



Société du Havre de Montréal

Transformation of the Bonaventure Expressway at the Downtown Gateway

From Saint-Jacques Street to Brennan Street

S u m m a r y o f t h e p r o j e c t f e a s i b i l i t y s t u d i e s





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Summary of the project feasibility studies – April 2007



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Message from the Chair of the Board of Directors

The transformation of the Bonaventure Expressway is an exceptional opportunity for Montreal, not only to create a prestigious environment, but also to launch a project that truly meets the criterion of "sustainable development". In transforming the Bonaventure Expressway, between Saint-Jacques and Brennan streets, into a large urban arterial boulevard, this project will launch the reunification, on a human scale, of the downtown area with its river. Pursuing the development of the *Cité Multimédia* and the *Quartier international de Montréal*, in a green environment that integrates public transportation, this project will respect and absorb the unique qualities of the neighbourhood.

This project is also different from the great majority of similar infrastructure rebuilding projects, in that it is not motivated strictly by traffic considerations, but rather from a determination to pursue integrated development focused on the quality of its urban planning, financial viability and a respect for the environment.

The unified commitment of the various actors associated with the project, moreover, permitted the creation of a consensus at a level that has not been seen in Montreal for many years. And now, in the light of the detailed feasibility analyses, it is possible for decision-makers to make enlightened and responsible choices in regard to the execution of this first phase.

From Vision to Action

The studies of opportunity, prefeasibility and feasibility carried out since 2003 have allowed the generation of the necessary and indispensable information required to design the most "structuring" project possible to transform the Bonaventure Expressway at the downtown gateway.

In order to ensure the most exacting and rigorous project management, two more phases must be carried out before the start up of the project. First, the pre-project phase 2007-2008 will, in particular, allow the conduct of risk analysis on construction costs, the continued use of the expressway during construction and demolition, as well as planning traffic management over the construction period and the full range of measures to optimize public transportation in the Bonaventure corridor.

Then, in 2009, the phase of detailed plans and estimates will follow – the last one before the physical execution of the project – producing the final project construction cost estimate and the proposed detailed plans, including in particular, building the links with the existing expressway structure, the underground infrastructure, rebuilding the public roadways and sidewalks as well as the development

of the public spaces. It is at the end of these last two study phases that the execution of the project can start in 2009, finishing three years later.

Providing true development leverage to attract the private investment that will support the urban regeneration of the whole of the area, this project is one of the largest that Montreal has known for many years. In that regard, the presence of the mayor of Montreal on the Board of Directors of the Société du Havre, the fact that the government of Québec has emphasized that the revitalisation of Montreal's harbourfront is clearly one of its priorities and the evident cooperation and interest of the Canadian government for this project, demonstrates that it has the necessary support to radically change, in the most remarkable way, the setting of Montreal's gateway.

Therefore, in the light of the studies carried out so far – that draw conclusions not only in regard to its viability, but also about its significant development leverage – and of the consensus amongst the main leaders and elected officials in regard to the project, one can well affirm that all the necessary elements to carry out this project are now in place.

In this context, the transformation of the Bonaventure Expressway is clearly the decisive phase in launching the process of "reclaiming" the harbourfront by and for Montrealers. It is through its execution that a strong momentum can be created, allowing the completion, on time, of the regeneration of the whole of the harbourfront.

It is, undeniably, an ambitious project, but above all, it is an unequalled opportunity for Montreal to stimulate its full, healthy development. As well, the responsibility is now ours to unite our efforts in order to give Montreal a prestigious gateway and to set the pace for the implementation of the many projects that make up *Vision 2025*.



Isabelle Hudon

Chair, the Board of Directors
Société du Havre de Montréal

Société du Havre de Montréal Board of Directors, 2006-2007



Chair of the board

Isabelle Hudon
President and CEO
Board of Trade of Metropolitan Montreal



Gérald Tremblay
Mayor
City of Montreal



Charles-Mathieu Brunelle
Senior Vice-President and General Manager
of TOHU, la Cité des arts du cirque



Jacques Coté
President and CEO
Société du Havre de Montréal

Thanks

The SHM wishes to express its most sincere thanks to all those who contributed to the various aspects of the Bonaventure Expressway transformation feasibility studies, and in particular, those who participated in the management committees and steering groups, partner meetings, or the technical information exchanges. This report reflects the contribution of all those who responded to our invitation to advise on the future of Montreal's main gateway, the Bonaventure Expressway.

Foreword

A Project Committed to Sustainable Development

The project to transform the Bonaventure Expressway into a prestigious city gateway is solidly situated within a vision of sustainable development, and this in more ways than one. The project indeed seeks to respect the social, environmental as well as economic perspectives that large development projects now require. Certain elements such as the optimisation of public transportation and the promotion of active transportation, as well as an effort to minimise impact on the ecology during infrastructure building, will serve to guide the project throughout the planning and execution of its work.

The Société du Havre deliberately chose to only implement high-quality projects that would not only create a prestigious gateway into Montreal, but also encourage investment in this new link between the Saint Lawrence and the downtown area, and that would provide leverage for the development of the riverside neighbourhoods.

Planning Principles

Five principles guide the SHM planning process.

1. Contribution of the project to recognized common objectives

- Improve the quality of life;
- Create wealth.

2. Economic and social benefits of the project

- Provide economic benefits for the neighbourhoods adjacent to the project;
- Contribute to social development, participation of the area's residents in the economic activity generated by the project.

3. Contribution of the project to sustainable development

- Integrate and optimise public transportation;
- Consider environmental factors;
- Seek characteristics of example, quality and longevity;
- Build to last, to respond to current and future needs.

4. Urban benefits of the project

- Contribute to the reclamation of the area and give "identity value";
- Improve the quality of public spaces;
- Support the positioning of Montreal as an international centre of culture and design;
- Enhance the heritage aspects.

5. High quality of project development process

- Mobilize actors, locally (riverside) as well as city-wide;
- Ensure quality of access to information.

View of city gateway
from Cereal Foods
Canada silo



The Société du Havre de Montréal (SHM)

The Société du Havre de Montréal (SHM) was created in October 2002, in response to the recommendations of the Montreal Summit, initiated by the municipal administration. The participants at this summit had, in effect, identified the harbourfront as an area deserving of very special attention because of its unique development potential, in both urban and economic terms. The challenge of the SHM was to harmonize public and private interests in support of an action plan, that would mobilize support, inspired by an integrated vision of the area that would enable the various actors to envisage a coherent overall development plan.

The Montréal Harbourfront – Assessment of the Situation

As its first task, the SHM carried out an assessment of the situation, identified the development issues and proposed possible solutions, with the participation of partners and a consultative process representing the economic and university milieus, local residents, community groups and small businesses in the area, as well as interest groups reflecting heritage, environmental and cultural concerns. The main conclusions of this process are documented in a 200-page report.

The Montréal Harbourfront – Vision 2025

In the Spring of 2004, the SHM presented its vision of the development of the harbourfront. Its objective was to "reunite the city with its river". To re-establish this natural link, it proposed a set of initiatives that would give Montrealers the opportunity to fully use the exceptional location of their city, lining the riverside. The transportation infrastructure, that invades the river banks, and the network of expressways, that destroys the urban tissue, should give way to a reclamation of the riverside and urban space, while pursuing a perspective of sustainable development

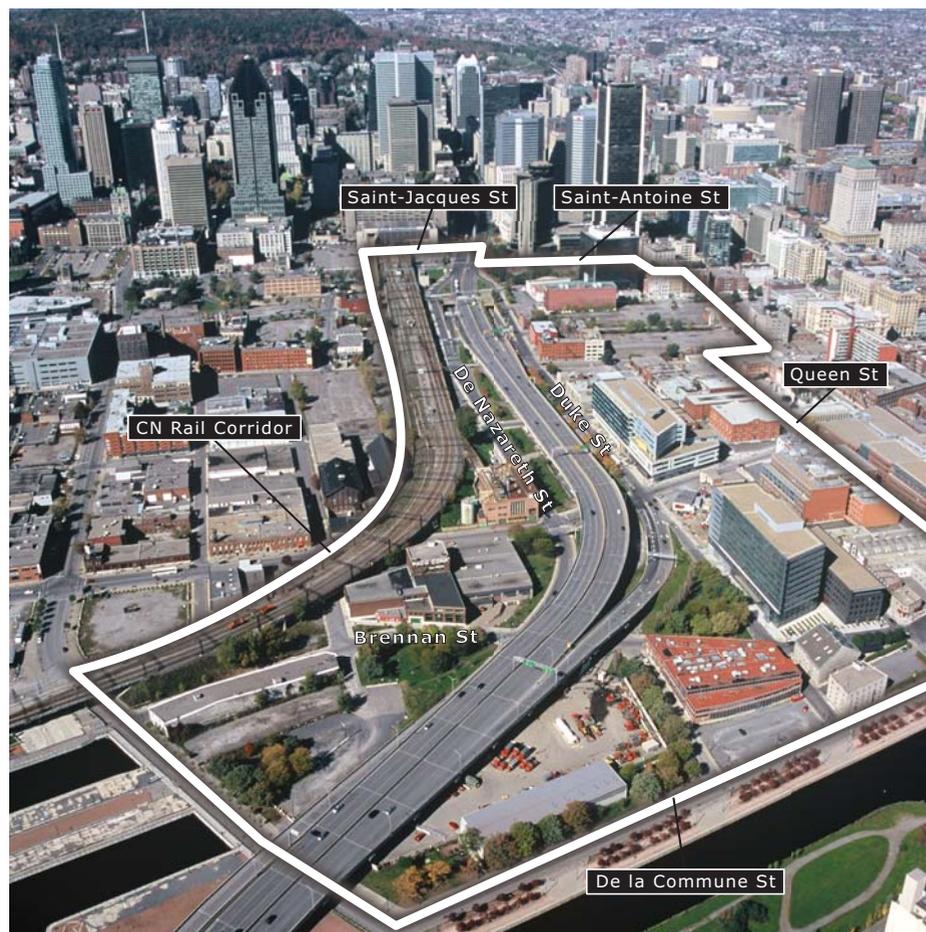
Feasibility studies

For this reason, much of the SHM's efforts over the past months have been devoted to advancing the state of knowledge of the transformation of the Bonaventure Expressway at the downtown gateway, to the point that it is now possible to take an enlightened decision in regard to its execution. This document therefore presents a summary of the feasibility studies commissioned by the SHM to transform the Bonaventure Expressway at the downtown gateway, between Brennan and Saint-Jacques streets. It is in three parts :

- Part 1 presents the highlights of the urban analysis and proposes a concept of enhancement, illustrating the future plans of the Bonaventure Expressway transformation project at the downtown gateway. This part also includes the validation of the construction costs;
- Part 2 presents the evaluation of the feasibility of real estate development on the three city blocks, owned by the City of Montreal, situated under the elevated structure of the Bonaventure Expressway that will be freed up in the first phase of transformation: it presents, as well, the economic and tax benefits of the Bonaventure Expressway transformation project at the downtown gateway;
- Part 3 consolidates the summaries of the technical feasibility studies and presents the results of the supporting studies on aspects of transportation, traffic and the environment so as to optimize certain of the results obtained in the prefeasibility study tabled in 2005.

Final report and recommendations

The SHM, in April 2006, submitted its final report to its partners. This report included 31 recommendations focused on the execution of *Vision 2025*, ranging from the implementation of a harbourfront tramway system to the provision of a riverside linear park between the Victoria and Champlain bridges. It was, however, very evident that the transformation of the Bonaventure Expressway, particularly – in a first phase – the section to the north of Peel Basin, would be the key to the implementation of *Vision 2025*.



View of Bonaventure Expressway, towards downtown, 2006

Project area "secteur d'intervention" – Transformation of the Bonaventure Expressway at the Downtown Gateway

The project area, defined as the "secteur d'intervention", covers approximately 30 hectares. It is bordered by the CN rail viaduct to the west, Saint-Jacques and Saint-Antoine streets to the north, Queen, Saint-Henri and Gauvin streets to the east and De la Commune Street to the south. The lots under the elevated structure of the Bonaventure Expressway, between Duke and De Nazareth streets, belong to the City of Montreal.

Planning Process History

This section enumerates the analytical and study phases that took place since 2003, in order to complete this ambitious project to transform the main Montreal gateway into an inhabited and vibrant neighbourhood.

2003-2004: Opportunity phase

In 2003, the City of Montreal's "bridges and tunnels" division had already started a study of the repair or refurbishing of that part of the Bonaventure Expressway that was within its jurisdiction, north of the Peel Basin.

