

**SUPPLY CHAIN INNOVATION AS A KEY DRIVER
OF PRODUCTIVITY AND COMPETITIVENESS**

EXECUTIVE SUMMARY

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**Logistics:
A key issue for productivity**

The productivity level of Québec businesses is lagging behind that of the province's primary economic partners. According to experts, this weaker performance can be attributed primarily to the services industry, specifically to the wholesale, transportation, and warehousing sectors at the core of the supply chain.

However, supply chain innovation is rarely considered as a means to help catch up, no doubt because its impact on productivity is underestimated. Yet it is a known fact that most world-class companies who have posted good results in recent years owe their success in large part to the strategic reconfiguration of their supply chains. Logistics lies at the heart of economic activity and is a key factor for improving efficacy and efficiency in all sectors.

It is this position statement's contention that businesses need to employ an approach that relies on logistics as a lever to boost productivity. Québec's productivity gaps can be closed only by taking an approach that is more attuned to recent developments in the supply chain, as companies in different sectors have become increasingly interdependent.

Position statement objective

This position statement illustrates how supply chain innovation can affect company performance and the global economy, taking into consideration environmental impacts such as congestion, energy consumption, greenhouse gas (GHG) production, and the destruction of infrastructures and natural habitats. The concern for both economic and environmental issues makes this a unique course of action.

The objective of the position statement is to encourage Québec companies in manufacturing, wholesale, and retail industries to deploy innovative logistics practices that can improve their competitiveness and productivity.

Logistics: A two-pronged issue

Logistics involves more than mere cost cutting; it represents a strategic vision that aims for heightened productivity in increasingly competitive markets. It is a tool both to help companies foster competitiveness and develop new markets.

**Logistics: A major opportunity
for organizational and technological innovation**

Logistics refers to all management and organizational activities involving physical and information flow within a company and between the company and its partners. Logistics endeavors to coordinate supply, production, and distribution activities. Transport is an essential aspect of logistics, but it also includes supply and demand planning, order entry processing and fulfillment, production planning, materials handling, product labelling, packaging, assembly and kitting, shipment consolidation, warehousing, relationships with suppliers, customers and third-party providers, customs clearance and brokerage, forwarding, fleet management, inventory management, reverse logistics, and more.

**A number of factors contributed to making
logistics increasingly important to businesses**

- *Globalization of business activities*

The globalization of markets and supply sources, low fuel prices and innovations like the emergence of containers and refinement of information technologies have spurred companies to outsource work to low-cost countries—a practice called offshoring—in order to gain a competitive edge, further complexifying the supply chain.

- *Increasing company interdependence*

With strong competition emerging throughout the world, some companies have joined with their peers to integrate business activities and achieve shared operating savings, which results in greater interdependence. This affects the supply chain, as production and distribution are no longer subject to single-firm activity, but are increasingly practiced in networks of suppliers and sub-contractors.

- *Reconfiguration of supply chain networks*

Global supply chains have also been affected by mergers and acquisitions that have reconfigured supply chain networks.

- *Production fragmentation and just-in-time strategies*

Production fragmentation added additional linkages to the supply chain and made transport a more critical part of the production and distribution processes.

Just-in-time and mass-customization production strategies have exacerbated time constraints when it comes to delivering product to customers.

Greater coordination and more follow-up—whether of information or goods—become necessary for optimal management of the resulting flows.

- *Increased worldwide competitiveness*

In a highly competitive global economy, companies cannot be content to simply produce goods at a lower cost than their competitors. They must find other ways of improving their performance and ensuring that they remain competitive. Logistics can play a major role here, resulting in better operational integration within organizations and improved coordination and planning, along with gains in transport efficiency. In this respect, logistics should serve as a strong base for any strategic vision.

- *Substantial energy and environmental pressures*

The demand for sustainably produced goods and increased transport (production fragmentation, smaller shipment sizes, increased frequency of deliveries, returns processing, and recycling) has spawned a host of energy and environmental concerns that are prompting companies to explore logistics, in search of possible gains. Large companies that have recently implemented measures to “green the supply chain” are also finding that these actions lead to productivity and efficiency gains.

