

Partnerships in Québec: for better municipal road safety

Catherine Berthod, Engineer and Urban Planner
Ministère des Transports du Québec

Carole Leclerc, M. ATDR
Ministère des Transports du Québec

Presentation prepared for the session
Strategic Road Safety Action Plans for Canadian Jurisdictions

of the 2013 Conference of the
Transportation Association of Canada
Winnipeg, Manitoba

Executive Summary

In Québec, more than half of injury crashes occur on the municipal road network. The municipalities can play a major role in contributing to reduce the road accident toll, which requires a stronger partnership among the municipalities, the Ministère des Transports and the various stakeholders.

To support the municipalities further in their actions, the first report of the Table québécoise de la sécurité routière, published in July 2007, proposed three recommendations on municipal partnership: share knowledge and road safety intervention tools with municipalities; design consultation mechanisms tailored to local or regional realities; establish financial assistance for road safety actions led by municipalities.

These recommendations have been concretized in many actions over the past few years. Thus, a pilot project was carried out and another is in progress to prepare a road safety diagnosis and action plan for the municipal network. These projects have allowed the development of an innovative diagnostic methodology, as well as a partnership strategy and a mode of organization adapted to the characteristics of the two territories, one located on the periphery of the Montréal agglomeration, and the other in a rural area.

In addition, in September 2012, a new program, the Plan d'intervention en infrastructures routières locales (Local Road Infrastructure Intervention Plan) was established to assist the regional county municipalities and equivalent territories in planning their interventions on the local network, by producing municipal road safety diagnoses and action plans.

Partnerships in Québec: for better municipal road safety

1. Current situation in Québec

1.1 Road safety on the municipal road network

In Québec, the road network managed by the municipalities represents approximately 107,000 km, or 76% of the province's entire road network. The network under the jurisdiction of the Ministère des Transports is about 31,000 km long (22% of the total); the other roads are managed by different bodies, such as Hydro-Québec or the Ministère des Ressources naturelles.

The management of the majority of the municipal road network is the responsibility of small municipalities, which are the most numerous, while 15% of the network is located in the ten biggest cities (Table 1).

Table 1. Length of the municipal road network by municipal population

Population	Number of municipalities		Length of the network	
Over 100,000	10	1%	15,500 km	15%
20,000 to 99,999	44	4%	13,000 km	12%
5,000 to 19,999	122	11%	18,000 km	17%
Under 5,000	935	85%	60,400 km	56%
Total	1,111	100%	106,900 km	100%

Sources: Demographic data from the Institut de la statistique du Québec, 2011. Estimate of the length of the road network (2013) and data compilation by the Ministère des Transports du Québec.

The distribution of accidents is explained not only by the length of the road network but also by vehicle volume and traffic conditions on the network. Thus, 52% of injury crashes and 42% of fatal and serious injury crashes occur on the municipal network, where the speeds are generally not as high and the traffic flows are lower than on the MTQ network, composed of freeways, transit routes, national and regional highways, and collector roads.

These factors also explain why 57% of injury crashes that occur on the municipal network happen in Québec's large cities, where the majority of the population is concentrated and where there are many trips (Table 2). In municipalities of under 5,000 inhabitants, in more rural areas, the length of the road network is longer, but traffic is less intense and the number of accidents is lower.

Table 2. Number of injury crashes on the municipal road network, by municipal population

Population	Injury crashes (annual average)	%
Over 100,000	9,940	57%
5,000 to 99,999	5,460	31%
Under 5,000	2,140	12%
Total	17,540	100%

Source: Accident data from Société d'assurance automobile du Québec, 2007-2009. Processed by the Ministère des Transports.

Compared to the road network under the jurisdiction of the Ministère des Transports, the accident typology on the municipal road network presents the following characteristics¹:

- 75% of injury crashes occur on streets where the speed limit is 60 km/h or lower (23% on the MTQ network). These streets represent the main part of the road network of large cities of over 100,000 inhabitants.
- 22% of injury crashes involve pedestrians or cyclists (5% on the MTQ network). These users mainly circulate in cities.
- 56% of injury crashes are collisions between vehicles (52% on the MTQ network) and 19% involve only one vehicle (39% on the MTQ network). These accidents occur particularly in rural areas.

