3%, even in the fall period: this is the case of Plateau-Mont-Royal (8.8%), Rosemont–La Petite-Patrie (5.4%), Outremont (3.9%), Ville-Marie (3.5%) and Villeray–Saint-Michel–Parc-Extension (3.4%). The other sectors have lower modal shares of bicycles in general, with a few exceptions such as Verchères, Calixa-Lavallée, Varennes, Contrecoeur, Saint-Amable, Sainte-Julie, Boucherville, Mirabel, Deux-Montagnes, Laval-Ouest, Senneville, Sainte-Anne-de-Bellevue, Baie-D'Urfé, Vieux-Longueuil and Longueuil Est.

**Modal share of trips made by bicycle in Greater Montreal,
according to the municipality or district of origin of the trip, working days in fall 2013**

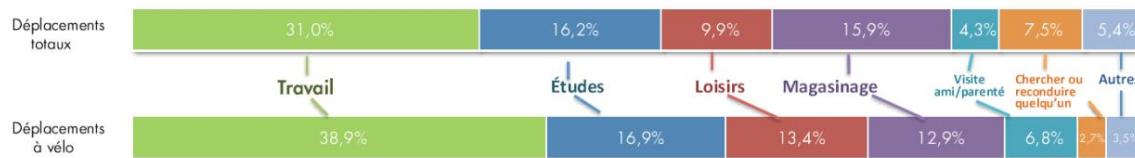


Source: Origin-Destination Survey 2013. Processing: CMM, 2017.

Reasons for travel by bicycle

Cyclists in Greater Montreal use their bikes on weekdays for a wide variety of reasons. The most important is work, which accounts for 38.9% of bike trips, followed by school (16.9%), leisure (13.4%) and shopping (12.9%).

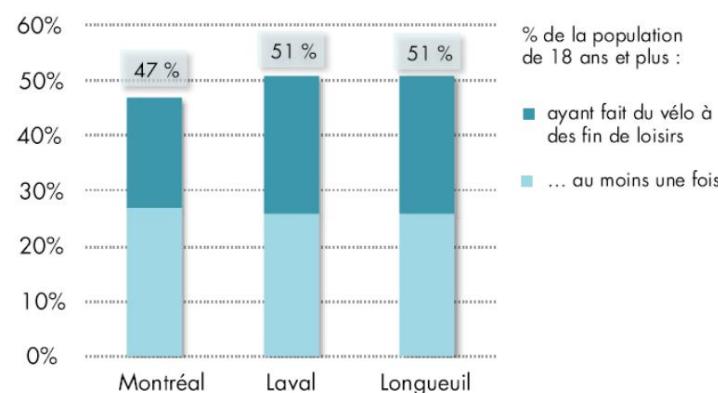
**Distribution of total daily trips and bicycle trips in Greater Montreal,
according to the reason (excluding return trips home), working days in autumn 2013**



Source: Origin-Destination Survey 2013. Processing: CMM, 2017.

This portrait, established using data from the 2013 Origin-Destination survey, only covers working days in the fall. In the summer and on weekends, the proportion of bicycle trips dedicated to leisure is probably higher. In connection with the use of bicycles for leisure purposes, data collected by Vélo Québec as part of *L'état du vélo au Québec en 2015* show that approximately 50% of the population of the cities of Montréal, Longueuil and Laval cycled for leisure in 2015 and that of this number, just over half did so at least once a week (including weekends) between May and August.

**Population aged 18 and over who cycled for leisure
between May and August 2015, cities of Montréal, Laval and Longueuil**

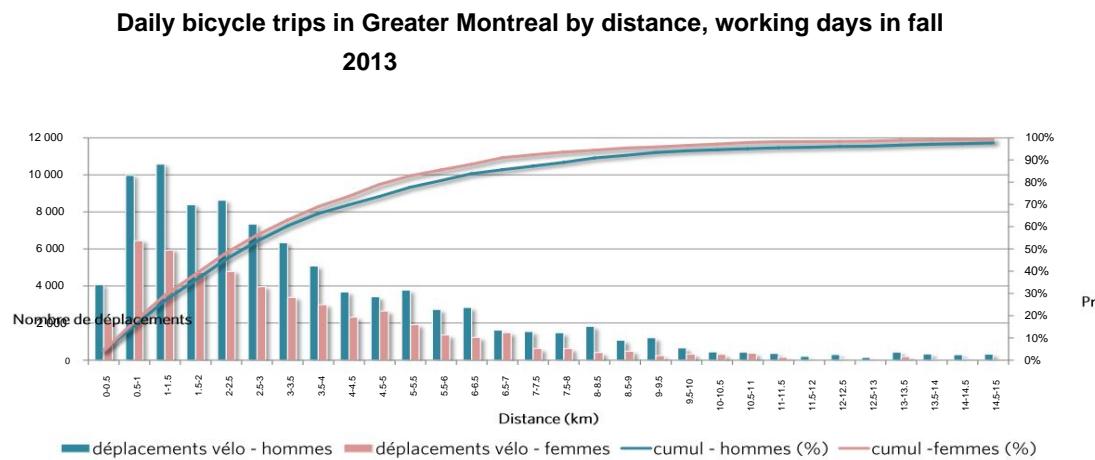


Note: The data comes from a survey whose number of respondents varies, depending on the city, between 400 and 449 people, with maximum margins of error between $\pm 4.7\%$ and $\pm 4.9\%$.

Source: Vélo Québec (2016). The State of Cycling in Quebec in 2015. Processing: CMM, 2017

Travel distance

For both men and women, the number of bicycle trips on weekdays is particularly high for short distances of 1.5 km or less, which account for almost 30% of all bicycle trips on weekdays in the region. The number of trips then decreases depending on the distance travelled. Around 75% of all bicycle trips do not exceed 5 km, for both men (74%) and women (79%).



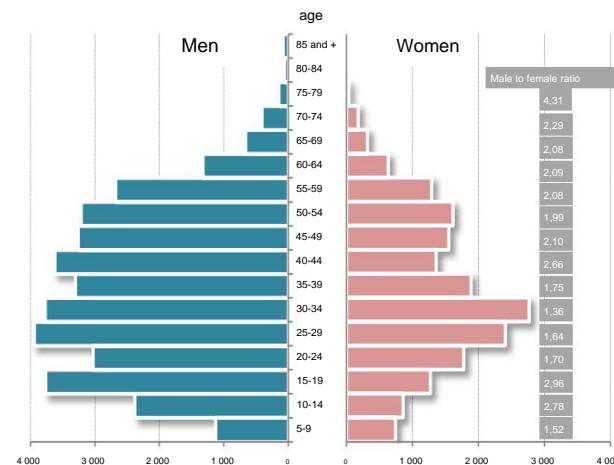
Source: Origin-Destination Survey 2013. Processing: CMM, 2017.

Some characteristics about cyclists

Women are less likely than men to use bicycles. In 2013, on working days during the autumn week, 66% of cyclists were men, for a male-female ratio of 2.0.

Regarding the age of cyclists, 85% of them are between 15 and 59 years old. Among men, cyclists are well distributed in the five-year age groups between 15 and 59 years old. Among women, 25 to 34 years old stand out as the age subgroup with the largest number of cyclists.

Distribution of cyclists by gender and age group in Greater Montreal, and male/female ratio by age group, working days in fall 2013



Source: Origin-Destination Survey 2013. Processing: CMM, 2017.

Factors influencing bicycle use

There is a large difference in the rates of cycling use between different countries and regions of the world. The same observation applies when comparing the rates of cycling use across the five sectors of the Community. Where do these differences come from and are there social, environmental or economic factors that promote or restrict the use of this mode of transport?

Several studies have focused on understanding the factors that can influence the use of bicycles. From the study by François Godefroy (Methodology for characterizing bike sharing and estimating the potential bicycle market in Montreal, University of Montreal, 2011), we retain four factors.