In the spring of 2003, in its first efforts to develop a vision for the future of the harbourfront, the SHM set up a technical Committee for the Bonaventure corridor, bringing together representatives of the three levels of government. The committee's mandate was to evaluate, in a very preliminary way, the feasibility and the technical implications of a transformation of the Bonaventure Expressway into an urban arterial boulevard, from the Champlain Bridge to Notre-Dame Street. Its members were asked, in particular, to:

- do a preliminary analysis of the impact on the downtown traffic network of five new intersections in the Bonaventure corridor;
- identify a relocation scenario for the Bonaventure Expressway;
- develop different scenarios for crossing the Peel Basin;
- identify the required decision-making studies.

This is why, on the initiative of the SHM and Transport Canada, in cooperation with the City of Montreal and the *Québec ministère des Transports*, the Jacques Cartier and Champlain Bridges Incorporated, (JCCBI) agreed to sponsor a prefeasibility study of the Bonaventure Expressway transformation project between Champlain Bridge and Notre-Dame Street.

In the autumn of 2004, the SHM set up a management committee for the Bonaventure Expressway, charged with ensuring the follow-up of the prefeasibility study. This committee was made up of representatives of the following organizations : Société du Havre de Montréal, Transport Canada, Canada Economic Development for Quebec Regions, *ministère des Transports du Québec*, City of Montreal, *Société d'habitation et de développement de Montréal*, and the Ville-Marie and Sud-Ouest boroughs.

2005: Prefeasibility phase

It was clear, following preliminary analyses, that the transformation of this large urban infrastructure was a significant financial challenge, particularly in the light of the budgetary constraints of its public partners. This study aimed at documenting the technical issues associated with the expressway transformation project, to paint a picture of the implementation problems, to estimate the direct costs of such a project and to provide the appropriate decision-making authorities with the necessary information for enlightened decision-making on the future of the Bonaventure Expressway.

In February 2005, following a request for proposals, the SHM awarded the firm SNC-Lavalin the mandate to conduct a prefeasibility study of the project to relocate and transform the Bonaventure Expressway between the Champlain bridge and Notre-Dame Street.

A few weeks later, in April 2005, following a request for proposals, the SHM awarded the firm Genivar the mandate to carry out a study of the economic benefits of transforming the Bonaventure Expressway between the Champlain Bridge and Notre-Dame Street. This study measures both the structuring and the multiplier effects of the project, by looking at the real estate market's overall trends, development potential in the area and the "creation of wealth" that would flow from infrastructure investment.

Finally in October 2005, the principal conclusions of these prefeasibility studies were presented in the document "*L'autoroute Bonaventure Vision 2025 – Synthèse des études du projet de réaménagement*". In particular, it concluded that the cost of the transformation would be self-financed by the economic benefits flowing from the real estate development that it would generate.

Major conclusions of studies done in the prefeasibility phase (2005)

- The implementation of the first phase envisages the dismantling of the elevated expressway structure, as well as building a link to the existing expressway from de la Commune to Brennan streets. The estimated costs of demolition, dismantling, rebuilding and refurbishing this section, which allows the expansion of the downtown area towards the Peel Basin, was estimated at **\$90 million** (in 2005 dollars, including tax). Moreover, this excludes rebuilding the underground infrastructure, such as sewage and water supply systems, but also the gas mains, and similar conduits for electrical cables, telephones, etc
- Phase 1 also reflects a considerable advantage. It would make it possible for the City of Montreal to avoid the costs of major repair of this section, as required should the status quo be maintained. A study by the firm Roche estimated that the status quo option would require investments of more than **\$60 million** (in 2003 dollars) in order to prolong the service life of this infrastructure over the next 35 years.
- The transformation of this section, situated north of Brennan Street, will free up large areas for real estate development. This potential would generate real estate investments of more than **\$800 million** (in 2005 dollars) and economic benefits in the whole of the study area, allowing the three levels of government to justify their investment in terms of the revenues generated by the construction as well as the subsequent recurring revenues.

2006-2007: Feasibility phase

In June 2006, the three levels of government ratified the SHM work plan, *Plan de travail 2006-2007*, that focused, in particular, on the study of the Bonaventure Expressway transformation project. For this reason, the SHM, in close cooperation with Transport Canada, the *ministère des Transports du Québec*, the City of Montreal and the *Société d'habitation et de développement de Montréal* mandated teams of professionals to:

- confirm the feasibility of real estate development and the economic and tax benefits generated by the land owned by the City of Montreal;
- propose an enhancement concept, illustrating future initiatives;
- carry out a supporting study on transportation and traffic in order to optimize some of the results of the prefeasibility study.
- optimize the efficiency of public bus transportation between the downtown terminus and the Bonaventure Expressway;
- carry out environmental studies on soil characterization, air quality, noise and vibration intensity as well as a schedule of environmental approvals necessary to implement the Bonaventure Expressway transformation project.

Part 1: Development Concept

The elements of success from a development perspective

- The project's unified setting and opulent foliage provide a majestic and prestigious gateway to the city, allowing the completion of the area's revitalisation, started by the *Cité Multimédia* and the QIM (*Quartier international de Montréal*).
- The project transforms the main Montreal gateway into an inhabited and vibrant district, extending the downtown area;
- With the presence of two adjacent Métro stations, a network of surface-level and protected pedestrian walkways, the proximity of Central Station, the development of the harbourfront tramway project as well as the possible subsequent introduction of the SLR A-10/Downtown, the transformation of the Bonaventure Expressway supports public transportation and active transportation as the means of access to the area;
- Because of their configuration, the central city blocks, separating the traffic lanes, allow flexibility and can easily accommodate residential, hotel and office use;
- The Wellington Street threshold sends a message of more cohesive pedestrian and vehicular cohabitation, encouraging drivers to reduce speed. The gateway reflects the look and vitality of the downtown area;
- The transformation of this section minimizes the visual impact of the connecting expressway roads, both in regard to the Ville-Marie Expressway as well as to the more expressway-like Bonaventure link;
- In the context of the overall project, a riverside green belt will allow the continuity of the recreational networks extending from the Verdun borough, Jean-Drapeau Park, the Lachine Canal and the Old Port, thus ensuring pedestrian and bicycle links with the first phase of the project, currently under study.



Introduction

As the 21st century begins, the area of the Bonaventure Expressway and the spaces that surround it will play an important role in the economic and urban development of Montreal. These spaces offer great potential for enhancement, which it will be important to pursue in a context of sustainable development. The relatively recent reclamation of this part of the harbourfront injected a new breath of life into Montreal. Note, for example, the revitalization of the west of Old Montreal, the reopening of the Lachine Canal, the redevelopment of McGill Street, the emergence of the *Cité Multimédia* and QIM and the enlargement of the *Palais des Congrès*, which contributed to the revival of this sector of the downtown area. The Bonaventure Expressway transformation project, at the downtown gateway, is thus fully coherent with the efforts carried out to date to improve this part of the downtown area.

The current shape of the Bonaventure Expressway, with its elevated section, creates a multitude of Brownfield zones on both sides of its right-of-way as far as Notre-Dame Street. A first step was taken with the construction of two buildings, in the *Cité Multimédia*, with frontages on the expressway and then, further north, by the redevelopment of University Street as part of the QIM.

The reopening of the Peel Basin combined with the vitality of centres of employment such as the *Cité Multimédia* and the QIM, the downtown gateway will become a living area sought by Montrealers. They will choose to live in the *faubourg des Récollets* and Griffintown, close to their work. This formerly run-down area will take on an urban character, generating a multitude of pedestrians, cyclists and vehicles. Six bus routes already criss-cross the area. These conditions raise the issue of

the safety and comfort of pedestrians as well as the users of public transportation.

In implementing its work plan, the SHM commissioned an urban development study for the first phase of the transformation of the Bonaventure Expressway, between Brennan and Saint-Jacques streets. The scenario selected by the SHM aims at creating the conditions of a large urban arterial boulevard, with lanes located on both sides of a string of central city blocks, available for future development. The transformation of this expressway section frees up land owned by the City of Montreal and complements the redevelopment of the adjacent districts (QIM, *Cité Multimédia* and Griffintown). This project thus transforms the main Montreal gateway into an inhabited and vibrant district, located in an extension of the downtown area.

In a first step, the development study mandate defined a concept that would allow the optimization of the economic benefits generated by the projects located on the central city blocks while also encouraging their use to that end. The formal proposals are thus coherent with the studies relating to the real estate market.

In its second step, the mandate provides the relevant decision-makers with the information necessary to make enlightened decisions for the future of the Bonaventure Expressway. This report shows the highlights of the urban analysis and clearly presents the enhancement concept by illustrating future plans.

Identification of the Main Development Issues

The following section raises the main issues and the conditions flowing from them. In this regard, note the SHM's objectives for the transformation of the part of the Bonaventure Expressway located between Brennan and Saint-Jacques Streets:

- design a prestigious gateway into the city and a clear link between the downtown area and the Peel Basin (the river);
- mend the urban fabric of the surrounding areas : *faubourg des Récollets* and Griffintown;
- reduce road congestion by giving priority to public transportation while maintaining traffic fluidity;
- improve the quality and security of surface and protected pedestrian movement, in close liaison with the public transportation networks;
- provide public places that are pleasant, safe and friendly for their users;
- facilitate vigorous real estate development linked to the downtown area

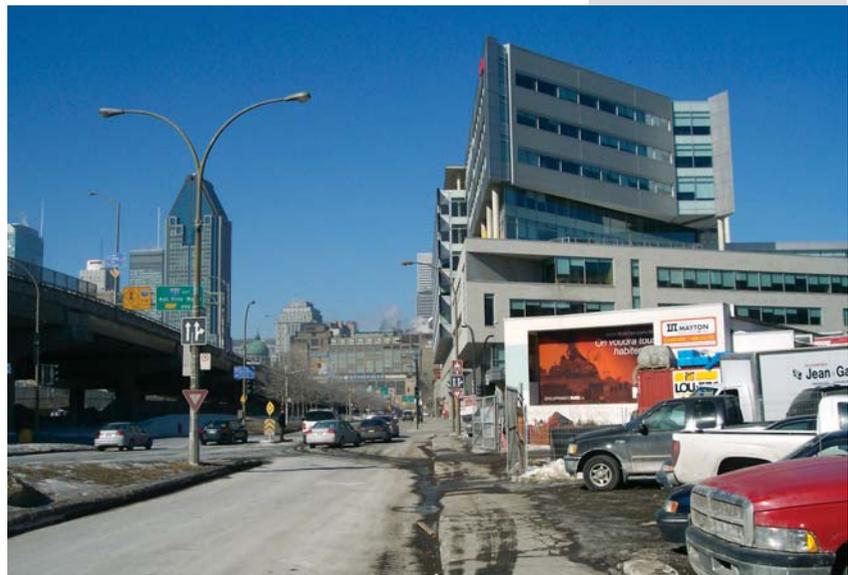
Prestigious city gateway

A city's gateway is defined by the quality of the public setting. The Wellington Street threshold gives early warning of a more convivial cohabitation of pedestrians and automobile traffic, encouraging reduced speed. Finally, the gateway itself reflects the look and vitality of the downtown area. The Bonaventure Expressway transformation project at the downtown gateway reflects the following challenges:

- provide a scale of public places that is proportional to the scale of the road infrastructure so as to balance the cohabitation of pedestrians and motorists;
- install refined street furniture and generous rows of trees to reinforce the prestigious look of the public roads;
- establish and apply rigorous criterion for the occupation, lay out and design of the buildings located in the central city blocks
- select prime contractors well known for the quality of their projects.