1.2 Recommendations of the Table québécoise de la sécurité routière

In 2007, similar findings had led the Table québécoise de la sécurité routière, to conclude that a significant reduction of crashes in Québec can only be achieved by an improvement of both the municipal road safety record and the MTQ road safety record (9). The Table specified that such an objective requires a stronger partnership among the MTQ and the municipalities so that they benefit from the knowledge, the intervention tools and the technical and financial support they need.

To support the municipalities further in their actions, the Table's first report, submitted in July 2007, contained three recommendations on municipal partnership:

- Share knowledge and road safety intervention tools with municipalities;
- Design consultation mechanisms tailored to local or regional realities;
- Establish financial assistance for road safety actions led by municipalities.

¹ Data from Société de l'assurance automobile du Québec, 2007-2009. Processed by the Ministère des Transports.

To follow up on these recommendations, the Ministère des Transports du Québec formed a working group composed of representatives of the Union des municipalités du Québec (UMQ), the Fédération québécoise des municipalités (FQM), Ville de Montréal, the Ministère des Affaires municipales, des Régions et de l'Occupation du territoire (MAMROT) and the MTQ. The group's mandate was to generate concrete measures and ensure their implementation. The actions it proposed led to several achievements, which are detailed in the following sections.

2. Sharing knowledge

In support of its sharing knowledge recommendation, the Table québécoise de la sécurité routière recognized the need to help the municipalities increase their level of expertise in the road safety field. To analyze road safety problems and take the most effective measures to resolve them, the municipalities must have access to the most recent technical manuals and guides. The publication of synthesis documents or decision help tools is also very useful, particularly for the smallest municipalities, which account for most Québec municipalities (see Table 1).

In this perspective, several documents have been produced over the past few years for elected officers, managers and technical staff of municipalities and engineering firms, in various road safety fields:

Regarding speed control, the pamphlet *Aide à la détermination des limites de vitesse sur les chemins du réseau routier municipal* (Assistance in setting speed limits on the municipal road network) (3), and technical data sheets on traffic calming (5) and speed humps and cushions (6).

Regarding promotion and safe transportation for schoolchildren, the guide *Redécouvrir le chemin de l'école. Guide d'implantation de trajets scolaires favorisant les déplacements actifs et sécuritaires vers l'école primaire* (Rediscovering the way to school. Guide to implementation of active and safe routes to elementary school) (8).

Regarding road infrastructure design: regular update of the *Normes de conception et de signalisation* (Design and signage standards) (7), and the *Velo-Québec* technical guide *Planning and design for pedestrians and cyclists* (10).

Regarding road safety analyses, the *Guide méthodologique d'élaboration d'un Plan d'intervention de sécurité routière en milieu municipal* (Methodological guide to development of a municipal road safety intervention plan) (4). The Guide proposes a methodology for preparation of a road safety diagnosis and action plan.

All the information intended for municipalities regarding road safety was also consolidated on a page of the MTQ website, at www.mtq.gouv.qc.ca, in the Partenaires, Municipalités, Sécurité routière (Partners, Municipalities, Road Safety) section.

Awareness actions are also performed regularly, mainly in the form of presentations delivered at congresses and symposiums aimed at a municipal clientele.

3. Consultation mechanisms

Concerning the second recommendation on municipal partnership formulated by the Table québécoise de sécurité routière, which sought to design local and regional committees, the working group proposed the development by these committees of a road safety diagnosis, followed by an action plan with measures related to enforcement, education, raising awareness, and improvement of municipal infrastructure.