- *High logistical costs*

Logistics costs are not inconsiderable: in developed countries, they represent between 10 and 13% of GDP.

Supply chain optimization: A strategy that can unleash productivity gains

Supply chain innovation can do more than just help control costs. It can also

- Optimize supply and distribution networks
- Promote better synchronization of various stages in the chain
- Facilitate optimal utilization of production capacities
- Improve response to increasingly complex customer requirements
- Reduce turnaround
- Help mitigate risk (delays and out-of-stock situations)
- Reduce waste and environmental impacts

- Promote better competition management

World-class companies that are current category leaders owe their success in large part to the strategic reconfiguration of their supply chains. Innovation in logistics processes enables them to meet reliability, flexibility, and rapidity requirements while reducing their costs and dealing with environmental pressures. Logistics operations not only generate savings, but also endeavor to create value by developing and implementing new business models. Here are several examples:

- *More proactive customer relationship management*

The Internet makes it possible to 1) improve coordination in the production and communications processes with suppliers and customers, 2) optimize supply sources, and 3) expand a company's presence in the market. The Web isn't simply a "virtual window" where products can be displayed. It also gives companies a way to analyze shopping behavior and anticipate, or even shape, customers' future needs or desires by comparing groups of similar consumers using sophisticated algorithms. This strategy is used successfully by *Amazon*, which periodically suggests to its customers books, CDs, or films that have appealed to like-minded consumers.

- *Process reengineering*

Continuous replenishment and supply chain agility are reengineering practices adopted successfully by *Dell*. After consumers submit their specifications by phone or Internet, *Dell* is able to offer them a vast variety of computers, with countless combinations of components, with extremely quick turnaround and no warehousing required. In 2005, *Dell* assembled 100,000 computers per day with only two hours of inventory in each plant and three days of inventory in its entire organization. Its suppliers have 90 minutes to deliver components by truck to the assembly line.

- *Enhanced supply chain collaboration*

A number of collaborative practices are used to better meet consumer needs, share risks, or improve forecasts. This is the case with continuous replenishment practices, which involve partnerships between distribution network members so as to better plan the restocking of retail stores based on point of sale information and forecasts developed by network members. This approach, coupled with a just-in-time strategy, allows *Zara* to quickly react to fluctuating demand and frequently replenish its store inventories. Using this strategy, *Zara* deliberately produces its garments in small batches. in Spain, which helps shorten the design-to-sale cycle, reduce scarcity costs and seasonal markdowns while creating a sense of newness and scarcity value that helps boost sales.

- *Strengthening resilience Green logistics*

Companies are more vulnerable to various risks that can affect their product lines as supply chains lengthen and become more complex creating greater business interdependence, including procurement issues in politically unstable countries, increased customer demands, a proliferation of products, and even short product life cycles. Late deliveries, unexpected inventory shortages, and poor quality products constitute potentially damaging situations that can compromise company competitiveness.

The quickness with which a company anticipates and manages crises gives it a competitive advantage that can have long-lasting effects. This was the case with *Nokia*. In 2000, *Nokia*—unlike its competitor *Ericsson*—was able to make up for an inventory shortage at *Philips*, its semiconductor supplier, because it contacted other manufacturers during the unexpected delay and also worked directly with *Philips* to resolve the problem. *Ericsson*, which did not manage the situation proactively, missed the opportunity to introduce a new product to the market, resulting in estimated losses of \$US400 million. *Ericsson* subsequently decided to quit making handsets on its own.

- *Green logistics*

In order to increase energy efficiency and reduce dependence on fossil fuels, *FedEx*, with a fleet of 700 aircraft and 44,000 motorized vehicles that consume 4 million gallons of fuel a day, decided—despite the global slowdown—to replace its older planes with Boeing 757s, allowing it to slash fuel consumption by 36% and increase aircraft capacity by 20%. In addition, the company has set up solar-energy systems at its distribution hubs in California and Cologne, Germany. It uses hybrid vans that are 42% more fuel efficient than conventional trucks and has replaced more than 25% of its fleet with smaller, more fuel-efficient vehicles. *FedEx* has also parlayed its energy-saving expertise into a stand-alone consulting business in this niche.