Current city gateway, Duke and Wellington streets intersection

University St in QIM (Quartier international de Montréal), north of project are



Groupe Cardinal Hardy



Jonathan Picard (QIM)

Plan of Bonaventure Expressway transformation

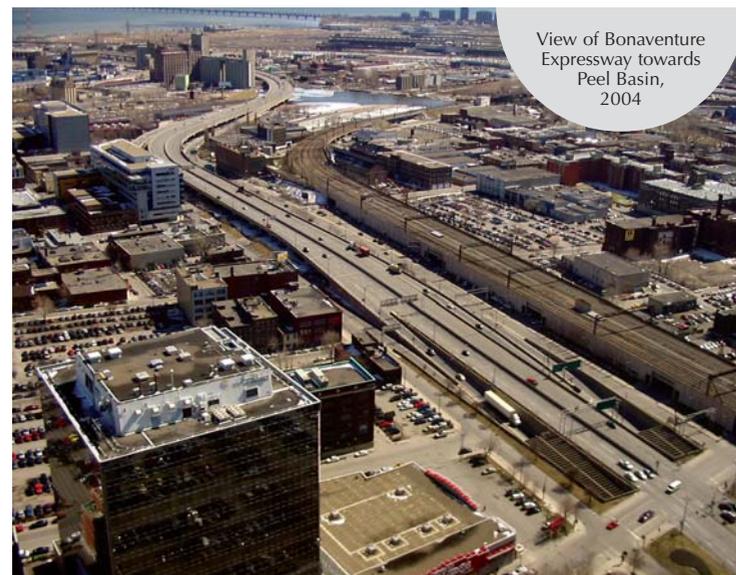


Groupe Cardinal Hardy

Urban fabric

In freeing up land suitable for building, the proposed development rediscovers the panorama provided by the historic urban fabric of the area, linking *faubourg des Récollets* to Griffintown. The removal of the barrier created by the existing road infrastructure and the urban regeneration of the freed-up spaces, extends the downtown area to the Peel Basin and to the river. To encourage mending the urban fabric, the project seeks to:

- separate the arrival route (Duke Street – going downtown) from the departure route (De Nazareth Street – towards Peel Basin and the river);
- provide a network of surface and underground pedestrian walkways that facilitate movement within the area and with neighbouring areas, in liaison with the public and active transportation networks;
- establish a hierarchy of east-west links: main cross streets (Wellington, Ottawa and William Streets) and pedestrian corridors (Saint-Maurice Street) and scenic corridors (Saint-Paul Street)
- improve the visual aspects of the area around the CN railway viaduct, along with development initiatives in Griffintown;



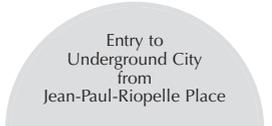
View of Bonaventure Expressway towards Peel Basin, 2004

- continue the urban reclamation of the *faubourg des Récollets*, integrating its most significant heritage elements into it.

Collective and active transportation

The objective of transforming the main Montreal gateway into an inhabited and vibrant neighbourhood and of slowing automobile traffic requires, in view of the vital role played by the Bonaventure corridor as a link with the South Shore, that particular attention be paid to both public and active transportation in the project area.

The transportation and traffic aspect is discussed in Part 3 of this report, but it should be noted, from an urban planning perspective, that it is essential to integrate into the project preferential measures for bus transportation from the South Shore, including a fifth dedicated lane on De Nazareth Street between William and Wellington Streets, or again a dedicated corridor between Wellington Street and the downtown terminus at 1000, De La Gauchetière (TCV), taking Ann and De l'Inspecteur streets west of the Canadian National rail corridor.



Entry to Underground City from Jean-Paul-Riopelle Place



Photo: Alain Laforest



Example of facilities for "active transportation", Cité Multimédia

The transformation project should also use its assets that are currently in place (e.g. two adjacent Métro stations, proximity of Central Station, several STM bus routes) or, on the "drawing board" (e.g. harbour-front tramway, South Shore SLR) in order to make public transportation the preferred means of access to the area, by people. The same can be said in regard to active transportation, by integrating a pedestrian path network, surface and protected, to the networks of the riverside areas (e.g. Montreal Underground).

In the overall Bonaventure Expressway transformation project, a riverside green belt will ensure the continuity of the recreational networks from the Verdun borough, parc Jean-Drapeau, the Lachine Canal and Old Montreal, thereby ensuring a linkage of pedestrian and bicycle paths with Phase 1 of the project, currently under study.

Thus, the configuration of the new urban arterial boulevard should provide an environment suitable for active transportation. The following measures should be undertaken:

- reinforce the urban characteristics of the roads, giving greater attention to their use by buses;

- install bus shelters and undertake other measures to improve the comfort and safety of public transportation users;
- provide wide sidewalks and safe crosswalks to facilitate pedestrian travel;
- provide what is required to facilitate active transportation (installation of bicycle racks, indoor bicycle parking, etc.).

Traffic and speed reduction measures

The mutation of an expressway into an urban arterial boulevard requires a series of measures, beyond simple traffic signs, that can be felt and seen by motorists.

In order to slow down and distribute the traffic, the following elements should be considered:

- line the road with a public domain that reflects conviviality, by providing wide sidewalks;
- redesign on a human scale the right-of-way of certain streets such as Saint-Maurice, by widening the sidewalks and planting trees so as to make the pedestrian walks more pleasant and helping to reduce the speed of traffic;
- identify safe pedestrian cross-walks;
- reduce vehicle speed by allowing parking in the street outside peak hours;
- encourage open design, transparency and commercial or government occupation of the ground floor of buildings so as to generate a more vibrant public domain
- structure the pedestrian environment with sufficiently dense rows of trees thereby reinforcing the demarcation between pedestrian space and vehicle space;
- increase the wellbeing of passers-by through the quality of street furniture, lighting and landscaping.

Enhancement Concept

The arrival of the Bonaventure Expressway at the downtown gateway, transformed into a wide arterial urban boulevard, is distinguished by its setting and its generous rows of trees. The redevelopment of the public domain unifies the section between Brennan and Saint-Jacques Streets. On reaching Wellington Street, a first threshold announces the new urban character of the Bonaventure. The second threshold, between Saint-Jacques and Notre-Dame streets, expresses the transition into University Street, gateway to the downtown area. The transformation of this section minimizes the visual impact of the connecting roads, whether they be the link to the Ville-Marie Expressway, or the connection to the more expressway-like Bonaventure. The new arterial urban boulevard consists of two wide avenues, one heading downtown (entry) and the other towards the river (exit).

The makeup of the new urban arterial boulevard is defined by three elements:

- the central city blocks that divide its north and south lanes;
- the Canadian National rail viaduct that leads to Central Station;
- the *faubourg des Récollets*: i.e. the buildings along Duke Street and the *faubourg*-style city blocks.

Development guidelines

The SHM *Vision 2025* proposes to unite the city with its river. For the Brennan – Saint-Jacques section, it emphasizes the rebuilding of the rundown areas around the Bonaventure Expressway. To this end, three overarching principles guide the development concept for the new urban arterial boulevard.

- target effectively the type of building that can be built on the central city blocks, based on the needs of the market;
- provide a prestigious city gateway characterised by its majestic appearance, flowing from the unity of its setting and the volume of its foliage;
- complete the downtown revitalisation started by the Cite Multimedia and QIM projects.

Central city blocks

The succession of central city blocks presents a line of parallel buildings. The two ends of this line, both to the north and the south, give way to landscaped "green" city blocks that signal thresholds between the arterial boulevard and the downtown area (north), or the arterial boulevard and the more expressway-like part of the Bonaventure (south). The wide sidewalks of the future arterial boulevard as well as the forecourts of the buildings are primarily designed as places that allow conviviality and socialization. The line of street furniture and the sidewalk greenery give a well groomed setting to the avenues on a scale appropriate to pedestrians.

The narrow profile of the central city blocks contributes to the development of more tall and slender architectural volumes. A "signature" architecture, elegant and original, is appropriate to this new urban section, thereby allowing a certain cohabitation with the Canadian National rail viaduct.

Because of their configuration, the buildings can easily be used for residential, hotel or office purposes. In the illustrated scenario, the first southern block (3C-18) is reserved for offices while the buildings on the two other central city blocks (3C-17 et 3-16b) are residential.

View of site for future central city blocks and surrounding area of Bonaventure Expressway



Disposition of proposed buildings at intersection of Ottawa, Duke and De Nazareth streets

Cross section of proposed buildings and rail viaduct at Ottawa St



Groupe Cardinal Hardy



Groupe Cardinal Hardy

Modelisation of De Nazareth St, south of Saint-Maurice St



Current view of rail viaduct at Notre-Dame St

Canadian National rail viaduct

Since the 1940s the Canadian National rail viaduct separates *faubourg des Récollets* from Griffintown. Currently, the line of large walls, without openings, surrounded by parking lots is the main characteristic of this feature. The transformation of the Bonaventure corridor into a large urban arterial boulevard proposes a new interface between the rail viaduct and De Nazareth Street. The commercial or public use of the viaduct is proposed in order to start the revitalisation of the surrounding city blocks to the east. Like the approaches to Queensboro Bridge in New York, this rail viaduct's volume can accommodate commercial spaces with high ceilings. The original openings could be reopened so as to increase the conviviality, transparency and the feeling of security of passers-by.

The success of the new transformation of the Bonaventure corridor into a large urban arterial boulevard depends notably on the enhancement of the rail viaduct that gives access to Central Station. A series of actions can be undertaken to favour its reclamation:

- remove the material from the original openings and beautify the façade;
- reclaim the internal space;
- bring together the policies of the Ville-Marie and Sud-Ouest boroughs so as to develop both sides of the viaduct.
- find occupants oriented towards the public domain.

View of commercial spaces under Queensboro Bridge, New York



Groupe Cardinal Hardy

Faubourg des Récollets frontage : built frontage and faubourg-style city blocks

The buildings lining Duke Street, mark the boundary of the *faubourg des Récollets*. Extending from the first buildings of the *Cité Multimédia*, the construction of a series of buildings completes the top of the city blocks of the *faubourg*. Certain blocks of Duke Street have existing quality buildings or typical architecture. They can be preserved if their physical condition allows it. Their cohabitation with the new buildings will continue the dynamic environment created in the *Cité Multimédia*. The buildings that make up this frontage have a commercial vocation, mainly on the ground floor while offices can be on the floors above.

The future configuration of the city blocks replicates the historical fabric of the area. The development of the city blocks lining the future arterial boulevard marks the passage between the two milieus. The industrial environment reflected in these neighbourhoods highlights the origins of the metropolis. The *faubourg*-style

Pedestrian walkway between King and Queen streets, *Cité Multimédia*



characteristics of the future urban arterial boulevard can be enhanced by contemporary architectural initiatives. It is not necessary to slavishly reproduce existing architecture but, rather, to respect it and interpret it. The public domain (streets and landscaped green spaces) have strong potential to show the area's character. This approach can reveal the evolution of the area and its glorious past. Thus, the visitor discovers a piece of Montreal's identity, while also benefiting from a convivial environment.

The new neighbourhood's structure is consolidated by a network of pedestrian walkways and public spaces, linked to the public transportation system. This network is part of the civic attraction of the area and helps distinguish between commercial and residential spaces. In this respect, the creation of a garden on the former site of the *Petit Séminaire's* courtyard reinforces this idea. Moreover, the proposal also suggests the reconfiguration of certain streets, like Saint-Maurice Street, by widening the sidewalks and lining it with trees, in order to make it more attractive to pedestrians. This rehabilitation also helps slow the automobile traffic, in a neighbourhood that is more and more inhabited.

Cross section of proposed buildings in area bounded by Saint-Maurice, Saint-Henri, William and Prince streets



The city blocks more to the north of the neighbourhood (3-P20, 3-P21 and 3-P22) are devoted to commercial and office functions, while the central blocks (3-P23 and 3-P25b) accommodate residential buildings not higher than 35 metres. The ground floor of the future buildings is reserved preferably for commercial functions (proximity services) putting to good use the floor-to-ceiling height of five metres. However, if certain buildings provide residential accommodation on the ground floor, this floor must be built at street level so as to allow parking space to be built into the basement.

Disposition of proposed buildings, north of Faubourg des Récollets



Groupe Cardinal Hardy

Groupe Cardinal Hardy

Structure of Landscaping, Accessibility and Networks

The two routes, "in" (Duke Street) and "out" (De Nazareth Street), make it possible to accommodate automobile traffic while facilitating a more safe environment for pedestrians. The width of the sidewalks is defined in order to balance pedestrian and vehicular space. Thus, the sidewalks reach a width of 8.2 metres including a double row of trees lining the edge of the pavement. The large arterial roads, on both sides of the central city blocks, are generally four lanes wide, to which are added in certain segments an auxiliary lane, to provide a dedicated lane for public transportation, and to facilitate turns.

The central city blocks, in the centre of the new arterial boulevard, facilitate street crossing by pedestrians and cyclists. It allows the tissue of the *faubourgs* to be mended, connecting Griffintown to the *Faubourg des Récollets*. The large arterial boulevard is punctuated by a series of intersections, facilitating the distribution of vehicular and pedestrian traffic within the surrounding neighbourhoods, along with the public transportation systems, particularly the Victoria Square and Bonaventure Metro stations. The double rows of trees lining the sidewalks, because of their size, help direct pedestrians towards the safe cross-walks. The trees are planted in continuous trenches and there is a line of shrubs between the tree trunks.

The large spreading trees give a solemn setting for future civic parades and motorcades. The line of planted trees is interrupted, from time to time, by inserted street furniture (bus shelters, refuse containers, bicycle racks, *colonnes Morris* (cylindrical billboards), parking metres, etc.).