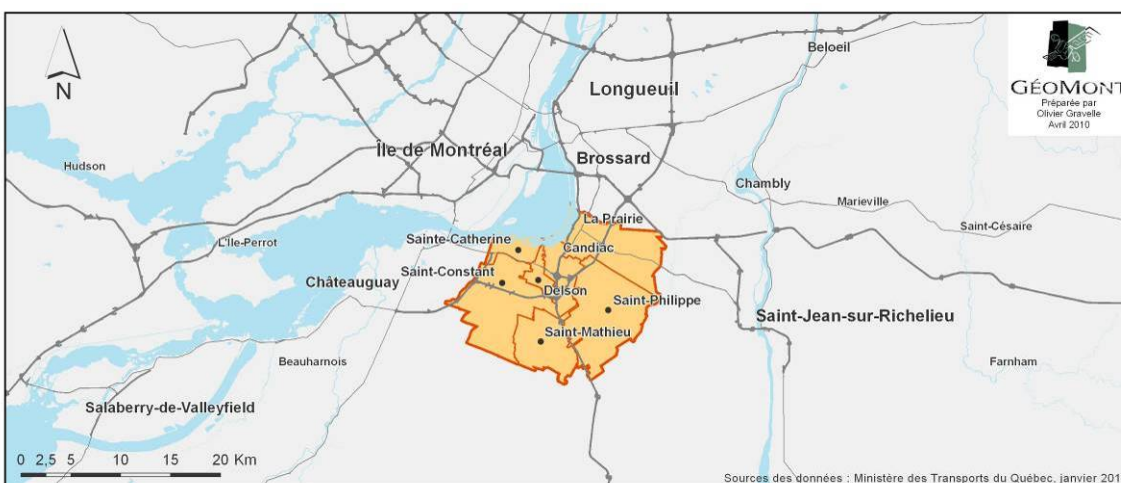
Since there were very few experiences concerning the achievement of such a concerted approach, outside certain large cities, it was first decided to carry out a pilot project. The objectives, in particular, were to experiment with a partnership approach the production of a municipal road safety diagnosis and action plan, and a user-friendly analysis methodology tailored to municipal realities.

3.1 Pilot project for a road safety diagnosis and action plan within the territory of MRC de Roussillon

The first pilot project was conducted from January 2010 to August 2011, in seven municipalities of Municipalité régionale de comté (Regional county municipality, MRC) de Roussillon served by the Régie intermunicipale de police Roussillon (RIPR). This project was carried out by Agence géomatique montréalaise GéoMont, with the financial contribution of Infrastructures Transport and the Ministère des Transports du Québec (1).

These seven municipalities were: La Prairie, Candiac, Delson, Sainte-Catherine, Saint-Constant, Saint-Philippe and Saint-Mathieu. All these municipalities are located near the Montréal metropolitan area and have seen continuous population growth over the past few decades, accompanied by a notable evolution of their road infrastructure. In addition, they are attached to the same police department, which facilitates data sharing.

Figure 1. Study area of the MRC de Roussillon pilot project



The pilot project sought to experiment with the stages of implementation of a municipal road safety diagnosis on a regional territory. It also had to account for the experiences and the work already performed in the field, within and outside Québec.

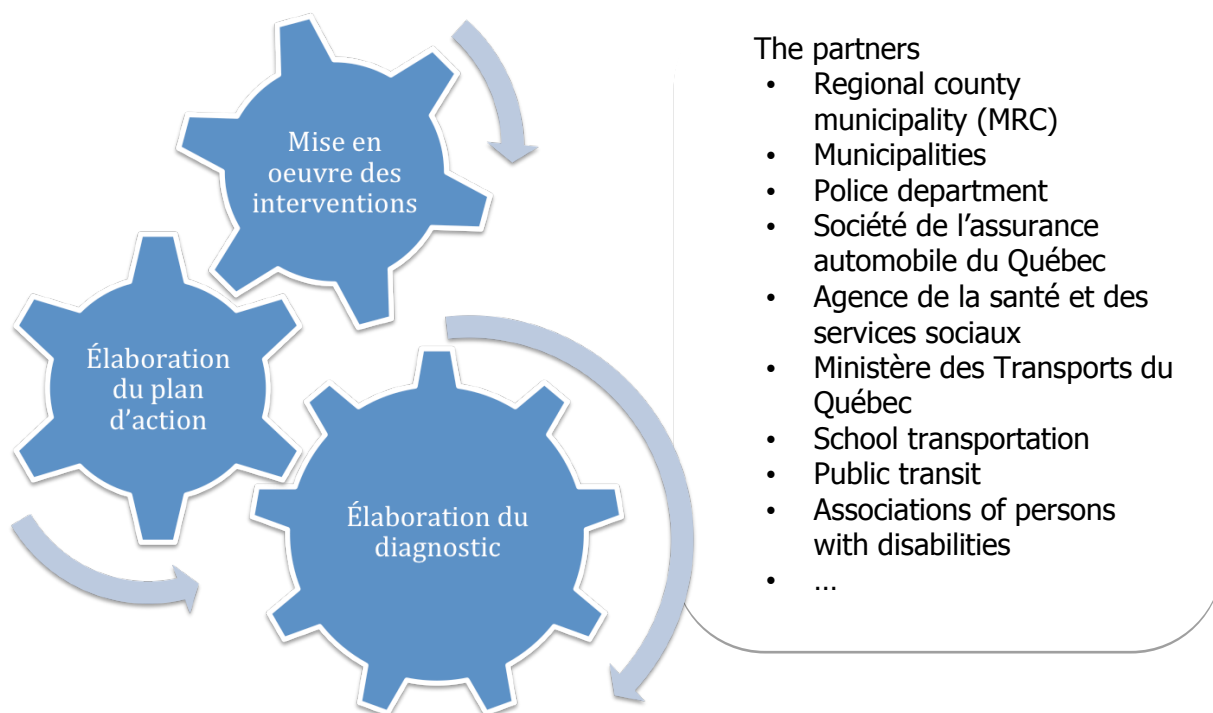
Based on these indications, the project's objectives were defined as follows:

- Improve road safety on the municipal network of the study area;
- Sensitize the municipal authorities to safety on the municipal road network;
- Evaluate the road safety methodologies and practices currently applied on the highway network and their implementation at the municipal level;
- Develop new, user-friendly road safety diagnostic methods, tailored to municipal realities;
- Experiment with a realistic partnership approach between the municipalities and the stakeholders concerned by road safety, at the regional level (participants to involve, role sharing, etc.);
- Produce a reference document accessible to all municipalities, eventually allowing similar concerted approaches to be carried out in every region of Québec.

Joint action was essential throughout the main phases of the pilot project. This is why this approach was prepared strategically, in order to identify the potential partners and establish joint action mechanisms at the beginning of the project. The partners thus were able to contribute, through their knowledge of the local and regional realities and through consultations at different stages of the project (Figure 2) to: 1) identification of the problems; 2) validation of the diagnosis; 3) development of proposed solutions and of the action plan.

Figure 2. Joint action mechanisms

Development of diagnosis – Development the action plan - Implementation of interventions



Source: L'AGENCE GÉOMATIQUE MONTRÉGÉRIENNE-GÉOMONT (1).

Identification of the potential partners meant targeting the local and regional bodies which, depending on their respective mission, expressed interest, assumed responsibility and showed a definite motivation to participate in this type of exercise. During the pilot project in MRC de Roussillon, the partnership was established on the basis of an existing regional table on traffic and safety, the Table régionale en circulation et en sécurité, headed by the Régie intermunicipale de police Roussillon. Regional stakeholders concerned about road safety were added to the members of this existing Table (representatives of the seven municipalities and RIPR personnel) (Figure 2).

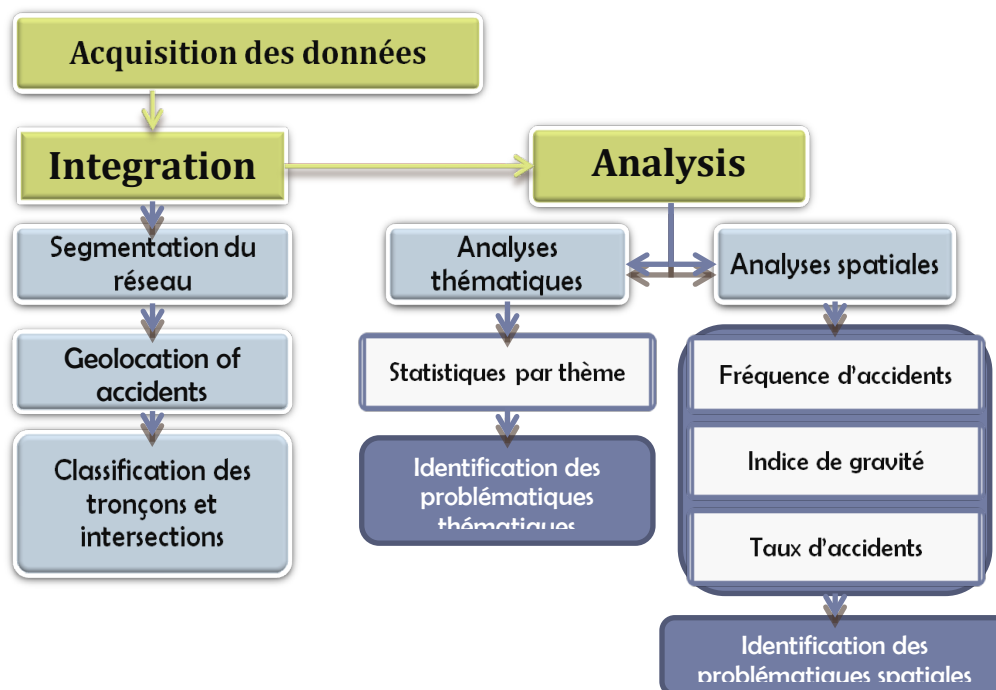
The establishment of the partnership was the first step of the road safety diagnosis, which was performed according to the following steps (see Figure 3):