**Innovative logistics practices
lead to gains for Québec companies**

- *Savvy use of IT optimizes the production process*

Lambton Doors, North America's sixth largest producer of doors for institutional use, adopted radio-frequency identification technology two years ago to optimize its overall production process. An RFID tag inserted in each door allows production lots to be tracked on a unit basis within the plant until they are loaded on trucks for delivery. With Lambton manufacturing to individual requirements, production equipment reads each RFID tag and automatically adjusts to produce a door that accurately meets the

specifications. The company, which manufactures approximately 800 doors a day, also uses this technology to manage space in its plant, which may house as many as 10,000 doors at a time. RFID tags also make it possible to locate a particular door in a lot, if necessary. And the technology lets Lambton completely automate data management so that an instantaneous overview of production status is available. With neither inventory nor a warehouse, Lambton manufactures to order and delivers directly to worksites using the services of a logistics provider that handles transport. The company recently delivered 1,100 doors to the Marriott Hotel in Montreal. Approximately 70% of the 180,000 doors that Lambton produces each year are for export.

- *Ecodesign, at the heart of energy and material savings*

Bain Ultra, a bathtub and home spa manufacturer located in Saint-Nicolas, on the outskirts of Québec City, sought to reduce the cost of turbines used in its air jet massage tubs. Development of a new turbine to optimize air flow meant that noise and energy consumption could be reduced 15%, resulting in 750 fewer kilograms of GHGs being emitted during the product's useful life, estimated at 20 years. With fewer parts and fewer welding seams, the new turbine is easier to assemble and disassemble; by reducing its assembly components 30% and its mass 50%, it can be stocked, installed, and maintained for less. In addition, the new turbine has a longer life expectancy than its predecessor, as noted by the Institut de développement de produits.

- *Expanded production—without increased energy consumption*

Cascades recently consolidated its computer resources and replaced employee work stations with more energy-efficient equipment, slashing its data-related electric bill 85%. Seventy servers located at the company's North American plants and offices were replaced by virtual servers at data processing centers in Kingsey Falls and Candiac. These two locations are now home to systems known as blade servers, which together can hold more data than all 70 of the older servers. And while the previous servers used as much as 21,000 watts, the new system makes do with less than 3,000 watts.

As data centers consolidate, traditional computers, with hard drives and local applications, are becoming a thing of the past; with formerly local apps now residing on virtual machines, today's employee needs just a keyboard, mouse, and flat screen. And where a traditional computer used between 100 and 200 watts of electricity, today's terminal requires 2 to 15 watts. This means that the company can expand production without increasing its total energy consumption. It also reduces the amount of obsolete equipment sent for recycling or to landfills.

**Changes on the global economic and political stages
signify major challenges for logistics**

- *Energy and raw material price increases*

Once the economic slowdown ends, fuel and raw material prices should be on the rise again, if for no reason other than strong demand from emerging nations. The domestic markets of such countries will expand, widening trade between Asian nations, while trade with developed nations will also continue to grow. Companies will find it in their best interests to make production more efficient, thereby reducing costs, transportation requirements, and even production and distribution timeframes.

Itinerary optimization, aided by intelligent transportation systems, will become more important.

Land planning issues will become crucial: regions must distinguish themselves by emphasizing the value-added services they offer, accentuating their positive business climates and the infrastructure (in the form of ports, airports, logistic hubs, free trade zones, highways, and railways) that will let companies serve ready-made consumer populations.

- *Increased environmental pressures*

Environmental pressures should intensify due to increased energy prices, product sustainability requirements, pressure on infrastructures, and government commitments to address increasing GHG emissions. Regulation in these areas is expected to intensify. Many companies have already implemented green logistic measures, and this trend will grow.

Intermodality, which is being turned to increasingly to lessen transport-related energy costs and avoid road congestion, should also help reduce congestion.