Parking in the street is envisaged outside the peak periods. This measure provides additional protection between pedestrians and road traffic. Curb-side parking is also recognized as a means of slowing traffic, indicating the transition from expressway speed to the urban conditions of a future arterial boulevard.

In QIM, width of sidewalks facilitates pedestrian-automobile cohabitation



Jonathan Picard (QIM)



Modelisation of city gateway, towards Peel Basin, at intersection University and Notre-Dame streets

Groupe Cardinal Hardy

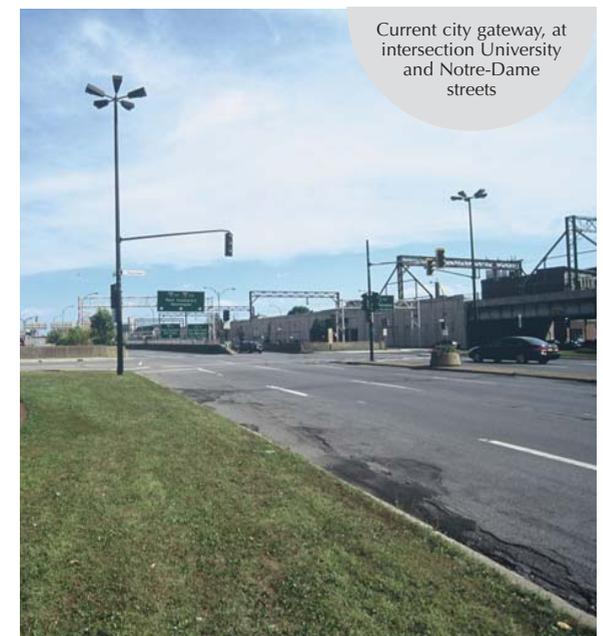
Access to Ville-Marie Expressway

Access to the Ville-Marie Expressway is obtained using the existing connecting roads on a central city block, between Saint-Paul and Notre-Dame streets. These will be refurbished during the dismantling of the expressway apron. Motorists will use new lanes, running parallel to the central city blocks, to enter or exit the Ville-Marie Expressway. This configuration makes it possible to reduce the length of the connecting roads and allows the installation of additional pedestrian crosswalks.

Disposition of enter and exit lanes for Ville-Marie Expressway, south of Notre-Dame Street



Groupe Cardinal Hardy



Current city gateway, at intersection University and Notre-Dame streets

Real Estate Development Potential

The lowering of the expressway contributes to urban renewal, freeing-up 17,370 m² of land for development. Moreover, the *faubourg des Récollets* provides 64,485 m² of available land. In addition, the CN rail viaduct has 20,495 m² of ground-level

space, part of which can be used for commercial or public purposes.

Thus, this total space provides a development potential of more than 415,000 m², close to the 430,000 m² envisaged in the Genivar study of economic benefits (October, 2005). The envisaged programming focuses especially on commercial (offices and hotel) and residential use.

The central city blocks, municipally owned, could accommodate in the order of 600 residential units, 5,000 m² of retail business space and 43,000 m² of office space. Under the central city blocks, 500 parking bays can be provided on two levels. A minimum ratio of 0.5 parking bays per unit of housing and one space per 350 m² of commercial surface is proposed. This standard represents the

minimal level accepted by the City of Montreal in regard to parking.

The table shows the development potential of this land according to the suggested uses.

	City Blocks	Land Area (m ²)	Floors	Total Floor Space (m ²)	Commercial Office	Retail	Residential Floor Space	Residential Units	Park Green Space	Parking minimum ⁽³⁾	Parking potential
CANADIAN NATIONAL RAIL VIADUCT	3-C7	650							650		
	3-C8	5,525		4,400 ⁽¹⁾					1,125		
	3-C9	2,585		2,335 ⁽¹⁾					250		
	3-C10	2,460		2,180 ⁽¹⁾					280		
	3-C11	870		750 ⁽¹⁾					120		
	3-P12	6,405	1	4,005		4,005			2,400		
	3-P13	2,000	8-15	10,000	8,000	2,000					
Subtotal		20,495		14,005	8,000	6,005			4,825		
CENTRAL CITY BLOCKS	3-C15	1,620							1,620		
	3-C16 a	3,100							3,100		
	3-C16 b	1,970	15	22,030		815	21,215	250		125	100
	3-C17	3,860	15	31,590		1,170	30,420	360		179	200
	3-C18	3,950	15	45,840	42,775	3,055				131	200
	3-C19	2,870							2,870		
Subtotal		17,370		99,460	42,775	5,040	51,635	610	7,590	435	500
FAUBOURG DES RÉCOLLETS	3-P20/3-P21	12,670	15	51,250	22,335		28,915	340		234	
	3-P22	13,000	3-15	46,150	33,845		12,315	145		169	
	3-P23/3-P24	14,035	3-15	66,950	32,575	2,325	32,025	375	450	281	
	3-P25a	4,445	5-10	10,900	10,920				912	31	
	3-P25b	9,150	3-10	34,275		1,375	32,900	390	2,747	194	
	3-P26	6,600	6-12	55,100	51,470	3,650				147	
	3-P27 ⁽²⁾	3,775	6-10	25,775	10,470	4,850	10,475	125		91	
	3-P28	810	6	11,325	6,475	800	4,045	50		42	
Subtotal		64,485		301,725	168,090	13,000	120,675	1,425	4,109	1,190	
TOTAL		102 360		415,190	218,865	24,045	172,310	2,035	16,530	1,625	

(1) These figures are not included in the total

(2) Development potential given by the promoters of the M9 project
The office and residential functions were distributed evenly, i.e. a ratio 50/50

(3) The calculation is based on 1 bay per 350 m² for offices and 0.5 bays per residential unit

Validation of Construction Costs

The SHM commissioned the firm Macogep inc. to validate the direct construction costs, estimated during the prefeasibility phase, of the Bonaventure Expressway transformation project.

The demolition of the expressway's elevated structure and the rebuilding of Duke and De Nazareth streets had been estimated by SNC-Lavalin, at that time, at \$90.5 million (in 2005 dollars, tax included). On the other hand, Macogep evaluates the cost of the same work at \$55.5 million (in 2009 dollars, tax included). This significant reduction is explained primarily by the fact that a more detailed analysis, based on the construction plans, as built, showed that the demolition volumes are much less than initially estimated.

This scenario envisages that demolition work would be carried out by three teams, working simultaneously on one 50 hours/week shift and that the duration of the construction would be 24 months, of which seven months would be devoted to the demolition itself. The demolition period could, however, be reduced to four months by adopting a work schedule of two shifts of 50 hours work/week. The sequence of work could proceed as follows:

- widening of the existing northerly exit ramp (Wellington exit) at the same time as the demolition of the structure between piers P10 et P15;
- construction of a new southerly access ramp, starting at Wellington Street;
- demolition of the structure between Wellington and Notre-Dame streets, at the same time as the partial demolition of the ground-level expressway and the construction of the boulevard (alongside the central city blocks), the work advancing in parallel, separated in time by a few days;
- redirection of traffic onto the newly built portion of the boulevard, demolition of the remaining ground-level expressway and construction of the expressway section thus freed-up.

Macogep inc. also analysed a second scenario that envisages the demolition of the existing northerly ramp and its replacement by a new ramp rather than the widening the existing one. This scenario gives more development flexibility, but generates an additional cost of \$31 million (tax included). Macogep therefore recommends opting for the original scenario, since it allows project costs to be minimized, notably in regard to construction and demolition costs of the expressway on/off ramps.

Cost of the status quo

Built during Expo 67, the Bonaventure Expressway has since suffered the wear and tear of time and traffic. Over the past years, city employees had to intervene on several occasions under its structure in order to carry out repairs. Faced with this situation, the City of Montreal must, over the next months, decide on whether to repair, rebuild or replace the existing structure. A recent study by the firm Roche determined that the Status Quo option, rather than the transformation of the Bonaventure Expressway, would require more than \$60 million (in 2003 dollars) to extend the its service life over the next 35 years.

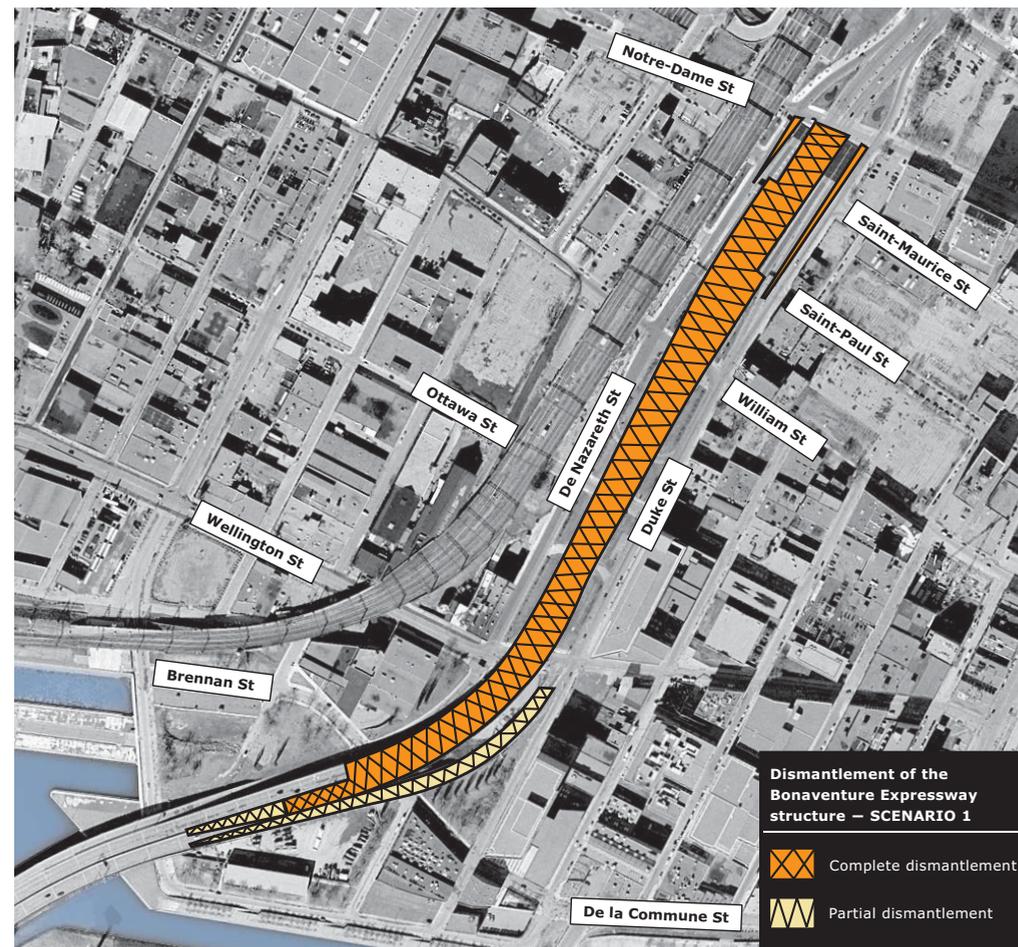
Recommendations

The consultants nevertheless suggest that the \$90 million (2005 dollars, tax included or \$79 million before tax) project construction budget be maintained, stating that the cost of certain project-related activities, that could not be included in the prefeasibility studies, have still not been inserted into the cost estimates. These activities include, in particular:

- improvement of the public domain to reflect the neighbourhood's status of city gateway, in a manner similar to the redevelopment of the QIM (\$13 million);
- provision of green spaces at the city's gateway (\$9 million);
- archaeological measures;
- soils management;
- relocate the snow chute.

It is also important to note that the replacement cost of urban infrastructure below the ground level, whose service life has been reached or exceeded and that must be replaced, according to the directorate responsible for the strategic management of the city's water supply system, is not included in the Macogep estimates.

It will be important during the pre-project to plan the integration of the reconstruction of the water and sewage systems as well as other underground infrastructure (gas, electricity, telephones, steam) into the construction schedule of the transformation of the Bonaventure Expressway at the downtown gateway. Furthermore, the City of Montreal should identify in the pre-project, the scope and cost of the necessary work and include them in its capital plan (*Programme triennal d'immobilisations*).



1. ROCHE, "Réfection ou réaménagement de l'autoroute Bonaventure - étude des scénarios de réfection/reconstruction ou du démantèlement", rapport d'étape, juin 2004.