- Data gathering (safety, traffic, road network, land use planning, contributions of the partners, etc.);
- Analysis of the data (development of a methodology);
- Identification of thematic and spatial problems.

A road safety diagnosis allows targeting of the problems identified in a given territory and determines the causes, so that action can be taken to reduce the number and severity of crashes on the municipal road network, while accounting for the general characteristics of the territory.

The core of the diagnosis consists of a detailed presentation of the data used and the thematic, spatial and in-depth analyses of the problems detected on the municipal road network.

Figure 3. The steps of the road safety diagnosis on the municipal road network



Source: L'AGENCE GÉOMATIQUE MONTÉRÉGIENNE-GÉOMONT (1)

Once the diagnosis is established, joint actions among the partners continued through the development of the action plan, which was articulated around the analysis of the thematic issues and of the sites where road safety problems were identified, in order to propose solutions in the different areas of action on road safety: improvement of road infrastructures, awareness and education, enforcement and regulation..

The highlights of the action plan's content are defined as follows:

- Analysis of the targeted problems;
- Production of proposed solutions;
- Identification of the partners' involvement;
- Support for implementation of solutions;
 - Inventory of financial assistance programs;
 - Intervention prioritization guide.

For each proposed solution, the person responsible for its implementation was identified and each partner involved (jointly responsible or associate) was specified, along with the implementation priority.

The performance of the diagnosis made it possible to define the following seven thematic problems: motorcyclists, moped drivers, pedestrians, cyclists, farm vehicles, collision with fixed objects, and management of urban development. In addition, 53 potentially problematic sites with a high crash frequency were targeted, i.e. 15 sections and 38 intersections. These sites show a crash rate higher than the critical rate, an above-average severity index and a crash frequency exceeding 4 crashes per intersection (in 5 years) or 4 crashes per 100 m (in 5 years) in the case of road sections.

At the outcome of the diagnostic exercise, 16 potentially problematic sites were prioritized and analyzed. Finally, the action plan includes 45 proposed solutions, corresponding to the 45 thematic problems, and proposed solutions for each of the 16 sites analyzed.

Beyond production of the final report, this pilot project led to several innovations:

- A municipal road safety diagnosis and action plan covering the municipal road network in the study area;
- A methodology tailored to the municipal network;
- Strengthening of the road safety partnership with the municipalities, the RIPR and other partners concerned by road safety.

The project also resulted in several lessons on collection of the necessary data, the quality of the data available, organization of the project and the competencies required, and establishment of a partnership likely to last when the action plan is implemented.

It should also be noted that the exercise performed under the pilot project focused on the crashes that occurred during the 2004-2008 period. Therefore, it is not exactly representative of the current situation, because a new section of Autoroute 30 has been opened in this geographic sector since then. The addition of this new freeway has altered mobility in the study area and the traffic and road safety conditions on the highway system and the municipal road networks.