The contradictions between business productivity and sustainable development will diminish. Many leading companies have already experienced success combining supply chain optimization and sustainability. Early adopters are most likely to derive a competitive edge from doing so.

- *Logistics choices and city logistics: a difficult balance to strike*

This is a level where existing contradictions could be exacerbated. Just-in-time production practices and reduction of warehousing hubs mean that more transport is required, thereby aggravating road congestion.

As for e-commerce, greater numbers of home deliveries and returns are driving up the “cost of the last mile,” leading to greater interest in *last mile logistics*.

Increased demand for urban and environmental planning will also mean there is a larger role to be played by city logistics, to meet the mobility and accessibility needs of people and goods.

- *Changes in buying and consumption habits*

Buying and consumption habits are evolving towards a more active participation of customers. This is translating into greater reliance on e-commerce, products that are personalized on the basis of buyer preferences, and even collaboration with customers in the design of new products. Companies that have elected to manage customer relations more proactively are already reaping significant benefits.

The trend of associating services with sold products will continue to develop: the service economy—as opposed to the product economy—is increasingly attuned to environmental concerns and enhances customer loyalty.

- *Supply chain complexification*

The growing complexity of supply chains and their greater vulnerability to potential stock disruptions accentuate the need for product traceability and dynamic tracking systems. Environmental concerns also make better traceability a must, if only to verify that products are inherently sustainable or to ensure their recovery and recycling at the end of their useful lives. Product traceability also makes it possible to meet requests to postpone or expedite delivery.

This complexity requires greater cooperation with various supply chain partners, both down- and upstream, so as to result in the best possible integration.

- *Heightened concern about safety questions*

As global supply chains become more complex, vulnerability to international political and economic disruptions is increasing. This also justifies standardized rules and strict measures to ensure that consumer products are safe and that appropriate guidelines are defined for the transport of hazardous materials. Here again, there is a need for traceability. Greater attention must be paid to risk management.

The threat of terrorist attacks has lead numerous countries to institute counter-threat measures that are likely to complicate customs formalities and slow truck traffic at borders, which will have an impact on the flow of goods. Logistics will need to address this situation in order to avoid delays, chain disruptions, and price increases. Intermodality is one of the solutions to this problem.

Some challenges are unique to Québec

- *Business expansion linked to penetration of foreign markets*

The modest size of Québec's population is an incentive to seek inroads in foreign markets, in order to ensure business expansion.

- *A highly competitive environment*

The voracity of American mega-companies means that imagination and competitiveness are a must if players are to carve out a place in local and/or foreign markets—especially as the Canadian dollar approaches parity with the U.S. greenback.

- *Geography that drives transportation costs up*

Mobility-related costs are very high given Québec's vast size, low population density, and extreme seasonal climate variations, which makes infrastructure more vulnerable.

Québec's dependence on foreign fossil fuel supply sources and its remoteness from North America's major population centers also add to its vulnerability.

But Québec also benefits from several geographic advantages

It serves as a transportation gateway between other provinces, the United States, and Europe.

Its proximity to the U.S. market makes it an attractive location for companies wishing to offer on-demand production with short delivery turnarounds.

Québec's substantial navigable waterways make short-distance modal transfer a transport option within the province.

Its extensive coastal zone is ideal for international sea trade—which may, however, require a review of port facility handling capacities.

Significant railway infrastructure also provide tangible possibilities for intermodality.

An assessment of logistics in Québec

- *An absence of Québec data*

Very little Québec data is available, be it large-scale studies on company supply chains or statistics on the transportation of goods that could help optimize city logistics. Few performance indicators have been developed. Moreover, there is not much in the way of an integrated government vision of logistics.

- *A wide gap between academic expertise and business expertise*

A great deal of supply chain expertise can be found within Québec research centers and universities, as well as third-party logistics providers. Extensive training is also available at the college and university levels. But the transfer of knowledge to business is lacking.