Part 2: Real Estate Potential and Property Benefits

The elements of success from a real estate perspective

- The strategic location of the study area at the city's gateway and close to the QIM gives an upscale, prestigious image, as well as great visibility potential, to future corporate occupants;
- The 2010-2011 market will provide an interesting window for the delivery of residential projects that are well positioned and well targeted, particularly in the project area where competition will be non-existent;
- The eventual construction of more than 2,000 housing units will allow 3,500 new residents to be accommodated in the heart of Montréal;
- The creation of a "pole", or hub, will be a source of commercial attraction as well as interaction among clients of the various businesses;
- The areas around the Bonaventure Expressway stand out in regard to the growth of the hotel market that is twice as high as the downtown market;
- One or more hotel projects may well be initiated in the project area in the next five to ten years.
- The transformation of the Bonaventure Expressway will bring in its wake over \$800 million of real estate investments for all of the project area, attracting investors, both public and private, who will see interesting business opportunities. The breakdown is \$550 million in the *Faubourg des Récollets* and \$284 million on land belonging to the City of Montreal.

The elements of success for land belonging to the City of Montreal

- The revenue flowing from the sale of the three central city blocks belonging to the City of Montreal will be in the order of close to \$16 million.
- The potential real estate investment on the property belonging to the City of Montreal is \$284 million.
- The property and school taxes that would be generated, potentially, using 2007 rates, by the City of Montreal owned property, a taxable asset created specifically from the currently non taxable right-of-way, is \$7.65 million, annually.
- The tax benefits for the provincial and federal levels of government generated by sales tax on real estate transactions will be in the order of \$18.3 million, made up of \$12.3 million for Quebec sales tax (PST) and \$6 million for the tax on goods and services (GST).
- The benefits from the duties on transfer of immovables (welcome tax) are estimated to be \$3.3 million.



Pierre Malo image bank, 1999

Transformation of Bonaventure Expressway will stimulate real estate development in the area

To do this, the firms GVA Devencore, Langlais et Associés, Géocom and Horwath Horizon Consultants evaluated the development potential in the study area in terms of four broad market categories: offices, residential, retail and hotels.

The firm Altus Helyar, using the conclusions of these market studies, and the planning concept of Cardinal Hardy, determined the potential real estate value of the three city blocks, owned by the City of Montreal, that currently support the elevated structure of the Bonaventure Expressway, and then evaluated the property tax benefits that would be generated by building on these parcels of land.

A summary of the study results follows.

Introduction

The Bonaventure Expressway transformation project at the downtown gateway provides an opportunity to enhance the main point of entry into the business district, to extend the downtown functions along the University Street corridor and to rebuild the surrounding area, while at the same time increasing the property tax base of the City of Montreal.

Thus the first phase of the Bonaventure Expressway transformation project will allow the City of Montreal to put to better use its real estate assets, currently used mainly for road infrastructure and parking.

In order to evaluate the real estate feasibility and the economic and tax benefits of the project, the SHM and the SHDM (Société d'habitation et de développement de Montréal) mandated five firms to validate and further develop the prefeasibility study results produced by the firms Genivar et Lemay in 2005-2006. These firms had already evaluated the real estate investments at over \$800 million for all of the study area, following the transformation of the Bonaventure Expressway at the downtown gateway.

Construction site, Cité internationale place, facing Victoria Sq in 2000



Pierre Malo image bank, 2000

Office Sector

The most recent data of GVA-Devencore consultants suggests that local demand for office space will, undoubtedly, generate new office tower construction projects downtown in the coming years. Several factors support the start-up of office projects. In particular, the combined office vacancy rate (categories A and B) reached 8.2% at the end of 2006, the lowest level since 2002.

Main conclusions of the market study²

- Downtown Montreal has 44.1 million sq ft of office space, of which 64% is in the business district.
 - The average absorption rate of these spaces over the last decade was approximately 440,000 sq ft (\pm 40,900 m²) per year for the whole of the downtown area.
 - Since 1998, the share of the QIM, the *Cité Multimédia* and Old Montreal in the downtown market has more than doubled, going from 8% to almost 20% of the total inventory of office space.
 - Three quarters of the 3.5 million sq ft of office space (\pm 325,000 m²) built downtown since 1998 were generated by government initiatives (*Cité Multimédia*, *Cité du commerce électronique*, *Centre CDP Capital*);
 - The total office area of planned projects is estimated at approximately 150,000 m²;
 - The promoter Westcliff's project, la Cité Internationale, facing Victoria Square, is in the study area.
- The promoter Magil/La Laurentienne's Projet 701, on University Street, south of the Tour de la Bourse, is in the study area (blocks 3P-20/3P-21). The planned construction of a commercial building on these city blocks will allow a link to the Métro network to be established.
 - The overall vacancy rate in Montreal's downtown market plunged from 8.9% to 8.2% between the second quarter of 2006 and the end of the year. The vacancy rate of downtown office buildings, categories "A" and "B", have remained under the 10% bar for almost two years. When vacancy rates reach this level, the market tends to favour the owner and to generate the implementation of new construction projects, but in the event, such has not yet been the case. In fact, rents have remained relatively stable, and there remains sufficient large blocks of contiguous space to ensure the competitiveness of the real estate market. However, if the market continues to tighten, this dynamic could change rapidly.

2. Study carried out from an inventory of 190 buildings in the following areas: business district, QIM/*Cité Multimédia*/Old Montreal, downtown west/Westmount and downtown east.)



Pierre Malo image bank, 2000

Over a twenty-year timeframe, the Bonaventure Expressway area could be providing up to 30% of downtown office space

History and forecast of annual absorption up to 2025

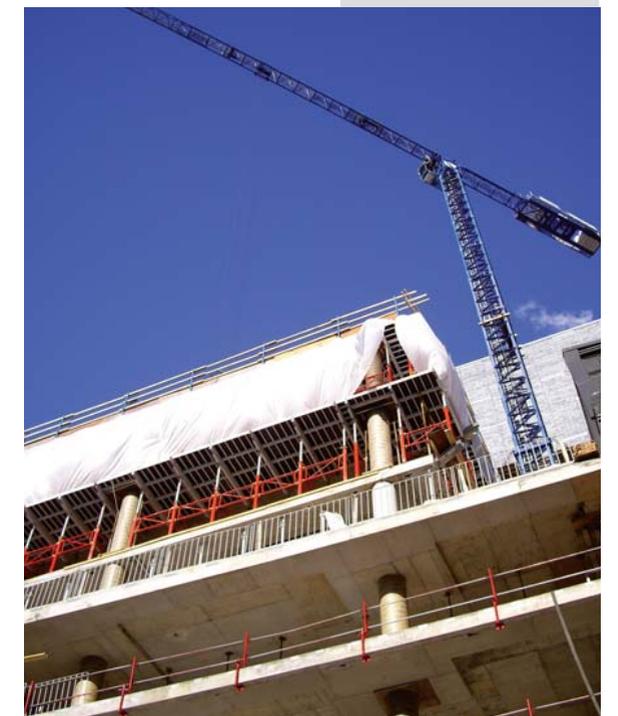
Based on a historical average annual absorption rate of 40,000 m² for all of the Montreal downtown area, the demand for office space for the next twenty years will be 800,000 m². Thus, recognizing the availability of "supply" in the order of 450,000 m² in future projects, the additional "demand" for office space is estimated for all of the downtown area to be in the order of 350,000 m². Assuming that the study area's market share of this additional demand is in the order of 25% to 30%, we estimate the total office space on the site, in a twenty-year timeframe, to be between 90,000 m² and 105,000 m². The most appropriate sites to respond to this demand are in the northern part of the area, near the Business District, the Métro and the underground city, and in the natural continuation of the QIM.

One of the important factors in the success of the area's future development remains the quality of its urban planning, as shown in the neighbouring area, the QIM.

Because of its strategic location at the city's gateway, the study area has the following attributes that support its marketability:

- **City gateway:** gives an upscale, prestigious image, as well as great potential visibility to future corporate occupants
- **Extension of the *Quartier international* and Old Montreal:** the project should develop its links with these sectors and benefit, by extension, from their upscale image.
- **Close to the business district:** potential for a direct link to the "underground city" and the Métro in the northern part of *faubourg des Récollets*.

Expansion of the Quebecor head office in Victoria Sq, 2007



Residential Sector

The comparative study of five areas located around the Bonaventure Expressway (*centre-ville élargi*) led the firm Langlais et Associés to conclude that the future residential clientele of the study area would doubtlessly be comparable to the current clientele of Old Montreal and *Faubourg des Récollets*.

In order to better target the future clientele of the project study area and recommend residential "products" adapted to their needs and expectations, the firm prepared a profile of the population residing in Old Montreal and its *faubourgs*.

The McGill West project helps consolidate the residential function of the *Faubourg des Récollets*



Pierre Malo image bank, 2006

Highlights of the market study

- Close to 75% of the 4,500 households own their own dwelling;
- The households have an average size of 1.6 persons;
- Close to 50% of the households have a revenue of \$100,000 or more;
- The average value of properties is \$330,000;
- An average of 325 new housing units were built annually since 2000.

Building the M9 project, in sight of the Bonaventure Expressway



Development potential – downtown area

According to the firm Langlais et Associés, the high level of activity since 2000 in the *centre-ville élargi* suggests that the housing stock now has sufficient critical mass to justify a sustained volume of construction and resale activity, and show less sudden changes in the poorer years. Based on this premise, the average construction rate should be in the order of 1,000 units per year, with peaks reaching up to 1,600 and lows of about 900 dwellings per year, in the *centre-ville élargi*.

Development potential – study area

The building and absorption in the study area could represent about 10% of the annual potential, i.e. 90 to 160 dwellings per year, depending on the state of the market in the *centre-ville élargi*. Because a completely new residential area is envisaged, it must be expected that the absorption will be slower at the beginning, being affected by the new and non traditional character of the product, price levels and the competition of other projects in the *centre-ville élargi*. In view of these findings, the development of the study area could be envisaged over a twenty-year timeframe, divided into four periods:

- 2011-2015 : absorption of 355 units over five years;
- 2016-2020 : absorption of 455 units over five years;
- 2021-2025 : absorption of 600 units over five years;
- 2026-2030 : absorption of 615 units over five years.

Thus, more than 2,000 housing units could be built and absorbed in the overall study area between now

and 2030. This forecast depends, however, on the premise that the economic situation remains favourable to the development of residential housing projects, that the resale market remains active and that mortgage rates remain relatively low.

Recommendations

It appears that if the downtown absorption trend in regard to residential units continues, the 2010-2011 market will be an interesting window for the delivery of well positioned and well targeted projects, particularly in the project area at the junction of the *Faubourg des Récollets* and Griffintown where the competition is non existent

In view of the residential market characteristics in the study area, and of the absorption forecast up to 2030, it is recommended that a residential typology for the study area be developed that includes the following elements:

- 65% are one bedroom units, with a liveable floor area of 450 to 650 sq ft;
- 25% are two bedroom units, with a liveable floor area of 800 to 1,000 sq ft;
- 10% are Penthouse-type units, with a liveable floor area of 1,500 to 2,000 sq ft.

This distribution could include a portion of affordable housing in accordance with available government programmes.

Retail Sector

Géocom's market study analysed the commercial zone in which the Bonaventure Expressway transformation project would "recruit" most of its clientele, specifying the area where the project's influence would be the strongest (primary zone).

Commercial demand and development potential

The commercial "reference zone" in the study area is bordered by Peel Street to the west, Ville-Marie Expressway to the north, McGill Street to the east and De la Commune Street to the south. It is estimated that there are 15,500 workers in this zone, including the employees of the hundreds of businesses in the *Cité Multimédia*. To the east of the study area, Old Montreal and the Old Port have between 13 and 15 million visitors annually. These visitors return frequently and are largely Montrealers.

The overall demand in this commercial zone, within the study area, is evaluated at \$141.1 million for the current year. A strong percentage of this potential (67% or \$95.4 million) is generated by the resident population. This demand should grow by \$109 million between 2007 and 2021, driven by the growth of the local population and the number of workers in the commercial zone. It must be noted that this forecast assumes the addition of more than 2,000 residential units in the overall study area.

Between 1996 and 2001, the population of the broader "overall" Montreal commercial zone showed 9% growth, with significant peaks in the areas where the condominium projects were numerous, notably in Old Montreal and in the western part of the business district



The commercial component of the study area should be focused mainly on providers of current consumer goods and services

From a socio-economic perspective, it was noted that the overall commercial zone is, in the majority, Francophone, well educated, with small families and with an average revenue higher than that of the Montreal region households.



Pasta Café, a local business well known to *Cité Multimédia* workers

Main conclusions of the market study

In the light of the analyses and considering the outlying location of the commercial zone of the study area, relative to the downtown competition (Sainte Catherine corridor), the commercial component should occupy a "gross leasable area" of 70,000 to 90,000 sq ft (6,500 to 8,400 m²) and be focused mainly on businesses providing current consumer goods and services to the local clientele and area workers. The commercial component of the study area should be focused mainly on providers of current consumer goods and services, in order to serve the local area clientele and the workers in the surrounding area.