At the end of the pilot project, a follow-up was done by the Ministère des Transports du Québec and the Régie intermunicipale de police Roussillon, to recognize the implementation of the proposed solutions identified in the action plan. A year and a half after the end of the project, discussions continue among the partners and led to the implementation of solutions in several areas of road safety on the municipal road network. For example, here are some concrete actions by different partners:

- Moped driver awareness campaign in the schools and technical inspection of mopeds (83 in June 2012) by the RIPR (42 warnings issued and letters to parents);
- Increased police surveillance of motorcyclists throughout the season;
- Adherence of the seven municipalities of MRC de Roussillon to the Société de l'assurance automobile du Québec pedestrian safety awareness campaign and control program, "bon pied, bon œil"² for 2012-2013 and 2014;
- Raising the awareness of young cyclists in the school by RIPR prevention officers;
- Raising the awareness of 1382 cyclists circulating in the study area on observance of the priority rules of the Highway Safety Code, between May 15 and September 15, 2012;
- Meeting with representatives of the Union des producteurs agricoles to learn about the road safety problems related farm vehicle traffic on the municipal road network;
- Maintenance, scanning and inspection of the municipal road network by certain municipalities to detect network anomalies that could hinder the stability of mopeds and motorcycles;
- Addition of pedestrian corridors on existing streets; when new streets are constructed, corridors are recommended to link different neighbourhoods;
- Exploratory walk to ensure the safety of routes taken by children to get to a school (new pedestrian crosswalk planned);
- Analysis of the addition of multipurpose lanes during highway rebuilding and new street construction.

3.2 Pilot project for a municipal road safety diagnosis and action plan within the territory of MRC d'Arthabaska

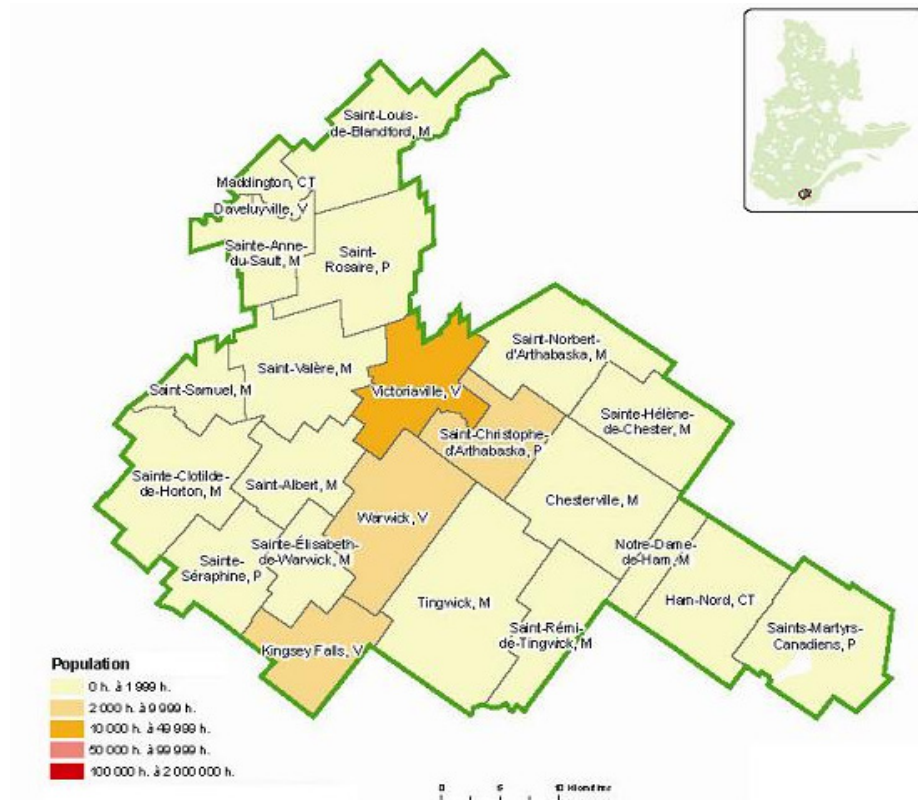
In view of the complexity of the approach carried out in MRC de Roussillon and the territory's particular conditions, mostly due to its location in the Greater Montréal metropolitan area, it appeared necessary to conduct another pilot project, offering different and complementary conditions that would allow refinement of the municipal road safety diagnosis and action plan approach in conjunction with the partners.