Québec companies, when compared to their American and European counterparts, are significantly behind when it comes to logistics, whether in terms of outsourcing to the logistics service industry, adopting information technologies and e-commerce, communicating with various supply chain stakeholders, diversifying export markets, managing risk, relying on intermodality, or hiring internal logistics specialists. The gap is even more pronounced in small companies. In addition, businesses are often unaware of their overall supply chain costs.

- *Underuse of information technologies*

While information technology use may be closely correlated with company productivity and enable better supply chain coordination, the integration of IT tools into the work processes of Québec companies leaves much to be desired, in terms of e-commerce as well as process computerization and new collaborative applications. They have been particularly slow to adopt software packages and electronic traceability tools such as radio frequency identification.

Despite high Internet use rates, Web potential is being underutilized; among companies with websites, there are relatively few adherents for numerous business functionalities. U.S. companies use 30% more electronic technology than their Canadian counterparts. In 2009, more than half of Québec SMEs still did not have an in-house IT specialist.

- *Supply chain integration and outsourcing also lag behind*

The growing supply chain complexity brings about companies to turn management of logistical activities over to third-party providers who have advanced expertise, in order to concentrate on their core competencies. Subcontracting allows better process integration

as specialized logistics providers—with their global, strategic vision of what is happening in the overall supply chain—are often better equipped to manage flows.

Despite the benefits that could be gained, companies in Québec and elsewhere in Canada lag significantly behind the irreversible international trend to outsource logistics operations; those companies that have taken the first steps have reduced their supply chain management costs and increased their sales. Transportation and warehousing are the areas most often outsourced, but this is more a matter of operational collaboration than strategy; in other words, the service is subcontracted, but not its management.

- *Little reliance on intermodality*

While intermodality is seen as a solution for GHG emission increases, road congestion, and high energy costs, it is still not widely practiced by companies despite the existing infrastructure and recent government support programs. The inadequacy of rail transportation for moving goods and just-in-time production and distribution practices are cited as impediments to intermodality. Nevertheless, increasing environmental pressures and city logistics constraints should continue to encourage a modal shift to more energy-efficient transportation that helps alleviate road congestion.

- *Green logistics not yet widely practiced*

With little documentation available on Québec, it appears that, across Canada, green supply chain management practices could be improved. In 2009, energy-efficiency measures were employed by 55% of companies in manufacturing and 45% of companies in retail. Other types of measures—such as reducing GHG emissions and waste, as well as product recycling and packaging—were being adopted at lesser rates. Reverse logistics capacities (for the recovery and recycling of products) were much less developed and efficient in Canada than in the U.S.

- *Lack of interest in logistics careers*

Despite the existence of numerous programs at the college and university levels, there is currently a shortage of qualified supply chain workers. The field is not succeeding in attracting enough candidates to fill open positions, and most of those who attend training programs hail from outside Québec. It seems that the discipline is not yet widely known and that the benefits associated with supply chain integration are not well understood. It is also difficult to fill certain types of positions, such as inventory manager, purchasing manager, supply chain specialist, warehouse personnel, and others.

- *Little integration of available support measures*

Numerous government support measures are currently available in Québec as well as at the federal level, but they have not been designed specifically to optimize the supply chain. Thus there are measures intended to increase business productivity and

competitiveness, as well as policies on energy efficiency and others meant to limit GHG emissions. Different entities are responsible for defining actions to be undertaken, based on desired outcomes, which may complicate the harmonization of measures to be implemented. There is no comprehensive vision of logistics and its key role in the economy.

Contrary to recent initiatives in various countries and regions—such as the European Union, Germany, Australia, Scotland, South Africa, and New Jersey—Québec still does not have an action plan to improve logistics and, thereby, business productivity.

- *Overlooked land management issues*

Logistics can also be a tool for regional development. The supply chain can serve to attract companies and logistics providers to given areas, promote intermodality, and carry out activities that add value and optimize the flow of goods.

Unlike many countries, Québec does not yet have a logistics hub or free-trade zone where supply chain activities could be concentrated, promoting better integration of operations and leading to economies of scale. There is no consensus yet on where to locate such infrastructure, and debate continues to pit regional interests against those of Québec as a whole.