General planning criterion for commercial spaces

Concentrate commercial activity, as much as possible, in a single area

- The creation of a "pole" or hub will serve to attract customers as well as create interaction amongst the clientele of the different businesses.
- The commercial part of the study area should be concentrated within block 3-P22, bounded by Notre-Dame, Saint-Maurice, Duke and Saint-Henri streets, so as to obtain maximum visibility and good accessibility.
- The commercial part of the study area should consider food, restaurant and current consumer services.

Locate commercial spaces on one floor

- It is often most difficult to motivate shoppers to go to another floor, as discovered in the underground shopping malls of downtown Montreal.
- It is best to locate commercial functions adjacent to the street, facing outwards.

Facilitate vehicle access to commercial spaces

- It is proposed that underground parking spaces be provided in order to reduce constraints (traffic volume, one-way streets, etc.). As well, curb side parking at the street level is also recommended.

3. Total persons e.g. a person who visits three tourist sites in the same day counts as three persons.

Hotel Sector

Development of the market

Neighbourhoods adjacent to the study area, the QIM and Old Montreal have a hotel stock that is ever larger and more popular. Built for the most part between 2001 and 2006, its hotels have created a new synergy and have reinforced the area as an alternative "pole" or hub to the downtown area for commercial and tourist lodging.

To determine the study area's hotel development possibilities, the firm Horwath defined Bonaventure's competitive market, i.e. the group of hotels of over 25 units, categorized three stars and above by the Corporation de l'industrie touristique du Québec (CITQ), situated within a kilometre of the right of way of the Bonaventure Expressway.

New outlets contributed to the reputation of the QIM as a major hotel hub



Analysis of demand

The demand for commercial lodging in the competitive market comes particularly from the following clientele:

- corporate;
- government;
- pleasure, individual or group;
- business meetings and conventions.

To evaluate the trends that could impact a future hotel project, Horwath carried out a comparative analysis of the "downtown hotel market" and of the "Bonaventure area competitive market" that allowed the firm to establish that:

- Both markets have had almost constant growth of available units (supply) since at least 1989, and of hotel demand since 1991. It should be noted, however, that in terms of both supply and demand, the Bonaventure area stands out with growth twice as high as that of the downtown market.
- between 1997 and 2006, the occupancy rate in the Bonaventure area competitive market varied between 63% to 73% from 1997 to 2006 and exceeded by 1.3%, on average, the downtown occupancy rate;
- between 1993 and 2006 the daily price per unit in the Bonaventure area competitive market had an annual average growth rate of 4.4%. Since 1997, these prices exceed by about \$15 (or 11%) those of downtown hotels.



Gault, www.hotelgault.com

Panoramic view of the Gault Hotel lobby, opened in June 2002. 449 Sainte Hélène Street

Recommendations

In view of the continuous improvements in Old Montreal and the QIM, of the expansion of the *Palais des congrès de Montréal* and of the development of the hotel sector in that part of the city, the five identified sites all reflect the potential necessary to have, in five to ten years, one or more new hotel projects.

On the basis of an analysis of the supply and demand in the competitive market, three types of eventual hotel development are therefore recommended (see: *Key plan of Bonaventure Expressway transformation project*, page 12).

Blocks 3P-20, 3P-21 or 3P-22

These properties are located close to large generators of hotel demand such as the business district, Old Montreal/Old Port, the QIM and the many tourist attractions of the neighbouring areas. These properties will allow any new hotel project to benefit from the synergy created by the concentration of "supply" already in place.

Block 3C-16

This land is also located close to the business district, Old Montreal/Old Port, the QIM and the many tourist attractions in the neighbouring areas. However, being located further west, it is more distant from the concentrated "supply" already in place.

Block 3C-18

Located further south, this land is more removed from the large generators of hotel demand and the concentration of "supply" that is already in place. However, this site could be identified as an integral part of the city's gateway and could be an attractive asset for Peel Basin.

Front of Gault Hotel, opened in June 2002. 449 Sainte Hélène Street



Gault, www.hotelgault.com

Economic and Tax Benefits from the Three Central Blocks

The firm Altus Helyar was mandated to carry out a more detailed analysis of the potential real estate value of the three City of Montreal blocks, located under the elevated Bonaventure Expressway, that will be freed-up during the first transformation phase, starting in 2011. Subsequently, it carried out an evaluation of the economic and tax benefits that could be generated by the construction of buildings on that land, in terms of property and school taxes, provincial and federal sales tax (PST and GST) and the "duties on transfers of immovables" i.e. the welcome tax.

Proposed development scenario

Location of the blocks

The three central city blocks freed-up by the dismantlement of the elevated structure of the expressway, located between Saint-Paul and Wellington streets, are identified as being parcels 3-C16b, 3-C17 and 3-C18 (see: *Key plan of Bonaventure Expressway transformation project*, page 12)

Project implementation schedule⁴

The implementation schedule of the first phase of the Bonaventure Expressway transformation project is as follows:

- infrastructure and roadway: 2009-2011
- development of the sites: 2011-2013
- construction and delivery of the sites: 2013-2019

Location of the three City of Montreal-owned central city blocks

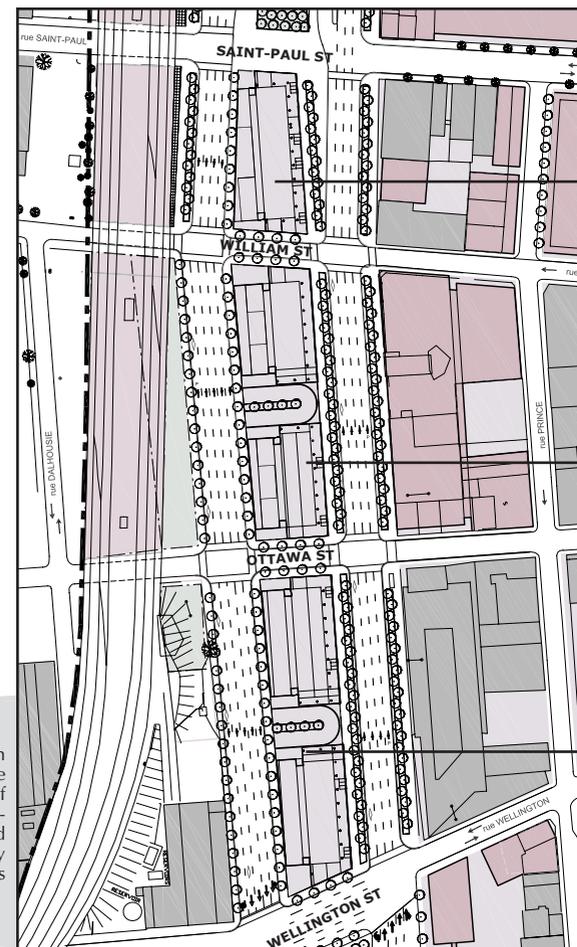
Analysis of the potential real estate value

The data, related to real estate potential, on buildable areas, utilisation and density were provided by *le Groupe Cardinal Hardy* (see *Table*, page 13). The forecasts of real estate tax benefits were calculated from the following data:

- the total value (in 2007 dollars) of the tax benefits, assuming the complete execution of the project;
- a staggering of the tax benefits, in 2007 dollars, over the period 2011-2019, in accordance with the rate of absorption and delivery;

- when completed, the market value of the proposed project, in current dollars, is \$284 million. For purposes of estimating the real estate tax benefits, 55% of the floor space will be residential and 45% will be offices.
- the sale of the three central City of Montreal blocks will generate \$16 million in revenue

For illustrative purposes, as well as for its analysis, Altus Heyar estimated the potential market value of the lands ready for development, and free of contamination, as follows:



- PARCEL 3C-16b**
- Area: 1 970 m² (21,204 sq ft)
 - Number of residential units: 250 units
 - Land value: \$4.5 M

- PARCEL 3C-17**
- Area: 3 860 m² (41,548 sq ft)
 - Number of residential units: 358 units
 - Land value: \$6.45 M

- PARCEL 3C-18**
- Area: 3 950 m² (42,517 sq ft)
 - Development potential: 45,000 m²
 - Land value: \$5 M



View of site for future central city blocks along De Nazareth Street, from Wellington Street

Pierre Malo image bank, 2007

Real Estate Tax Benefits

- The amount of property and school taxes potentially generated in accordance with 2007 rates, from the currently non taxable right of way, is **\$7.65 million** annually.
- The benefits, in terms of sales taxes, for the provincial and federal governments, would be **\$18.3 million**, i.e. **\$12.3 million** for the provincial sales tax (PST) et **\$6 million** for the tax on goods and services (GST).
- The benefits from "duties on transfers of immovables" (Welcome Tax) is **\$3.3 million**.

4. This schedule being long-term, the firm Altus Heyar could not forecast with certainty the economic situation that would prevail at the time. They assumed that the current favourable economic conditions would remain essentially the same during the execution of the project and that growing demand for downtown accommodation combined with the penury of vacant space, would continue to bring positive pressure on the development of these sites.

Part 3 : Technical Feasibility Studies

The elements of success from a transportation and traffic perspective

- Cooperation with the AMT (*Agence métropolitaine de transport*), City of Montreal and the STM (*Société de transport de Montréal*) to optimise public transportation in the Bonaventure corridor (e.g. downtown satellite terminals, dedicated bus lanes on the Bonaventure Expressway between Wellington Street and the Champlain Bridge; refurbish the toll booth area on the Champlain Bridge in order to give direct access to the downtown area as well as a local stop).
- Mitigation measures during the construction period (and possibly maintained afterwards) such as the implementation of a commuter train between the Chevrier *incitatif* park & ride facility and Central Station;
- Plans, with the *ministère des Transports du Québec*, to identify the appropriate means to manage safely the backed-up traffic at the De Nazareth exit from the Ville-Marie Expressway;
- Analysis and plans, with the City of Montreal, to improve traffic fluidity at the Saint-Jacques/University intersection, and to a lesser degree, the Notre-Dame/University intersection, at the evening peak period.



Amie Laurin image bank, 2005

View of city gateway from Bonaventure Expressway, 2005

Transportation and Traffic

The firm Tecsub had already, during the prefeasibility studies, evaluated the main impact on traffic flowing from the transformation of the Bonaventure Expressway between Champlain Bridge and the downtown area. The subsequent decision to proceed with the transformation of the expressway in three phases required a supporting study, specifically examining the section north of Peel Basin. It sought to take into consideration this new approach, update the data on the forecasted volumes related to the main development projects in the area, and analyse in greater detail the main impacts identified during the prefeasibility studies.

Addressing specifically the first phase of the transformation project, the downtown gateway, this mandate called for the analysis of the Bonaventure corridor between Brennan and Saint-Jacques streets, including the intersections of Wellington, Ottawa, William, Saint-Paul, Saint-Maurice and Notre Dame streets.

The main objectives of the study include the following:

- update current traffic conditions;
- propose road geometry for the corridor as input to the studies of urban development and real estate potential;
- quantify the impact of this geometry on traffic and identify mitigation measures;
- optimize the effectiveness of public bus service between the downtown terminus and the Bonaventure Expressway.

The main challenges of Bonaventure Expressway transformation, Phase 1, lie mainly in balancing the supply and demand of movement in the corridor, in maintaining interfaces with the Ville Marie Expressway, in identifying optimal routes for public transportation and in freeing up space suitable for real estate development in the transformed corridor.

Furthermore, to ensure that this project contributes to real urban regeneration of the area, it is essential to reconfigure the road network on a more urban scale, guided by "urban development" principles.