The study area chosen is MRC d'Arthabaska in the Centre-du-Québec region on the south shore of the St. Lawrence River. This is a regional county municipality located midway between Montréal and Québec. It contains 23 municipalities, most of them rural, with the presence of periurban and urban environments. Funded by the Ministère des Transports, the project began in April 2012 for a 2-year period and was entrusted to a multidisciplinary university research team codirected by the École Polytechnique de Montréal and INRS-Urbanisation.

² This awareness campaign is addressed to pedestrians and drivers, inviting them to adopt safe and mutually respectful behaviour at intersections and crosswalks. Intersections with a greater risk of conflict between users are targeted in each of the 7 municipalities.

The study area offers a diversity of geographic settings, with mountainous and hilly areas and flat landscapes. The MRC consists of a city centre, Victoriaville, with 43,160 inhabitants (nearly two third of the MRC's population). The 23 municipalities of the MRC are served by the Arthabaska Sureté du Québec (SQ) police station.

Figure 4. Study area of MRC d'Arthabaska



Source: Ministère des affaires municipales et des régions, online directory of municipalities, 2012, <http://www.mamrot.gouv.qc.ca/repertoire-des-municipalites/fiche/mrc/390/>

For this second pilot project, the following specific objectives are added to the initial objectives of the first project:

- Verify the applicability and user-friendliness of the method developed under the first pilot project and, if needed, propose innovative solutions to respond to the problems that had been raised;
- Relate the problems on the municipal road network more closely to the problems on the highway network;
- Experiment with a partnership approach allowing mobilization of a larger group of municipalities.

In the absence of an existing concerted action table bringing together all the representatives of the 23 municipalities, the project implementation team preferred the establishment of an advisory committee formed at the beginning of the project, so that the partners appropriate the diagnosis and the action plan that will be produced.

The concerted approach preferred in this second project is close to the one proposed in the *Guide méthodologique d'élaboration d'un Plan d'intervention de sécurité routière en milieu municipal* (Methodological guide to development of a municipal road safety intervention plan) (4), prepared by the Ministère des Transports du Québec, in preferring a joint action mode tailored to the study area.

Joint action will take different forms:

- Planning of focus groups;
- Planning of semi-guided interviews.

With the assistance of the MRC and partners already involved in the pilot project, a list of local and regional bodies concerned by road safety was created for the establishment of the advisory committee.

In addition to the support from MRC d'Arthabaska, the Sûreté du Québec police station, the Direction de santé publique Mauricie-Centre-du-Québec and Société de l'assurance automobile du Québec, the partners were recruited from the following bodies:

- The municipalities of the study area;
- The public transit and adapted transportation services;
- The school board's school transportation services;
- The bodies supporting recreational tourism activities;
- The bodies representing persons with disabilities;
- Any other body concerned by road safety.

The role of the advisory committee was defined by the research team as follows:

1. Contribute the knowledge indispensable to the diagnosis, particularly by specifying the concerns related to road safety, the thematic and spatial problems experienced, the potential constraints of certain users of the municipal road network, the interventions already performed;
2. Validate the prepared thematic and special analyses;
3. Contribute ad hoc support to the performance of in-depth studies within the territory, by validating the potentially problematic sites identified during processing of the data;
4. Validate the action plan, by establishing consensus on the main orientations and the follow-up to be provided.

This advisory committee will meet before, during and after the road safety diagnosis to establish a consensus on the main problems, validation of the diagnosis and prioritization of proposed interventions in an action plan.

In fall 2012 and winter 2013, a series of interviews was held with the different targeted stakeholders, which corresponds to the first consultation stage with a view to production of the diagnosis to complete the picture obtained by the analyses of crashes statistics.

Subsequently, the production of a preliminary road safety diagnosis began, ending in spring 2013. Following this stage, a new consultation of the partners is anticipated in the form of focus groups, supported by the first diagnostic results and the use of user-friendly mapping support to allow all the partners to give their point of view.

4. Financial assistance

As mentioned by the Table québécoise de la sécurité routière in its report of recommendations, the limited resources available to certain municipalities do not always allow them to set ambitious objectives regarding road safety interventions. The associated costs may be high. This is the perspective in which financial assistance to the municipalities was recommended.