1. Cycling infrastructure

Among the different types of cycling infrastructure, cycle lanes and tracks have been commonly analyzed. Other types of infrastructure such as designated roadways and paved shoulders are road infrastructures that do not provide cyclists with a separate and distinct area, making the analysis of the impact of these infrastructures on the number of cyclists very complex.

Most studies on the influence of these infrastructures on bicycle use show that there is a positive correlation between the presence of cycle lanes or paths and the level of bicycle use. More specifically, one study showed that the increase in the use of cycle lanes is correlated with the presence of residential areas located less than 400 meters away. We should also mention two studies indicating that 20% of women who cycle would change their mode of transport in the absence of

of these infrastructures.

Other types of equipment such as bicycle parking spaces and all end-of-trip services, such as showers or lockers for clothes, have been commonly studied. The presence of bicycle parking has proven to be a favorable element for the development of cycling. Indeed, several studies show that cyclists' perception changes when there is parking at the end of the route, encouraging bicycle travel. Also, the presence of bicycle parking in public transport stations would be very favorable to the development of cycling and would contribute to the evolution of bimodal travel.

2. Safety on the roads

Cyclists are legally permitted to ride on the entire road network, and unless there is a specific restriction such as on motorways, they are also subject to the Highway Code.

A number of studies have shown that the perception of safety on the roads is fundamental in the choice of cyclists to use the bicycle as a mode of transport. Among the points raised to change the perception of safety, it appears that connectivity and accessibility to the network of cycle paths are crucial to ensure a perception

positive effect of bicycle travel. Also, it appears that the increase in bicycle travel has a positive effect on improving the safety of this mode of transport.

transport.

According to a survey commissioned by Vélo Québec as part of the production of the document *The State of Cycling in Quebec in 2015*, safety is the third most frequently cited reason by cyclists (adults who have cycled at least once during the year) in the three main cities in the region to explain why they do not use or do not use their bicycle more often as a means of transportation.

3. Neighborhood planning

The analysis of neighborhood types is also interesting to determine the characteristics influencing bicycle use. As mentioned in the study by François Godefroy (2011), "*the lengthening of distances between residences and different places of activity creates an insurmountable barrier with active modes. On the other hand, neighborhoods with a high population density, as well as a balance of retail stores and local services, are necessary factors for the development (sic) of the bicycle, because they allow for short-distance travel .*"

It should also be noted that there is a positive correlation between the presence of universities in a city and the level of bicycle use. Indeed, since students have a lower motorization, they generally use bicycles more than workers.

4. The climate

Seasons of course have a very significant impact on bicycle use levels. As previously demonstrated, the number of bicycle trips peaks in summer, slowly declines in autumn and then drops sharply in winter before gradually increasing again in spring. As for the impact of daily weather conditions, it turns out that temperature would have a moderate impact on bicycle use. However, it should be noted that occasional users would be most affected by precipitation and that modal choice also depends on cloud cover at 7 am.

Development potential

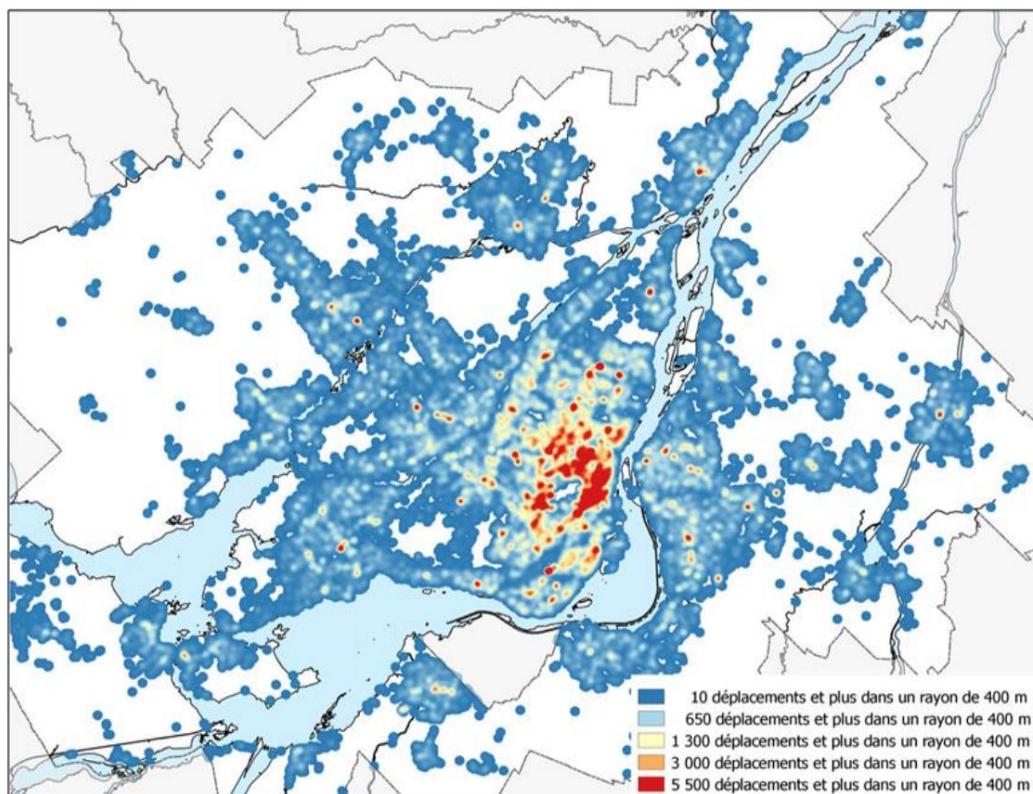
The Community has assessed, based on data from the 2013 Origin-Destination survey, the potential for modal shift from journeys made by motorised vehicles (car, bus, etc.) to bicycles. Of all the criteria applied, that of "distance travelled" is the most discriminating. In the Community, one in three workers (33%) lives less than 5 kilometres from their place of work, i.e. a journey of around 25 minutes by bicycle.

This shows the significant potential for modal shift towards cycling. Other criteria that have an impact on this potential for modal shift include the reason for travel and belonging to a travel chain which groups together patterned trips binding.

The estimation of the cycling potential shows that there is a strong potential for growth in the use of cycling in the Community. While there are currently some 149,400 bicycle journeys per day, it is estimated that there would be more than 1,800,000

motorized trips "potentially transferable" to this mode of transport. The modal share of cycling would jump from 1.8% to 24.6% in the CMM territory, a phenomenal growth of 22.8 percentage points. This result is similar to an analysis carried out by the Mobility Research Chair at the École Polytechnique de Montréal based on data from the 2008 Origin-Destination survey, which concluded that 22% of trips made in motorized vehicles – cars, buses, etc. – would be transferable to cycling². The following map illustrates the destinations of current and potentially cycling trips throughout the territory of the Community.

Concentrations of current and potential cycle travel destinations



Source: Origin-Destination Survey 2013. Processing: CMM, 2016.

² Source: Vélo-Québec. The state of cycling in Montreal in 2015. Page 9.

Nearly half of the potentially cycling trips would be trips made in the Montreal agglomeration, which is also the area where the majority of trips currently made by bike are concentrated. The Longueuil, Laval, North Shore and South Shore areas would share the other half of the potentially cycling trips. Note that this cycling potential is made up of trips of five kilometres or less, to which must be added an interesting growth potential in terms of currently dual-mode trips, i.e. using the car to get to public transit facilities.

3

OBJECTIVES AND TARGETS

1. POSITION GREATER MONTREAL AT THE FOREFRONT OF THE REGIONS BY 2031 NORTH AMERICAN CYCLABLES

Considering the public health and environmental benefits of cycling as a mode of transportation, ambitious targets for increasing travel and the modal share of cycling are proposed. Ultimately, this increase in bicycle use will position Greater Montreal as a leader in cycling regions across North America. The Community's targets are:

- ÿ Increase the number of daily bicycle trips, currently estimated at 149,400, to 360,000 daily trips³ by 2031; and
- ÿ Increase the proportion of home-work trips made by bicycle, by increasing the modal share of cycling from 1.8% in 2011 to 3.8 %⁴ in 2031, which could enable the Montreal metropolitan region to move from fifth to first place among cycling regions in North America⁵.