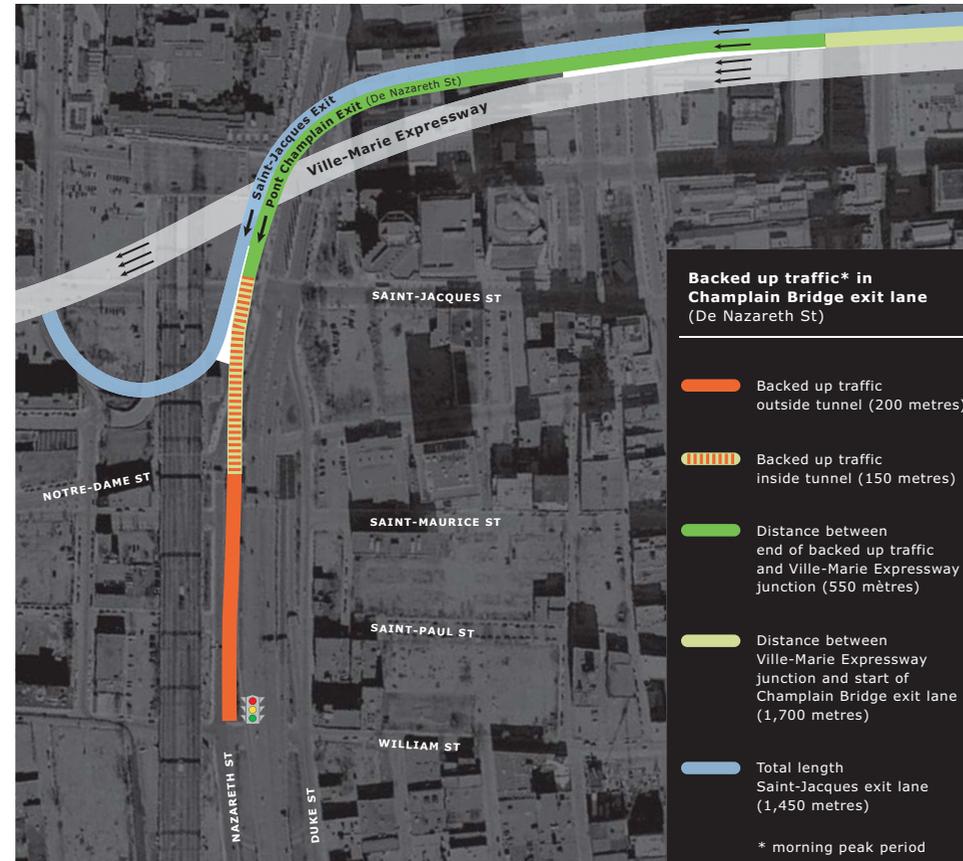


Current view of ramp to Ville-Marie Expressway

Groupe Cardinal Hardy

Main findings of the study

- No traffic problem anticipated, during the morning peak period, at the Bonaventure Expressway's Wellington exit due to the decision by 10% of motorists to choose an alternative route.
- Reduced congestion during the morning peak period at the University/Saint-Jacques intersection, as well as at the Ville-Marie Expressway's Saint-Laurent/Sanguinet exit.
- Backup of traffic of 350 metres during the morning peak period, including approximately 150 meters in the tunnel, at the exit from a curve, in the Ville-Marie Expressway's De Nazareth exit lane in the direction of Champlain Bridge. The exit lane remains clear for a further 550 meters behind the last car in the backed up traffic, extending back to the junction with the Ville-Marie Expressway.
- Reduced level of service at the evening peak period at the Saint-Jacques/University intersection and to a lesser degree at the Notre-Dame/University intersection.



In addition, congestion could be observed during the peak evening hours, the analysis having shown that 200 vehicles could not be "satisfied" by the post-transformation capacity. Among the "dissatisfied" were a number of vehicles from the Ville-Marie Expressway. It is therefore important to envisage safety measures at the Ville-Marie Expressway exit ramp, towards De Nazareth Street, to deal with the expected backup of vehicles of up to 315 meters, including approximately 115 meters in the tunnel at the exit from a curve; however, this backup only occurs on 30% of the exit lane and thus does not interfere with traffic on the expressway itself.

The transformation of the corridor will bring certain advantages in regard to traffic:

- Reduction in the number of vehicles at the corner of Saint-Jacques and University streets in the peak morning hours: this will help diminish traffic congestion at this major intersection and facilitate the traffic flow coming from Saint-Jacques Street;
- Reduction in the number of vehicles at the Saint-Laurent/Sanguinet exit on the Ville-Marie Expressway.

It is also important to note that this project is different from the great majority of infrastructure redevelopment projects in that the primary justification is not strictly that of traffic pressure, but rather those of urban regeneration, sustainable development and financial viability.

Proposed road geometry

The competing needs of road traffic versus the demands of development can only be rationalized through a number of compromises. It is therefore proposed to provide an urban arterial road of four through-lanes in each direction with occasional auxiliary turning lanes when required. In addition, to maintain the appropriate number of through lanes and to reduce the traffic conflicts to a minimum, the integration of the on-off ramps of the Ville-Marie Expressway requires three-lane sections between the on ramps, located south of Notre-Dame street, and Saint-Jacques street.

In addition to the through lanes, the corridor has, where needed, a number of auxiliary lanes. In a northerly direction, an auxiliary turning lane dedicated to public transportation is needed when approaching Wellington from the south. In a southerly direction, auxiliary turning lanes to the

right are envisaged on the approaches from the north to Notre-Dame, William and Wellington streets in order to facilitate the exit from the downtown area during the peak evening period.

Impact on traffic

In order to estimate the impact on traffic caused by the reduction in road capacity in the Bonaventure corridor, the modelling department of the MTQ (*ministère des Transports du Québec*) carried out simulations of the peak morning period (current state and current state with capacity reduction between Wellington and Saint-Jacques streets). It should be noted that a "worst case" scenario was envisaged in this study in order to show the most difficult traffic conditions, without considering the very likely migration of motorists towards public transportation.

The study showed that for the peak morning period, approximately 10% of current traffic would no longer use the Bonaventure corridor, north of Wellington Street. Diverted from their usual itinerary, motorists would look for alternative routes in order to reduce their driving time. The suggested geometry envisages a minimal transfer of approximately 600 vehicles that, instead of using the Bonaventure corridor in a northerly direction during the peak morning hours, would, instead, choose other routes. In particular, these analyses showed that, in comparison to the current situation, the proposed geometry and future development would lead to the new corridor receiving 6% fewer vehicles in the peak morning period and 8% fewer in the evening peak. Simulations also revealed that in the peak morning hours, the average traffic back up would not go beyond Victoria Bridge.

Public transportation

The Bonaventure Expressway corridor plays an essential role in public transportation from/to the South Shore of Montreal. It is thus essential that any Bonaventure Expressway transformation project take full account of this factor.

Integration of project SLR A-10/Downtown

The concept of urban development suggested by the firm Cardinal Hardy (see Part 1) is completely compatible with the planned route for a future SLR in the recent AMT (Agence métropolitaine de transport) report, as well as with the Multimédia station proposal in the same report.

Dedicated bus lane between Champlain Bridge and Wellington Street

The prefeasibility study recommended, as part of the proposed Bonaventure Expressway transformation project, the provision of a dedicated bus lane in

each direction between Wellington Street (Peel Basin) and Champlain Bridge. The need to defer, until after 2015, the Phase 3 redevelopment of the expressway between Victoria Bridge and the Peel Basin threatened to unduly delay this beneficial public transportation initiative. However, the proposed plan for entry and exit to the expressway at Wellington Street will allow the provision of a lane dedicated to buses between Champlain Bridge and Wellington Street. The concurrent refurbishment of the former tollbooth area on Champlain Bridge would allow the buses to reach the downtown area in a dedicated lane on the Bonaventure Expressway, thereby shortening the route by 1.5 kilometres and eliminating a difficult traffic light on Highway 15 during the evening peak period.

Route between Wellington Street and the downtown terminus (TCV – 1000 De La Gauchetière)

The South Shore buses, in a northerly direction, currently use the Wellington exit from the express-

way at the Peel Basin and continue on Duke Street to William Street where they go under the expressway to De l'Inspecteur Street from where they have dedicated access to the downtown terminus.

In the traffic study, the consultants (Tecsult) were given a mandate to determine if an alternative to the Bonaventure corridor existed for South Shore buses. The simulations carried out confirmed that an alternative route using Wellington, Ann and De l'Inspecteur streets (west of the CN tracks) would meet this objective in both the morning and evening peak periods.

The proposed conceptual plan nevertheless suggests the alternative of a fifth lane on De Nazareth Street between William and Wellington streets if it was desired to maintain public transportation in the "Bonaventure Corridor".

The selection of the final public transportation corridor between the Peel Basin and the downtown terminus must, however, be made in consideration of another extremely important factor, the AMT

(Agence métropolitaine de transport) decision on the provision of a downtown satellite terminus to compensate for the lack of capacity (maximum 200 buses) of the current terminus. It will therefore be necessary, when preparing the pre-project to work closely with the AMT so as to identify the preferred bus route in accordance with its decision on a new satellite terminus and to evaluate its impact on the customer service plan.

Harbourfront tramway : a structuring project

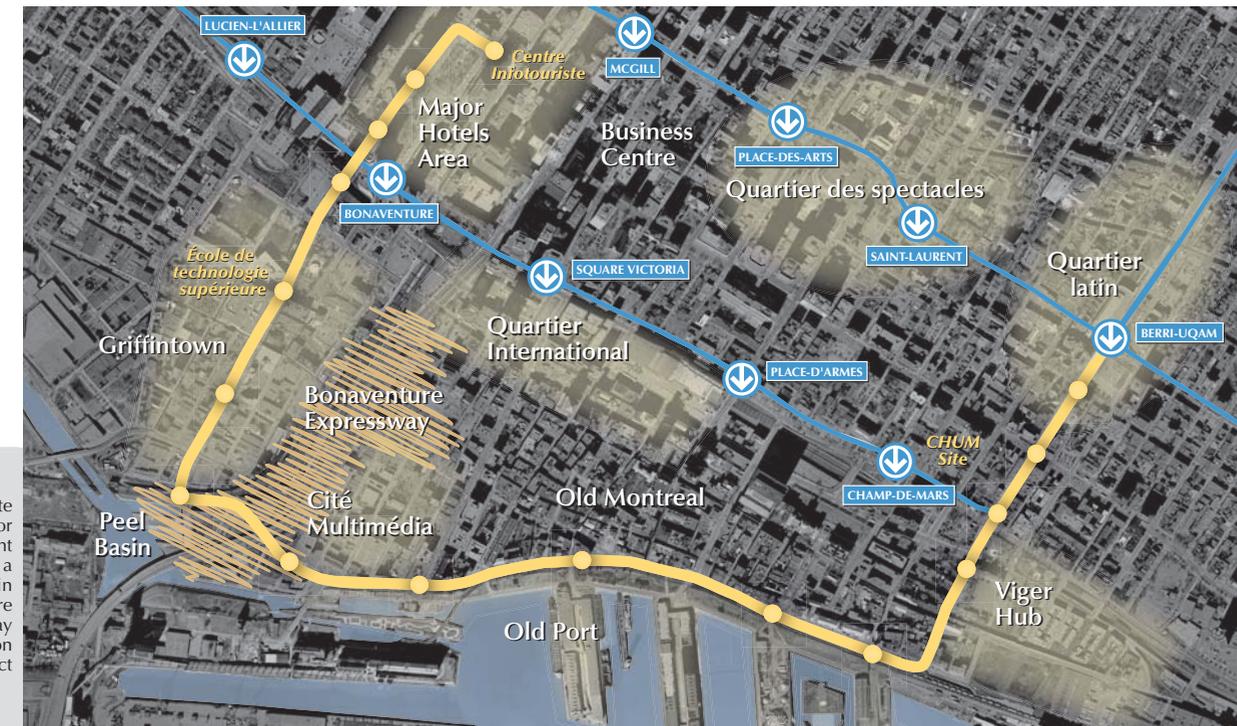
The SHM's *Vision 2025* proposes the implementation of a tramway service linking the Montreal harbourfront to the downtown area, both in the west (the hotels district) and in the east (*Quartier latin* and *Quartier des spectacles*) by serving in particular Old Montreal and its *faubourgs*. The harbourfront tramway will be a most significant success factor in the Bonaventure Expressway transformation project, ensuring easy access from the Montreal public transportation network to the land freed up by the expressway's dismantlement and to the *Cité Multimédia*.

Photo by Stephen Matalucci. Source: stevestransitiste.fotopic.net



Public transportation to/from the South Shore merits particular attention

Route proposed for the harbourfront tramway, a success factor in the Bonaventure Expressway transformation project



This new public transportation service also seeks to:

- relieve congestion in the historic boroughs of Old Montreal and on the piers of the Old Port during peak periods;
- stimulate real estate development on the harbourfront by linking areas undergoing regeneration;
- connect the areas undergoing regeneration that will see large real estate developments along the tramway line (Griffintown, Peel Basin, Bonaventure city blocks, old Viger Station/*Faubourg Québec*, CHUM and the *Quartier des spectacles*);
- link Old Montreal, the Old Port piers and the Peel Basin to the downtown area and to the Montreal Métro network;
- provide the southern part of Ville-Marie borough and Griffintown with an access to public transportation

The tramway will serve the future occupants of the land freed up by the expressway transformation



Photomontage : Multiconcept Graphisme inc.