4.1 Improvement work on the municipal road network

Several programs are already deployed to assist municipalities financially in performing improvement work on the road network under their responsibility. These programs can fund interventions mainly intended to improve road safety, as well as interventions that originated from other objectives, but into which road safety concerns were integrated, or interventions aimed at the rehabilitation, on certain conditions, of streets on which aqueduct or sewer repairs have been done.

The programs currently in force are managed either by the Ministère des Affaires municipales, des régions et de l'occupation du territoire (Québec-Municipalities Infrastructure Program, Programme de la taxe sur l'essence et de la contribution du Québec 2010-2013 (2010-2013 Gas Tax and Québec Contribution Program)), or by the Ministère des Transports (Programme d'aide à l'amélioration du réseau routier municipal (Program to support the improvement of the municipal road network)).

Taking note of the growing needs regarding municipal roads, the Government has also concluded that it is necessary to update and improve financial assistance for the local road network (2), and has initiated negotiations with the municipal partners within the context of the renewal of the 2007-2013 Fiscal Pact.

Finally, in its 2012-2013 budget, the Gouvernement du Québec announced immediate measures to support the municipalities, including disbursement to the regional county municipalities (MRCs) of \$9 million over two years (2012-2014) to plan the work needs on the municipal road network. Concerning planning of the work for improvement of road safety, the new program is the Plan d'intervention de sécurité routière en milieu municipal (Municipal road safety intervention plan).

4.2 Plan d'intervention de sécurité routière en milieu municipal (PISRMM – Municipal road safety intervention plan)



Launched in September 2012, the Plan d'intervention de sécurité routière en milieu municipal (PISRMM – Municipal road safety intervention plan) program is a new component of the Programme d'aide à l'amélioration du réseau routier municipal (Program to support the improvement of the municipal road network). It was deployed to support the municipal bodies in planning the most effective interventions on the local road network to improve road safety in their territory.

The PISRMM addresses the regional county municipalities (MRC), the agglomerations, the municipalities exercising MRC powers, and cities of more than 100,000 inhabitants. It allows funding of up to 100% of the fulfillment of a road safety intervention plan on the municipal network.

A road safety intervention plan consists of a diagnosis and an action plan. The diagnosis targets the main problems in the study area and determines the causes so that actions can be taken to reduce the number and severity of crashes on the municipal road network, while accounting for the general characteristics of the territory. The road safety diagnosis is structured according to the following main parts:

- the general characteristics of the study area and its evolution;
- the thematic problems;
- the spatial problems.

The action plan describes the most effective solutions to be implemented to correct each of the thematic problems and each problematic site analyzed. These solutions may apply to the different areas of action on road safety: improvement of road infrastructures, raising awareness and education, enforcement and regulation.

Joint action is also an essential step for the development of the diagnosis and the action plan, and for its implementation. The partners will contribute their knowledge of the local and regional realities through consultations at different stages.

The eligible bodies can refer to the *Guide méthodologique d'élaboration d'un Plan d'intervention de sécurité routière en milieu municipal* (Methodological guide to development of a municipal road safety intervention plan) (4), developed from the experience acquired during the pilot project conducted in the territory of MRC de Roussillon.

The Plan d'intervention de sécurité routière en milieu municipal (Municipal road safety intervention plan) offers the municipalities the opportunity to contribute to improve the road safety record on their network, by producing a road safety diagnosis and action plan that will

become indispensable supports for the sustainable establishment of a concerted action approach to road safety on a local and regional scale.

A status report will be presented at the Conference.

5. Conclusion

In Québec, the municipal network represents three quarters of the length of the province's road network, and accounts for more than half of the injury crashes. A substantial reduction of the number and severity of crashes cannot be achieved without an improvement of the municipal road safety record. The municipalities thus play a major role in road safety.

The reduction of the number of crashes on the municipal road network depends first on a better knowledge of the problems, based on the production of diagnoses, and second on the production of action plans with the aim of optimizing the investments to be realized, by targeting the main problems and the most effective solutions to solve them. Financial assistance has been available for this purpose since 2012. The local and regional municipalities then will be able to implement these action plans, by resorting to the financial assistance programs currently in existence and under review.

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