2. SET UP, BY 2031, A METROPOLITAN BICYCLE NETWORK WHICH PROMOTES VALUE THE ASSETS OF THE GREATER MONTREAL TERRITORY

As has been demonstrated in the metropolitan region and around the world, the development of a quality and safe transportation infrastructure that connects population areas to the territory's assets and activities induces new behaviors. The implementation, by 2031, of a complete and quality metropolitan cycling network will have the effect of increasing the use of cycling as a mode of transportation throughout the Greater Montreal territory. A continuous metropolitan cycling network connected to municipal cycling networks will give residents of the region better access to the territory's assets (natural and heritage spaces, commercial, health, education and employment sectors, as well as public transportation).

This objective also aims for a better sharing of public rights-of-way granted to active means of transport such as walking or cycling as part of daily activities. The development of a utility and leisure cycle network across the entire

³ 149,400 daily bicycle trips refers to the number of daily bicycle trips recorded in Greater Montreal during the OD survey held in the fall of 2013.

⁴ An overall modal share of 3.8% corresponds to an increase in the modal share of the city of Montreal from 3.4% to 7% and a increase in modal share outside the city of Montreal from 0.8% to 1.5%.

⁵ The modal share of 1.8% for bicycle commuting in Greater Montreal comes from the National Survey Statistics Canada 2011 Household Survey (NHS).

metropolitan territory, a complete and high-quality **Metropolitan Bike Network**, will not only be an attractive facility for the citizens of Greater Montreal, but also a complementary product to the current tourist offering. The Metropolitan Bike Network will be complementary to local cycling networks, on the one hand, and to the Route verte, on the other.

To this end, the targets targeted by the Community are as follows:

- ÿ Complete the entire metropolitan bicycle network by 2031.
- ÿ Improve, through the establishment of this Metropolitan Bicycle Network, the service to the assets of Greater Montreal identified in the *Metropolitan Plan for Land Use and Development* of the Community, namely:
 - TOD-type neighborhoods and public transport infrastructure;
 - employment centers, CEGEPs and universities, establishments in the network of health;
 - natural heritage sites, with emphasis on green corridors, i.e. large parks, bodies of water, green corridors, trails in parks, streets lined with mature trees, roads in agricultural or wooded areas;
 - places of cultural heritage (metropolitan facilities, recreational and tourist centers) with emphasis on historic areas and those where the quality of the buildings is remarkable.
- ÿ Improve the safety of cyclists by contributing to the reduction of accident rates in bike.
- ÿ Improve the “cycling experience” by integrating signage and destination signs throughout the metropolitan cycle network, particularly at intersections of main routes.

3. BECOME A MUST-SEE RECREATIONAL BIKE TOURISM DESTINATION IN NORTHEASTERN NORTH AMERICA.

The natural and cultural attractions of the metropolitan area are well known to tourists. The development of the Metropolitan Bike Network will provide new opportunities to discover the region through bike excursions. This objective can be achieved, in particular, by developing information and communication tools that promote Greater Montreal as a must-see recreational bike tourism destination.

To this end, the targets targeted by the Community are as follows:

- ÿ Develop information and communication tools promoting the Grand Montreal as a recreational cycling tourism destination;
- ÿ Increase the supply of self-service bicycles and rental bicycles to meet the needs of different categories of tourists;
- ÿ Encourage the establishment of reception infrastructure for tourists arriving with their bicycles – in particular places and equipment for assembling and disassembling bicycles – at the main entry points to the region (airport, train stations, intercity terminals);
- ÿ Connect municipal cycle networks to the Metropolitan Cycle Network and to the Road green;
- ÿ Increase tourism spending by cyclists in Greater Montreal by 10% by 20316 .

4. DEVELOP INTERMODALITY AND COMPLEMENTARITY OF THE BICYCLE NETWORK METROPOLITAN WITH PUBLIC TRANSPORT

Better alignment of cycle networks with public transport networks and the main generators of travel will maximise the potential for increasing bicycle travel for utilitarian purposes in the Community. The improvement cycle access to the main generators of travel and to public transport infrastructures is targeted by the development of the Metropolitan Cycle Network.

A systematic integration of the active mobility needs of people who will travel short journeys daily in TOD neighborhoods, on foot or by bike, is also

⁶ The Transat Tourism Chair estimated tourism spending by cyclists in Quebec for 2015 at \$696.6 million. Approximately \$108 million of this spending is attributable specifically to customers from outside Quebec. Analyses will be conducted to evaluate this spending across Greater Montreal.

target. Already, within the framework of the innovative demonstration projects of the Community, the issue of cycling in TOD areas has been raised by several. In the demonstration projects, several cycle path projects have been proposed. Planning is mainly oriented towards the development of bicycle paths, but sometimes also towards multifunctional links, improving or providing direct, safe and user-friendly access to public transportation. In addition to the implementation of the Metropolitan Bicycle Network, the Community hopes that municipalities and/or MRCs in the northern and southern suburbs of Greater Montreal will carry out detailed planning promoting, at the local level of TOD areas, active mobility and intermodality between active and public transportation modes.

The presence of bicycle racks distributed in park-and-ride lots, suburban train stations and bus terminals, as well as around metro stations, also constitutes an essential complementary measure for developing intermodality.

between cycling and public transport. Finally, the development of accessibility for bicycles on board public transport vehicles would allow cyclists to cover great distances and/or obstacles such as waterways and sections of the road network that are prohibited or unwelcoming to them, such as motorways, bridges and tunnels.

In order to develop intermodality and the complementarity of cycling with public transport, the Community has set itself the following targets:

- ÿ Ensure that by 2031, all TOD areas are connected to the bicycle network metropolitan;
- ÿ Increase the supply of bicycle parking at the main access points of the public transport so that the threshold of occupied places does not exceed 90%;
- ÿ Increase the number of bus routes equipped with bicycle racks to allow cyclists to combine bus-bicycle modes to reach destinations that are often less well served;
- ÿ Increase the supply of weather- and theft-protected bicycle parking to achieve a minimum ratio of one protected space for each open-air space at the main access points to the public transport network (stations at the end of the line and other busiest access points).

5. REDUCE NATURAL AND ANTHROPIC BARRIERS TO CYCLING BY PROVIDING CYCLING FACILITIES AND CONSOLIDATING THE RIVER SHUTTLE NETWORK

Anthropogenic and natural barriers are among the factors limiting cycling in certain areas of the region. These constraints are multiple and include highways, railways, but also the many waterways that cross the region.

In order to reduce the constraints linked to these barriers in terms of bicycle travel, the Community sets itself the following targets:

- ÿ Take advantage of major bridge repair work to include developments cycle paths;
- ÿ Create cycle facilities on all new bridges, including overpasses and underpasses;
- ÿ When building new infrastructure that constitutes barriers (motorways, railways, etc.), provide crossings for cyclists at sufficiently close intervals to ensure access on both sides;
- ÿ Connect the metropolitan bicycle network to a set of river shuttles.

4

THE METROPOLITAN BICYCLE NETWORK

Identification of the axes of the metropolitan bicycle network

The axes were defined by prioritizing existing developments, alignment with local and regional cycling networks, and ensuring the quality of the environment. An inventory of existing and planned cycling networks on the territory of the Community was carried out with the MRCs and municipalities and, when available, the planning of municipalities or MRCs concerning cycling and active networks was taken into account. These include the City of Montreal Transportation Plan and the updated map of the existing and planned cycling network, the City of Laval Active Mobility Plan, the City of Longueuil Active Mobility Plan and the City of Montreal Cycling Network Diagnostic and Action Plan to Promote Active Mobility

Terrebonne. The cycle routes proposed in these plans were considered when choosing the routes and the definition of the paths.