Nor has Québec identified green corridors that would help meet environmental and safety requirements for the transportation of goods. Lastly, there seem to be no policies on itinerary optimization and on the elimination of potential conflicts between movements of people and goods.

In view of the major developments under way in places such as the U.S. (expanding port zones, establishing logistic hubs and free-trade zones, refurbishing rail transport infrastructure), Québec's inaction runs the risk of further compromising the ability of its firms to succeed in today's highly competitive world.

Recommendations

There is consensus that Québec companies need to increase their productivity. Logistics—a major opportunity for organizational and technological innovation—is acknowledged by productivity experts to be the most efficient lever to attain this objective and narrow the gap.

Faced with this urgent situation and the need to deal with current concerns over sustainable development, Québec must take a more universal approach to address its primary challenges and seize the development opportunities they create.

With its energy strategy, climate change action plan, and recent policies on the transportation of goods, Québec has placed the first milestones on the path that it will take into a greener future. A vision of the supply chain should be part of that journey. It would open up opportunities created by energy efficiency and GHG reduction initiatives, for instance, to involve the entire structure of the flow of goods, from the product design phase to end-of-life recycling. Green logistics offers a host of innovative ways to improve productivity.

The work of the steering committee and consultations held in the field have also pointed out the importance of communicating directly with companies and their associations, given their ability to make things happen in the realm of logistics.

Two major opportunities for action

Two types of actions must be taken. The first involves a series of measures that will directly help companies address their supply chain shortcomings (Recommendations 1 to 4). The second, equally critical, involves creating infrastructure that is conducive to the adoption of more efficient logistics practices (Recommendations 5 and 6).

General recommendation

The Government of Québec, particularly Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE), should formulate a systemic logistics vision and action plan

Decision-makers must recognize that the supply chain is a key factor of economic competitiveness and clarify Québec's vision with regard to logistics and transportation. This vision must provide a systemic, integrated approach that addresses in detail the roles of the various actors in government, industry, and academia. This plan should be subject to discussion, validation, and strategic options, within the context of a conference or

forum. This approach, under the aegis of MDEIE, should involve other ministries—such as Ministère des Transports du Québec (MTQ), Ministère des Affaires municipales, des Régions et de l'Occupation du territoire (MAMROT), and Ministère du Développement durable de l'Environnement et des Parcs (MDDEP)—that are also responsible for infrastructure, land management, and sustainable development.

Focused on supply chain optimization and addressing not only the manufacturing industry but also the corporate services sector, this action plan should emphasize the potential gains in terms of logistics efficiency and firms productivity. It should reconcile regional development objectives and logistical efficacy, in addition to integrating environmental imperatives.

The primary actions to be taken are covered in the following recommendations.

Specific recommendations

1. Ministère du Développement économique, de l'Innovation et de l'Exportation should implement measures to improve knowledge transfer so as to help Québec companies make up the leeway in logistics and productivity.

a. It is recommended that MDEIE, supported by university experts, establish relationships with business associations and their networks of experts (Québec's federation of boards of trade [FCCQ], Ministère de l'Éducation [MEQ], regional innovation hubs, industry associations) to disseminate case studies and best practices guides to their constituencies using as-yet-undetermined methods (forums, expert committees, etc.). The audience should not be limited to manufacturing companies, but should include logistics providers as well.

b. In the near future, MDEIE should also step up the development and dissemination of supply chain best practices, in order to help companies deal with logistics issues. This effort should be directed especially at SMEs, where the adoption of best practices is much slower.

c. In addition, Commission des partenaires du marché du travail should be invited to explore the possibility of offering ongoing logistics training that includes namely the greening the supply chain.

d. As there is no active intermediary in place to give SMEs access to best practices services and information, it is recommended that MDEIE explore the possibility of appointing an existing agency to handle liaison and the transfer, demonstration, and networking of expertise (including that of CCTTs [Centre collégial de transfert technologique] that deal with logistics), in keeping with the roles and strengths of each. The best entity to take on this responsibility appears to be CEFRIO [Centre francophone d'informatisation des organisations], given that it already plays a critical role in disseminating knowledge on the adoption of best

practices in information technology, a sector where Québec companies exhibit shortcomings. This intermediary organization would be tasked primarily with the following responsibilities:

- Support linkages between universities, logistics consultants, and business
- Facilitate the dissemination and appropriation of best supply chain practices
- Encourage companies to engage in supply chain assessments, and provide tools to be used in the process
- Promote the distribution of decision-making tools
- Carry out demonstration projects
- Identify industry supply chain workforce requirements and available support programs
- Provide a showcase for Québec supply chain innovation

2. Ministère du Développement économique, de l'Innovation et de l'Exportation and Ministère des Finances should adjust incentives to spur SMEs to improve their supply chain practices

Financial aid and coaching are effective ways to help and encourage companies to improve their practices and operations. In view of the essential contribution of supply chain practices to productivity, direct and indirect programs—including internships—must be adjusted to spur business and supply chain innovation and to provide an overarching approach to helping and coaching businesses, rather than piecemeal interventions. (For more on this topic, see the Conseil's recent publication, *Pour un financement performant de l'innovation dans les entreprises*). In addition, in order to better reflect current conditions in industry—where interdependence among companies exists across all sectors—these programs and measures must be made available to companies in the logistics, information services, and consulting sectors, which play a crucial role in supply chain optimization.

Lending institutions, which are the primary source of financing, should also be brought into the picture; in addition to making them aware of these efforts, they should be given the means to develop assessment mechanisms for loans to companies that wish to improve their supply chain processes.

3. Ministère du Développement économique, de l'Innovation et de l'Exportation should support more active inter-company and inter-association collaboration.

Given the modest size of most Québec companies, better inter-company collaboration—in the areas of transportation and warehousing, for instance—can foster economies of scale and increase supply chain efficiency. Similarly, greater collaboration among associations can improve supply chain operation and knowledge transfer. It is therefore recommended that:

- Business training programs cover these concerns and their beneficial effects
- Business associations be made directly aware of the beneficial effects of improved cooperation and encouraged to promote such efforts on their websites

4. The Government of Québec must do more to promote logistics careers to Québec students and to make companies aware of the importance of using such resources.

In view of the small number of Québec students that are attracted to logistics careers, and of the key role that the province's universities play in training foreign students in this discipline, it is important to develop incentive measures and promotional messages that will demythify logistics professions and attract more young Quebecers to this line of work. These measures should be developed in partnership with the industry, so as to meet its specific needs. It is therefore recommended that:

Incentive measures and messages that explain what logistics professionals do should be implemented to attract more young Quebecers to supply chain careers. These measures should be developed in partnership with educational institutions and industry.

Since industry underestimates the role of logistics as a growth lever for productivity, it is also important to

Make companies aware of the importance of having internal logistics competencies and recognizing the impact of the supply chain on business performance and competitiveness.

5. The Government of Québec, in making infrastructure-related decisions, must act with the goal of promoting logistics efficacy that benefits the province.

It is recommended that decisions regarding infrastructure development be based on province-wide needs, rather than regional or local needs, so as to better articulate the Québec development model in the global economic and industrial contexts.

Contradictions between regional development goals and logistics efficacy require balancing regional interests against the effectiveness of the supply chain. A particular region cannot be singled out if doing so consequently jeopardizes Québec's competitive stance in the North American market. This approach is consistent with the overall vision that Québec must adopt.

Providing tangible opportunities for stakeholders from specific areas to regroup will also encourage inter-company collaboration, consolidate flow, and reduce unnecessary transport, aiding both sustainable development and global competitiveness.

6. *The Government of Québec should carry to completion—without delay—its ongoing infrastructure initiatives that will bolster logistics operations.*

Specifically, it must act swiftly to finish the extension of Autoroute 30, complete and implement the intermodality policy announced two years ago, and follow up on feasibility studies for the creation of a logistics hub in Montérégie and initiatives for the Ontario–Québec Continental Gateway and Trade Corridor.