Intermodal transfer to public transportation

It must be remembered that this study sought to illustrate the "worst case" scenario in regard to traffic conditions, without considering a very likely intermodal transfer to public transportation. The identification of an effective public transportation corridor is thus an essential condition of success of the Bonaventure Expressway transformation project. Indeed, the analyses demonstrated clearly the need (as did the Montreal transportation plan) to enable an intermodal transfer to public transportation in order to reduce automobile congestion created by the new development, in both the Bonaventure corridor as well as over the whole of the downtown traffic network.

In addition to the above measures (i.e. the eventual implementation in the longer-term of the SLR A-10/ Downtown; the provision, in the short term, of a dedicated bus lane between Wellington Street and Champlain Bridge; the provision of a downtown satellite terminus; an optimal bus route between Wellington Street and the downtown terminus), the potential of mitigation measures, instituted during construction, to modify user habits should not be underestimated.



Quartier International de Montréal (QIM)

Since the start of construction in the QIM, the area's Métro stations have been much busier

Mitigation measures during construction

Several recent, large-scale, downtown projects, in particular in the QIM (*Quartier international de Montreal*), demonstrated that when construction sites have a major impact on traffic, motorists are more inclined to consider an intermodal transfer. It is at this time that the effectiveness of public transportation becomes key to the future, because a large number of those that change their habits for the construction period maintain those new habits once the project is completed. The best example of this phenomenon is the Montreal/Blainville commuter train service. This train was introduced, in fact, as a mitigation measure during repairs to the Marius-Dufresne Bridge on highway 117. The pilot project was such a success that the service was maintained after the end of construction and it now carries two million passengers, annually. It is plausible that a pilot project using the CN rail line between the Chevrier *incitatif* park & ride facility in Brossard and Central Station would have the same positive impact on public transportation.

Pre-project

The pre-project provides an opportunity to find effective solutions to the questions raised during the feasibility studies:

- Close cooperation with the *ministère des Transports du Québec*, to identify the appropriate means to manage safely the backed-up traffic at the De Nazareth exit from the Ville-Marie Expressway;
- Close cooperation with the City of Montreal, to analyse and plan to improve traffic fluidity at the Saint-Jacques/University intersection, and to a lesser degree, the Notre-Dame/University intersection, at the evening peak period.

The pre-project will also provide the opportunity to work in close cooperation with the AMT, the STM, the City of Montreal and the Jacques Cartier and Champlain Bridges Inc. to identify the complete set of measures to be implemented to optimise public transportation in the Bonaventure corridor, by:

- provision of a downtown satellite terminal for the South Shore buses;
- choosing the optimal route between Wellington Street and the downtown terminus;
- analysing, if necessary, the feasibility of a dedicated bus lane on the Bonaventure Expressway between Wellington Street and the Champlain Bridge
- refurbish the toll booth area on the Champlain Bridge in order to give direct access to the downtown area as well as return
- plan mitigation measures during the construction period such as the implementation of a commuter train serving the Chevrier *incitatif* park & ride facility or an increase in commuter train service on the Saint-Hilaire/Montréal line. This measure could be maintained after the completion of the construction work on the Bonaventure Expressway at the downtown gateway.

The elements of success from an environmental perspective

- In regard to land for development, between Wellington and Notre-Dame streets, the first analyses determined that it has few environmental problems;
- According to the forecasts of Environment Canada for the period 2007-2015, the impact of the expressway transformation and new construction on the quality of the air in the current and future sensitive zones would not be significant;
- The proposed new expressway configuration, that of an urban arterial boulevard equipped with traffic lights, leads to a reduction in vehicle speed (maximum 50 km/h), which could allow a reduced noise level in comparison to the current situation;
- The area should not be affected by vibration problems, following its transformation;
- In short, it is expected that all the negative environmental effects related to the Bonaventure Expressway transformation project at the downtown gateway, as identified in the sectorial studies, could be managed relatively easily by the institution of appropriate mitigation measures.

Environment

The SHM mandated the firm SNC-Lavalin Environment to conduct three supporting environmental studies as follows:

- A Phase 1 environmental characterisation;
- A sectorial study on air quality in the area, and on the intensity of noise and vibrations caused by automobile traffic, rail lines into Central Station and the Montreal energy distributor, Centrale de Chauffage Urbain de Montréal (CCUM);
- A schedule of environmental approvals required to start the Bonaventure Expressway transformation project.

Environmental characterisation study – Phase 1

The environmental characterisation, Phase 1, will aim at locating traces of real or potential contamination in the Bonaventure Expressway study area. It provides a history of land use, a document search,

an inspection of the sites and the preparation of a schedule of environmental approvals necessary to implement the Bonaventure Expressway transformation project. This first phase of environmental characterisation seeks primarily to:

- trace the history of previous owners and uses of the site;
- identify activities likely to have contaminated the site;
- locate the zones of known or potential contamination for which it might be necessary to carry out more detailed studies

History of land use

A review of the study area's land use history was carried out in order to identify the industrial and commercial activities, past and present, likely to have had an impact on the quality of the soil and the subsoil water. Some twenty sites were identified as having been exposed to potential sources of contamination from past and present activities or to the presence of underground tanks, structures or infrastructure.

Note that there is no precise data to confirm that these potential sources of contamination were removed from the sites or to prove that they were managed appropriately during demolition or after the cessation of activities. Consequently, all excavation in the study area is likely to consist of landfill of varying quality and could reveal the presence of debris (dry materials). In order to plan the appropriate management of excavation debris and demolition materials, with due consideration for reuse and recycling options, Phases II and/or III environmental characterisation studies will be necessary

Environmental issues

Certain environmental issues related to current activities were identified as likely to have an impact on the costs of the Bonaventure Expressway transformation project, particularly in regard to soil decontamination and material management during the construction period. The identified issues affect primarily the public works facilities on de la Commune Street, the snow chute south of Wellington Street and the Montreal district energy distributor, Climatization et Chauffage Urbain de Montréal (CCUM). However, it should be noted that these activities take place mainly on land located outside the area affected by the project, and are therefore most unlikely to be the subject of a change of use caused by the project's first phase. In regard to the land for development between Wellington and Notre-Dame streets, the first analyses determined that they present few environmental issues.

At the time of the pre-project, the analyses may well reveal the need to carry out a more detailed environmental characterization, particularly to confirm the presence or absence of contamination in certain parts of the study area as well as evaluating and specifying its nature and the scope of required work, if any.

Sectorial studies

Sectorial studies of air quality, and noise and vibration intensity, essentially seek to:

- identify the sources of any harmful effects in the study area;
- describe current conditions;
- evaluate the impact of the transformation project;
- propose mitigation measures, as required;
- determine the need for further supporting studies.

Air quality

The analysis of the current situation was conducted using data collected in 2005 in three stations of the City of Montreal's network of sampling stations located near the study area. The evaluation of the project's impact was carried out qualitatively, in zones particularly sensitive to air pollutants (e.g. residential developments already under construction or planned), according to criteria and standards for ambient air.

Traffic on the Bonaventure Expressway was identified as the main source of pollutants. Moreover, the City of Montreal data revealed that in 2005, even under the worst conditions, standards were not exceeded for benzene concentrations (C₆H₆), nitrogen oxides (NO_x), carbon monoxide (CO) and sulphur dioxide (SO₂) in the study area. Considering the levels in ambient air of these four pollutants in 2005 and the forecasts of Environment Canada over the period 2007-2015, the impact of expressway transformation, as well as new construction, on air quality in the current and future sensitive zones would not be significant.

The study also revealed that the only atmospheric pollutants (tropospheric ozone and particulate matter – PM_{2.5}), whose concentrations are of concern, indeed everywhere on the island of Montreal independently of the project, are the particulate matters and tropospheric ozone.

Temporarily, demolition work and transformation of the Bonaventure Expressway area could increase the concentration of these pollutants. Consequently, appropriate mitigation measures must be planned during the construction period in order to minimize the presence of particulate matter and tropospheric ozone in the area.

In the pre-project, a more detailed study of air quality could be carried out in order to evaluate the levels of ground (tropospheric) ozone concentrations and particulate matter (PM_{2.5}) in the study area and to determine their impact. The impact could, moreover, be reduced by integration into building design of various measures to improve air quality (e.g. HEPA filters, roof-level air intakes, powerful air exchangers, etc).

Noise

The analysis of the current situation, carried out using traffic flow data provided by the City of Montreal, led to the conclusion that traffic on the Bonaventure Expressway is the main source of noise in the study area. The other identified sources of noise are:

- trains operating in the vicinity of Central Station;
- the facility of the CCUM (Centrale de Chauffage Urbain de Montréal);
- Ville-Marie Borough public works facilities on de la Commune Street.

The evaluation of the project's impact was carried out for certain particularly noise-sensitive zones (e.g. residential construction or projected developments), using criterion applied by the *ministère des Transports* (MTQ) in its approach known as "integrated planning". (ref.: *ministère des Transports du Québec, Politique sur le bruit routier, 1998*).

The study predicts that the average daily noise level (LA_{eq}, 24h) in the sensitive zones would vary from 60 to 65 dBA following the transformation, a sound discomfort level described as "average" for residential areas, according to the evaluation tables of the MTQ. This evaluation is based on the premise

that the new configuration proposed for the expressway, that of an urban arterial boulevard equipped with traffic lights, causes a lowering of vehicle speed (maximum 50 km/h), allowing a reduction in noise below the current level.

In the pre-project, detailed noise studies should be carried out to optimize the results on the basis of future traffic flows. If need be, mitigation measures could be envisaged in order to ensure an acceptable sound environment, inside buildings as well as in public spaces, and most particularly in noise-sensitive zones, both current and future (e.g. residential developments).

Vibration

The area should not be affected by vibration problems following its transformation. Even the vibratory impact of the Canadian National rail lines should be negligible due to the reduced speed of the trains arriving at, or leaving, Central Station. However, these conclusions should be validated in the pre-project.

In addition, the planning of construction work must take into account the levels of vibration induced in the construction phases and ensure that these discomforting effects are managed by selecting suitable equipment.

In short, it is expected that all the negative environmental effects related to the Bonaventure Expressway transformation project at the downtown gateway, as identified in the sectorial studies, could be managed relatively easily by the institution of appropriate mitigation measures.

Regulatory approvals schedule

This section enumerates the statutes, regulations and approvals necessary to implement the Bonaventure Expressway transformation project. This non exhaustive list could be revised, in accordance with the results of the environmental characterization, Phase II.

The *Canadian Environmental Assessment Act* applies to projects with federal funding. A period of 2 to 3 months is required for the preparation of the prior examination. Then, a period of six to ten weeks is needed for the analysis of the project by the Canadian Environmental Assessment Agency (CEAA). It should be noted that the approval period can last up to 18 months if the CEAA considers that the project creates major impacts and refers it to an Examination Commission.

The *Environmental Quality Act* applies through articles 22, 31.53 and the subsequent sections, and article 32.

- Article 22 covers the request for a certificate of authorization for the project. In the SHM's schedule, a period of 2 to 3 months is required to prepare the request for a certificate of authorization. The approval period is 75 days maximum.
- Article 31.53 and the subsequent articles apply when there is a change in land use or when there is voluntary rehabilitation of a property that had been used for regulated industrial or commercial activities. Since it is likely that some parts of the study area could be affected by these regulations, a period of four to six months would be necessary to carry out characterization studies and to present a rehabilitation plan to the *au Ministère du Développement durable, de l'Environnement et des Parcs* (MDDEP). If the risk analysis is part of the plan, a minimum of six months to one year is required for approval.

- Finally, if the sewage and water networks in the area are to be replaced it would also be necessary to obtain authorization under article 32. Between two to three months are needed to prepare the request for a certificate of authorization. The approval period can be up to 75 days.

BY-LAW 87 and BY-LAW 90 of the *Communauté Métropolitaine de Montréal (CMM)* requires permits for atmospheric emissions and the discharge of wastewater into the sewer system. While these permits are often a formality, one must nevertheless reserve one to two months to obtain them.

It should be noted that none of the above-mentioned statutes or regulations require public consultation. However, given the project's scope, the city council or the executive committee of the City of Montreal could decide to have the *Office de consultation publique de Montréal* conduct consultations.

In conclusion, certain parallel activities could be initiated. Thus the following studies should be undertaken in the pre-project:

- verification of the applicability of Article 31.53 of the *Loi sur la qualité de l'environnement (LQE)* to the various lots in the study area.
- detailed environmental characterization study (Phases II & III), if required,
- detailed air quality study;
- detailed noise study, following a reassessment of traffic flows;
- A validation of the premise of minimal vibratory impact.




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