The Metropolitan Bike Network is made up of 70 routes totaling 1,600 km, in addition to the Bike and Pedestrian Trail between Oka and Mont-Saint-Hilaire. The Network crosses 78 of the 82 municipalities of Greater Montreal. Only the municipalities of L'Île-Cadieux, L'Île-Dorval, Terrasse-Vaudreuil and Vaudreuil-sur-le-Lac do not have any sections on their territory.

General criteria

The Metropolitan Bicycle Network will be:

- **Cycleable** from one end to the other and **accessible** to cyclists of all levels. It will be an attractive facility for all citizens of Greater Montreal and tourists.
- **Continuous**, allowing the crossing of the river, streams and anthropogenic barriers (motorways, railways) in complete comfort and safety. It will connect the main inhabited areas with green and blue spaces, historical and heritage areas and metropolitan facilities.
- **Connected** and complementary to local cycle networks and the Green Route. This connectivity will multiply alternative routes and allow for more efficient travel. effective.

Purpose of the axes and service to the territory

The axes of the Metropolitan Bicycle Network fulfill transport, leisure and tourism functions that meet the needs of cyclists.

In terms of serving the territory's assets, the criteria for choosing axes related to these aspects include:

- serving the main population areas and particularly mixed sectors built around public transport hubs (TOD areas identified in the PMAD);
- serving employment centers, CEGEPs and universities;
- serving recreational and tourist centers;
- the service and development of natural heritage, woods and forest corridors;
- the service and promotion of cultural heritage and metropolitan facilities;
- the connection with the Green Route and other regional and Canadian trails;
- connection to the shuttles.

Population basins

The primary objective of the Metropolitan Bike Network is to enable the population to turn to cycling to access their daily activities and leisure activities. The network must therefore serve the main population areas in each sector.

The population service criterion often overlaps with others, in particular because that historically, towns and villages were established on the banks of waterways (natural and cultural heritage, historical complexes often being in the centre of towns) and that major infrastructures (educational institutions, public transport stations) are, for the most part, in the centre of urbanised areas.

TOD areas and public transport

Neighborhoods developed according to the TOD principles are service areas for public transportation and local travel on foot and by bike. The service of public transportation facilities is one of the main criteria used to determine the Metropolitan Bicycle Network, to maximize the complementarity between cycling and public transportation.

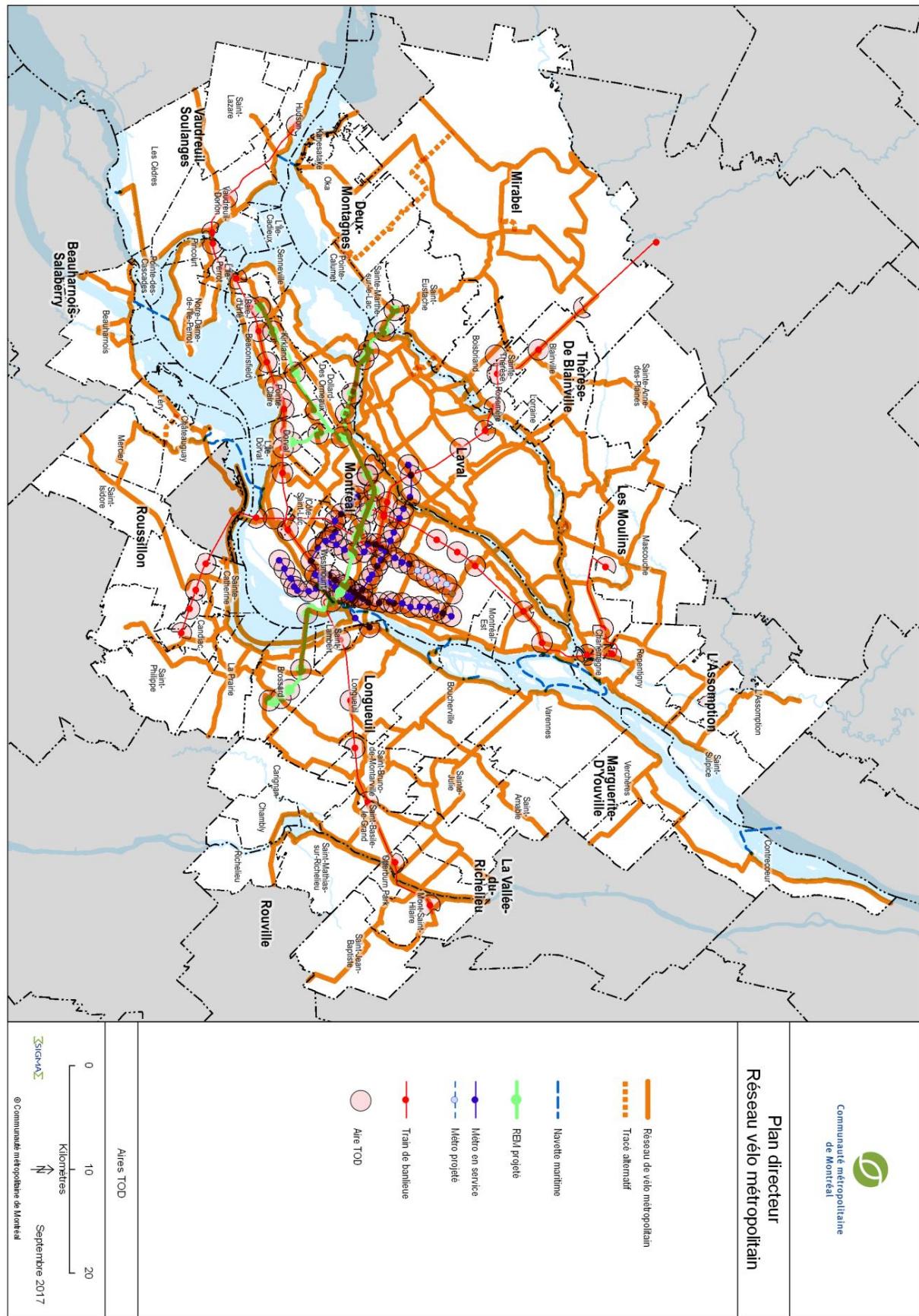
common.

LEVERAGING TOD NEIGHBORHOODS TO INCREASE UTILITY TRAVEL

The service of all TODs as proposed by the Metropolitan Bike Network will allow citizens living on their outskirts to access public transit by bike. To do this, the streets within the TODs must be user-friendly for cyclists. This same principle must apply to ensure travel from the network to schools, workplaces, businesses and other public facilities.

Map 1 illustrates the TOD areas and public transport facilities identified in the PMAD and their service by the Metropolitan Bicycle Network. The Metropolitan Bicycle Network serves 100% TOD areas, i.e. all 155 TOD areas planned in the PMAD. The 155 TOD areas served by the Network are located less than 2.5 km from it. This means that it also plays an important role in local travel within the TOD areas. The final connection to the heart of the TOD areas will be provided by local cycle networks and streets where traffic calming measures are provided.

41



Job centers, CEGEPs and universities

Work and studies generate regular travel, a greater proportion of which could be done by bicycle. Serving the main employment centres, as identified in the PMAD, and CEGEPs and universities is one of the main objectives of the Metropolitan Bike Network.

Thus, 100% of these are served by the Metropolitan Bicycle Network, namely:

- the 19 employment centers identified in the PMAD, including the most important: the city center, Saint-Laurent/Dorval, Anjou, Laval and Longueuil;
- the 134 colleges and universities (including the University of Montreal, the University of Quebec in Montreal, McGill University and Concordia University).

The finer branches to the final destination will be provided by cycle networks local.

Map 2 illustrates the employment centers identified in the PMAD and their service by the bicycle network metropolitan.

Natural heritage

The cycle network should provide access to natural areas, in the same way as the road network. Cycle facilities aimed at non-intensive activity can be integrated into the parks and near the riverbanks in order to enhance the natural environment while minimizing their impact and respecting environmental regulations. The Metropolitan Bike Network will provide access to the major elements of the Green and Blue Network of Greater Montreal, major parts of its natural heritage: bodies of water, large parks, green spaces, woodlands. It will connect with 93% of the 241 metropolitan woods and forest corridors in order to contribute to their enhancement, by facilitating access by bicycle to the routes

bordering or crossing these territories.

The establishment of the Cycling and Walking Trail between Oka and Mont-Saint-Hilaire confirmed the service to the three national parks of the metropolis (Oka, îles-de-Boucherville, Mont-Saint-Bruno) and the Mont Saint-Hilaire Nature Centre. The Metropolitan Cycling Network will serve all 22 recreational and tourist hubs identified in the PMAD, including the 17 major parks in Montreal, the Rivière-des-Mille-Îles park and the Nature Centre in Laval, the Marie-Victorin, Michel-Chartrand and de la Cité nature parks in Longueuil and the Domaine Vert park in Mirabel.

It will also provide access to the main bodies of water in the metropolis, including:

- the Saint-Laurent River and its widenings, Lake Saint-Louis and the La Prairie basin;
- the Prairie River;
- the Thousand Islands River;
- the Ottawa River and Lake of Two Mountains;
- the Richelieu River.

The Metropolitan Bicycle Network will finally allow the connection, at a distance of at most 2,500 m from all Greater Montreal quays served by river shuttles.

In terms of natural heritage, the Network will therefore serve:

- 224 metropolitan forests and corridors, or 93%;
- the 22 recreational tourism centers identified in the PMAD;
- all river shuttles.

Map 3 illustrates the parks and forest corridors served by the Metropolitan Bicycle Network.

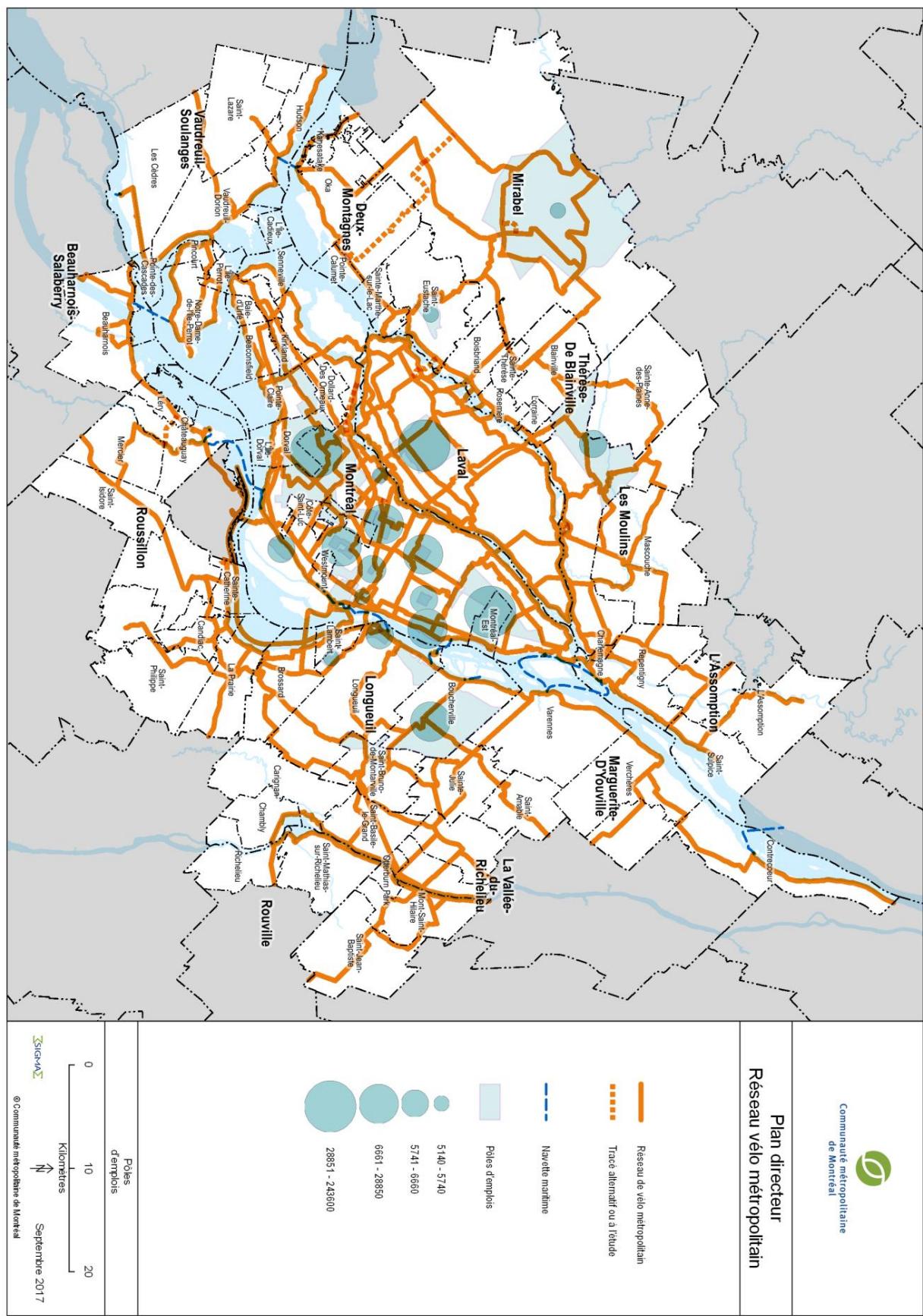
Cultural heritage

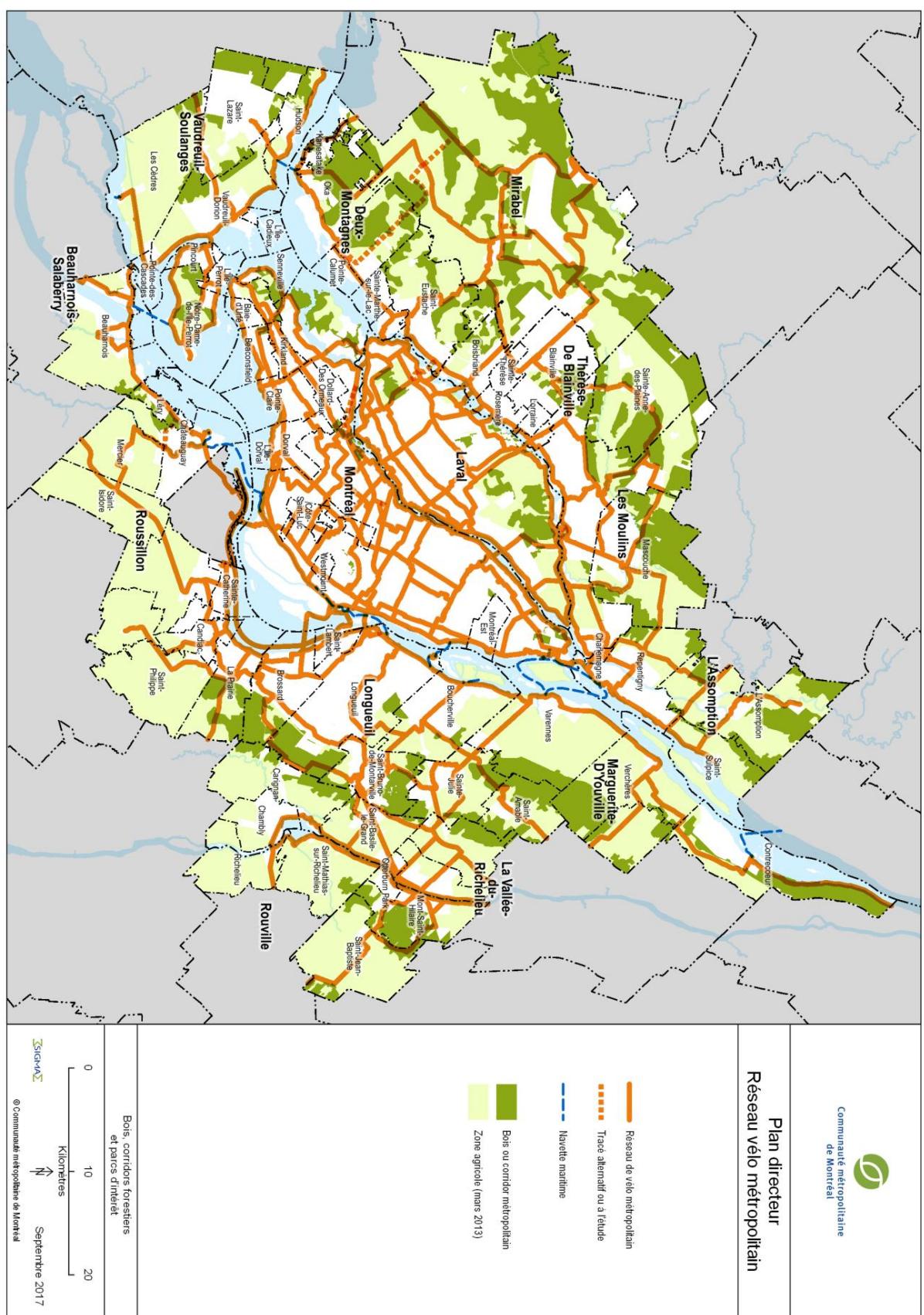
Access to the main elements of the cultural heritage of the metropolis is another of the criteria that was used to define the axes of the Metropolitan Bicycle Network. Among the facilities served directly, we note:

- The four metropolitan facilities as defined in the CMM Law (Botanical Garden and Insectarium, Biodome, Planetarium and Cosmodome).
- The 51 heritage sites of Greater Montreal, including Old Montreal, Pointe-Claire, Old Sainte-Rose in Laval, Old La Prairie, Île des Moulins in Terrebonne, etc.
- The national historic sites of Canada: the Chambly Canal, the Lachine Canal, the Fur Trade in Lachine, from Fort Chambly.

In summary, the Metropolitan Bicycle Network serves, at a distance of 2.5 km or less:

- 100% of TOD areas, or 155 of the 155 TOD areas identified in the PMAD.
- 100% of employment centers, i.e. the 19 employment centers identified in the PMAD, the largest of which are located in the center of the agglomeration (downtown, Saint-Laurent/Dorval, Anjou, Laval and Longueuil).
- 100% of metropolitan facilities, i.e. the four metropolitan facilities identified in the PMAD (the Botanical Garden [including the Insectarium], the Planetarium, the Biodome and the Cosmodome).
- 100% of colleges and universities, i.e. all 134 colleges and universities (including the University of Montreal, the University of Quebec in Montreal, McGill University and Concordia University) as identified in the PMAD and by the Government of Quebec, Ministry of Education, Recreation and Sports, 2017.
- 100% of recreational tourism centers, i.e. all 22 recreational tourism centers identified in the PMAD, including Sainte-Rose/Rivière-des-Mille-Îles, the Marguerite d'Youville wildlife refuge and Chambly.
- 93% of metropolitan woods and forest corridors.
- 100% of the heritage complexes of Greater Montreal, i.e. all 51 heritage sets identified in the PMAD.
- 100% of Greater Montreal river shuttles.





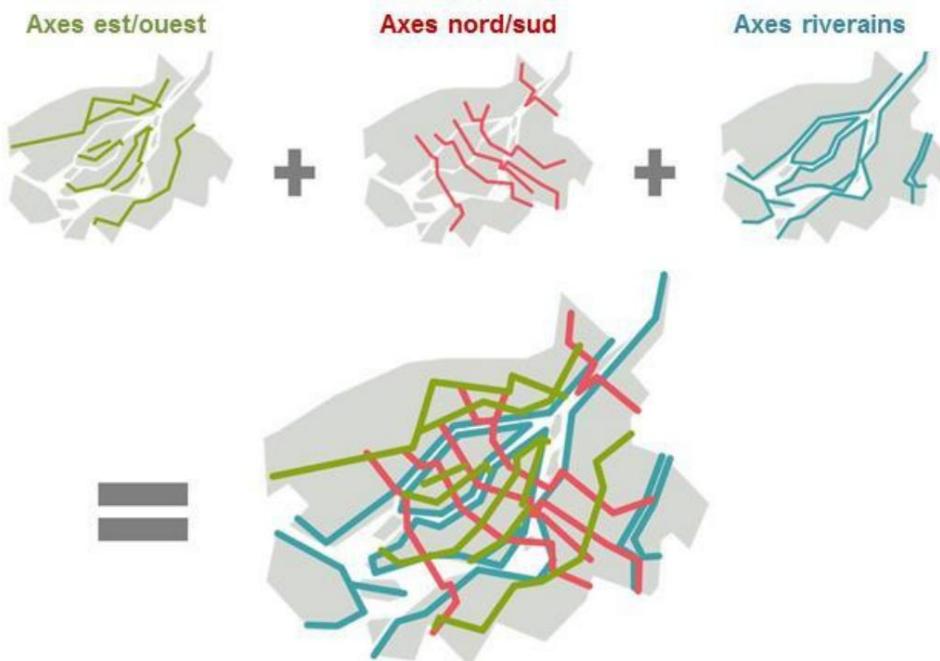
The axes of the metropolitan bicycle network

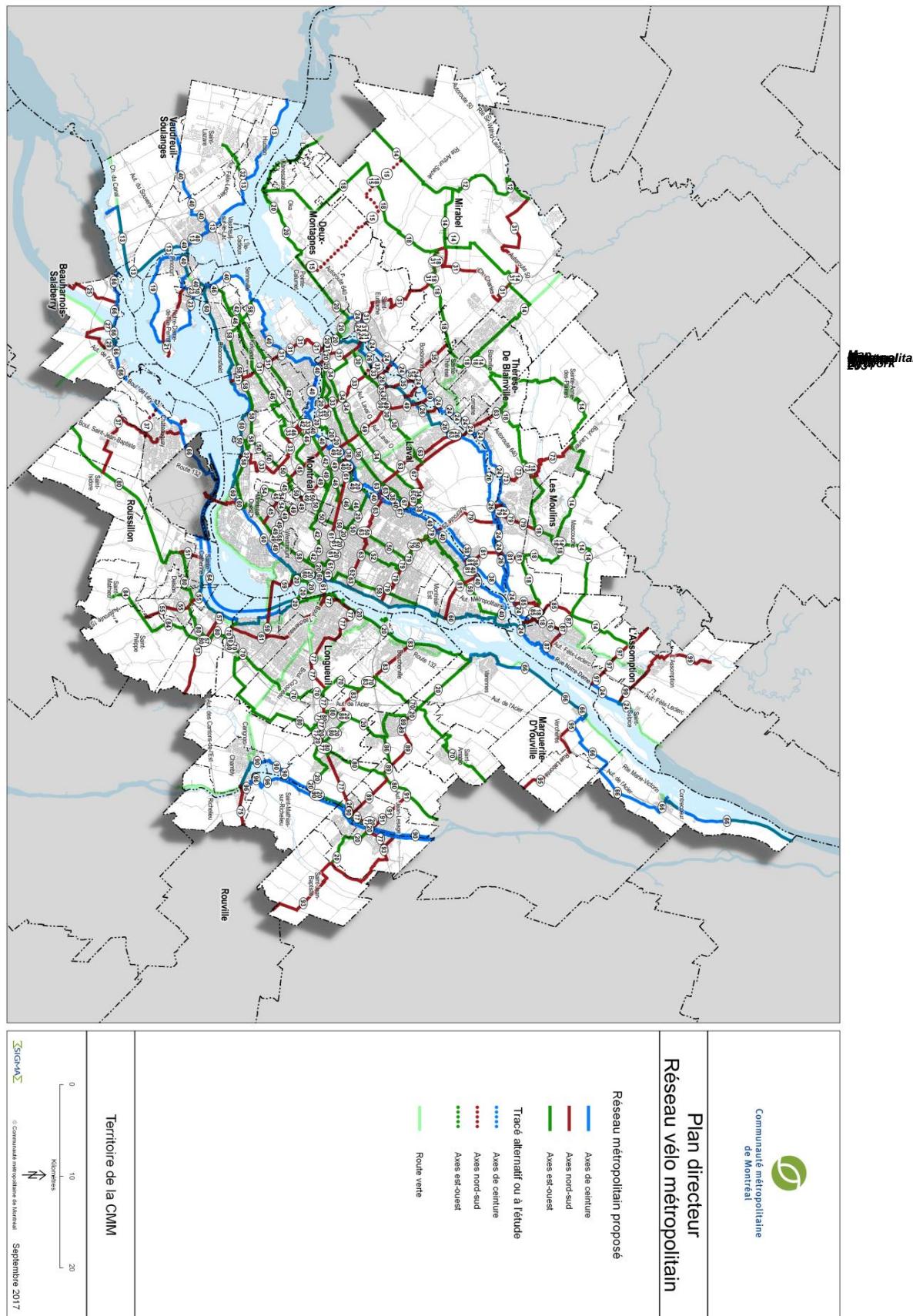
The metropolitan bicycle network **totals 1,725 km of cycle paths** and is divided into **71 axes metropolitan routes**, offering a multitude of routes depending on origins and destinations. The reader will find in the appendix detailed descriptive sheets of these metropolitan axes, each having been characterized according to:

- the municipalities crossed;
- TOD type neighborhoods served;
- employment centers;
- the heritage complexes and metropolitan facilities served; • the anthropogenic barriers and natural obstacles identified; • the nearby metropolitan forests and corridors as well as the recreational and tourist hubs;
- observed connections with the existing public transport network;
- connections with the Green Route and shuttles.

Map 4 shows the Greater Montreal Metropolitan Bike Network as it could be deployed across the metropolitan area by 2031. Like the upper road network, the bike paths of the Metropolitan Bike Network have been grouped according to their east/west or north/south orientation for numbering purposes. Some bike paths are also primarily intended to run along the banks of the river or certain waterways in the region and have been identified as such.

Components of the Metropolitan Bicycle Network





The proposed cycle facilities

A first axis of the Metropolitan Bike Network, the Cycling and Pedestrian Trail between Oka and Mont-Saint-Hilaire, was inaugurated on September 2, 2017. To complete the Network or to upgrade existing facilities, a summary definition of the work required for the other 70 axes of the Metropolitan Bike Network was carried out. In total, of the 1,580 km of cycle paths in the network:

- **390 km (25%) are existing local cycle paths** that are identified as part of the Metropolitan Cycle Network;
- **235 km (15%) are currently existing local cycle routes requiring upgrading of facilities** to bring them into line with existing standards; and,
- **955 km (60%) are new cycle sections to be built** in order to complete the network, in particular to enable the crossing of natural or man-made obstacles.

The proposed interventions consist of typical developments according to the characteristics of the environments crossed. They include:

- **cycle lanes on designated roadways**, on streets with low traffic volumes;
- **cycle lanes on asphalt shoulders**, improving the safety of cyclists along cycle routes;
- **separate cycle lanes (strips or tracks) on streets** with heavier traffic;
- **dedicated cycle paths and multi-purpose trails**, offering a good level of comfort and safety.

The proposed arrangements are inspired by the standards of the Ministry of Transport, Sustainable Mobility and Electrification of Transport in order to guarantee the comfort and safety of cyclists.

The proposed developments in the descriptive sheets in the annex are for budgetary estimation purposes as part of a planning exercise. A more comprehensive analysis will need to be carried out by the agencies to take into account traffic flows and speed limits, for example when developing more detailed design plans, before the cycle developments are carried out.

In agricultural areas, the proposed routes favor existing roads and cycle paths and avoid sensitive environments and flood zones. In some cases, the use of hydroelectric rights-of-way or disused railway lines is also proposed to minimize impacts on undeveloped environments.

Marking and destination signage will provide relevant information to users in addition to giving the network a distinct metropolitan signature.

5

IMPLEMENTATION

The Community intends to contribute to the implementation of the Bicycle Network Master Plan metropolitan in partnership with the government of Quebec, the municipalities of the Greater Montreal territory, the Metropolitan Regional Transport Authority (ARTM) and public public transport organizations (OPTC), as well as sustainable mobility partners, including Vélo Québec.

Cost of implementing the Metropolitan Bicycle Network

For the purposes of planning the work, a segmentation of each of the axes was defined, ensuring the homogeneity of each of the segments. A segmentation was also made at the municipal limits, also allowing the presentation of data by municipality. The reader will find in the appendix the detailed descriptive sheets of the proposed interventions on the metropolitan axes. These sheets will serve as a reference for the partners and during the implementation

of the Metropolitan Bicycle Network. Each of the files identifies:

- the municipalities crossed;
- the characteristics of the road right-of-way used;
- existing cycle facilities, if applicable;
- the required interventions, if applicable;
- cost estimate, if applicable.

The construction costs of new developments and upgrades to existing developments were estimated for each of the axes and segments of the Metropolitan Bicycle Network by multiplying the length of the segment by the typical cost (cost per linear meter) of the proposed development. A contingency provision is included in the cost of the work as well as a provision for the production of plans and specifications and the installation of signage.

The estimate is limited to the work required to meet the general criteria of accessibility, continuity and connectivity, and does not take into account the complexities of the terrain that will need to be assessed in more detail by the agencies. Consequently, the cost estimate does not include all the required studies, whether geotechnical, environmental

or related to flood or agricultural areas, contaminated soils or biological inventories, for example.

In total, the funding required to set up the Metropolitan Bicycle Network, the management of whose rights-of-way is the responsibility of the municipalities, is estimated at **\$700 million**, or:

- **\$50 million** for the upgrading of existing cycle paths; and,
- **\$650 million** for the development of new cycle paths.

Development of the Green and Blue Network of Greater Montreal

For the construction of the axes of the Metropolitan Bicycle Network whose main purpose is access to and development of the Green and Blue Network, the Community wishes to implement, starting in 2018, in collaboration with the Government of Quebec, a program that will allow, in particular, the financing of these interventions. The Community has already sent a request to this effect to the Government of Quebec (resolution CE16-221).

It is proposed that an envelope of \$40 million be set aside for the purposes of this program by the government and the Community, which will allow total investments over 5 years of \$60 million, including the contribution of the municipalities. The program will allow the sum of \$12 million to be invested per year to ensure the development of the Green and Blue Network of Greater Montreal by the Metropolitan Bike Network.

Once the amounts have been set and the terms of the program have been adopted, the municipalities of the CMM will be invited to submit their funding applications. A call for projects will be launched annually to determine a list of projects to be carried out as a priority. The selection criteria will first aim to prioritize projects with the longest mileage as well as those that will promote the connection of existing cycle paths identified in the master plan of the Metropolitan Bicycle Network.

The areas targeted by this component are identified on map 5. The total implementation cost is estimated at **\$206 million**.

In addition to the Metropolitan Bicycle Network, the Community wishes to develop the current river shuttle network, on the one hand, and new connections, on the other hand. A concept for the development of river shuttles is presented in the appendix to this document. This proposal is also intended as a tool for reflection intended for municipalities, operators, and even public transport operators, for the development of new river shuttle circuits. The areas identified have not been the subject of bathymetric analyses or analyses of feasibility.

A component aimed at implementing signage and destination signs on the Metropolitan Bicycle Network will be part of the program.

Measures ensuring intermodality and complementarity of cycling with public transport

The Metropolitan Bike Network identifies several utility routes, overlapping major public transport routes, towards the main employment and activity hubs, which generate significant travel. The establishment of the Metropolitan Bike Network will therefore provide an attractive alternative to motorized travel.

It is proposed that the Metropolitan Regional Transport Authority include, in its future strategic plan for the development of public transport, the following objectives, as well as the necessary funding, by 2031:

- to triple the number of bicycle parking spaces at intermodal and metro stations, commuter train stations and bus terminals, from 6,000 to 18,000 parking spaces, and to provide, where possible,
the installation of bicycle racks protected from theft and bad weather;
- to increase the number of bicycle racks on the buses of the four organizations
public transport;
- to create **655 km** of cycle paths for utility purposes.

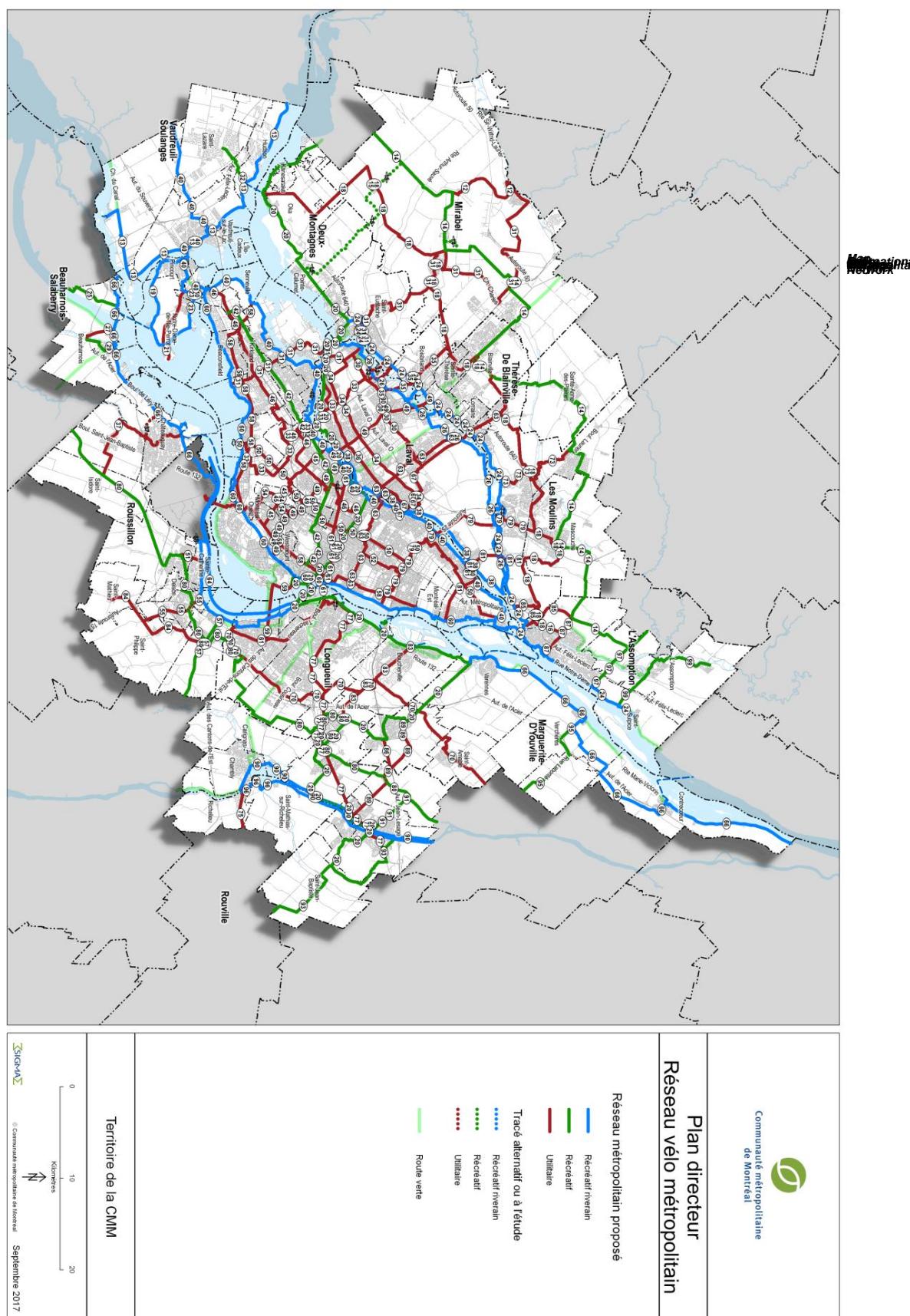
The development of bicycle parking at intermodal stations and metro stations, suburban train stations and bus terminals and the installation of bicycle racks on the
The bus will be funded by the Metropolitan Regional Transport Authority and government assistance programs for public transport (SOFIL and PAGTCP).

It is also proposed that the Community agree with the Regional Metropolitan Transport Authority on an investment program for the creation of cycle routes serving major activity generators. The routes targeted by this component are identified on Map 5. The total cost of implementing the municipal management utility routes is estimated **at \$495 million**.

Development of axes on the MTMDET network

The Ministère des Transports, de la Mobilité durable et de l'Électrification des transports is a key player in the implementation of the Réseau vélo métropolitain master plan. The Community wishes to establish close collaboration with the MTMDET to optimize each party's efforts in a context of shared responsibilities. It is proposed that the MTMDET support the creation of cycling facilities on bridges and road rights-of-way under its responsibility. The creation of the proposed cycling facilities on bridges belonging to the MTDMET could be considered when planning major repair work, as was the case with the Le Gardeur Bridge footbridge, which was built in its current state a few years ago, when it was being repaired. Similar examples include the Jacques-Cartier Bridge, whose approach from the Longueuil side was completed in spring 2011, and the Highway 25 bridge.

The axes targeted by this component are identified on map 5. The total implementation cost is estimated **at \$311 million**, including \$9 million for upgrading or creating a section of the Route verte.



Active mobility plans

The Metropolitan Bike Network axes serve the 155 TOD areas planned in the PMAD, without necessarily providing direct access to the public transportation facilities located in the center of these areas. It is proposed that municipalities complete the Metropolitan Bike Network by developing cycle paths and traffic calming elements to serve

the heart of TOD areas and promote active mobility and intermodality with transport collectives.

To complement the ongoing planning, the Community will partner with the Government of Quebec to provide the 14 MRCs and agglomerations of Greater Montreal with financial support to develop a regional active mobility plan. The active mobility plans will aim in particular to prioritize planned interventions at the MRC level, promoting the development of pedestrian and cycling links that provide more direct and rapid access to public transit access points and traffic calming measures.

Monitoring the Plan

To ensure the proper development of the Metropolitan Bike Network deployment, it is important to regularly measure the impact of the plan (rate of use of bike parking, modal shift towards active modes, number of kilometers of bike paths built, safe intersections, user surveys, etc.).

It is proposed that monitoring of the master plan be carried out by the Community, in collaboration with the various active mobility partners. At a frequency to be agreed,

The Community will conduct a survey to document, using various indicators, the evolution of cycling and the state of the cycling network in Greater Montreal.

It is also proposed that the Community, in collaboration with the municipalities, develop tools to promote Greater Montreal as a recreational bicycle tourism destination, as well as information and communication tools promoting the use of bicycles and their combination with other modes of transportation.

SOME KEY FIGURES

1.8% Modal share of cycling in Greater Montreal for home-work travel

(2011)

2.4% Modal share of bicycles for home-work trips in the region of

Portland, currently ranked first among so-called "cyclable" metropolitan areas (2011)

3.8% Target set for the modal share of cycling for home-work travel in

Greater Montreal by 2031

2,200 Number of kilometers of cycle paths in Greater Montreal (year after year, this network is expanding) (2013)

360

Number of kilometers of the Green Route that cross the territory of the Grand Montreal (2013)

2/3

Proportion of housing in Greater Montreal located 300 m or less from a cycle path (2013)

39% Proportion of cyclists who cite work as the reason for travel

(2013)

2,0

Male-female ratio among cyclists in Greater Montreal (2013)

85% Proportion of cyclists aged 15 to 59 (2013)

75% All bicycle journeys not exceeding 5 km (2013)

Source: Origin-Destination Survey 2013; Statistics Canada, NHS 2011; US Census, American Community Survey, 2011; CMM, data from cycling networks in Greater Montreal in 2013.