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Seizing the Continent:

Opportunities for a North American Gateway

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FOREWORD

CANADA'S ROLE AS A North American gateway to Asia is almost as old as Confederation. The transcontinental railway that made Canada from "sea to sea" was as much about facilitating trade between Asia and Europe as it was about a "national dream". George Stephen, the president of Canadian Pacific Railway wrote to Prime Minister John A MacDonald in 1885 with the view that "the Canadian Pacific is not completed until we have an ocean connection with Japan and China". When the ocean connection was made, trans-Pacific trade flourished and Canada became an important transportation route for the shipment of silk, tea, oranges, and Royal Mail.

In the many decades that followed, Canada's west coast ports diminished in importance, due in part to changes in transportation technology, the shortening of sea routes, shifts in economic power and global manufacturing, and war. It was not until the beginning of this century that Canada's role as a North American gateway was rediscovered, largely because of the massive expansion of trade between Asia and North America. Congestion in US ports provided an opportunity for Canadian facilities to capture market share, building on the long-recognized geographic advantage of Canada's proximity to key Asian ports. This effort took flight in 2005 when Ottawa and the BC government launched the first of its Asia Pacific gateway initiatives, which led to the expansion of port (and airport) capacity, improvements in road and rail infrastructure, and the streamlining of customs and regulatory procedures for the movement of goods and people.

The Asia Pacific Gateway and Corridors Initiative (APCGI) has already resulted in a significant increase in container traffic through west coast ports, and has firmly established Canada as a serious alternative for shipments from Asia to the United States. Even so, Canada's market share of Asia-North American container traffic is around five percent only, and there is much potential for Canadian ports—on both coasts—to capture a larger slice of the market.

I am delighted therefore by the release of *Seizing the Continent—The Great North American Gateway*, prepared by George Stalk, Senior Fellow at the Foundation and Senior Advisor of The Boston Consulting Group; and Dr. Charles McMillan, Professor of International Business at York University and a former director of the Foundation. The authors believe that the huge growth potential of Canada's North American Gateway will depend on key players in industry and government working together to develop a collaborative business model to increase efficiencies across the entire supply chain.

As Canada places more attention on economic ties with Asia, one of the immediate opportunities for Canadian industry will be in the area of transportation, logistics, and supply-chain related services. Building a North American Gateway with deep collaboration among stakeholders, as proposed by the authors, will be an important step in realizing these opportunities.

The Asia Pacific Foundation of Canada has had a long history of involvement in Asia Pacific gateway research and convening, going back to the Asia Pacific Trade and Transportation Forum and the creation of the Greater Vancouver Gateway Council in the early 90s—which led to the current APCGI. This latest contribution by Stalk and McMillan is an important advance in thinking on the importance of the gateway, not just for the west coast but for all of Canada. I commend the authors on the report and look forward to working with them to advance their ideas.

Sincerely,

Yuen Pau WOO
President and CEO,
Asia Pacific Foundation of Canada

EXECUTIVE SUMMARY

AS YOU READ THIS, Canada is a front-row player in the rapid evolution of the globalized world economy. Not since Prime Minister John Diefenbaker found terms of agreement with U.S. President Dwight Eisenhower in the 1950s to create the St. Lawrence Seaway, or since Brian Mulroney and Ronald Reagan made free trade between the two countries a reality, have Canadians had the opportunity to take centre stage in globalization.

Today, Canada has the physical infrastructure (ports, railroads, and highways), corporate talent, and government leadership to create a North American Gateway (NAG) for the timely, reliable, and cost-effective flow of goods from Asia and Europe into and out of central North America. If Canada can establish the NAG, thousands of jobs will be generated both here and in the United States. This job-creation potential from an increase in exports resulting from easier and cheaper transportation of goods to export markets is difficult to estimate but potentially large and clearly a bonus. Canadian and U.S. consumers will definitely benefit from the lower cost of delivered goods, because logistics cost can be as much as 30 percent of the retail price consumers pay.

Realizing this opportunity requires increased management talent rather than more monetary capital. Canada has the port (Prince Rupert) and rail capacity to take a continental leadership role in easing the flow of containers (and bulk) into central North America.

To adequate physical capacity must be added the creation of a collaborative platform to enable users and suppliers of logistic services to cooperate in accessing Canadian infrastructure effectively and efficiently for the movement of containers. If the collaborative platform is successful, Canada will experience a dramatic increase in North America's share of the movement of container and bulk goods. Railroads and ports like Prince Rupert will soon need to expand capacity as more and more end users and liner companies choose—because of reliability, speed, and value—to move their goods though Canada rather than the United States.

The collaborative platform is best thought of as a service company owned by key players—users and providers—in the Asian, European, and North American supply chain. The platform makes critical information needed for effective and efficient management of the supply chain available to owners and subscribers across all segments. The collaborative platform is a tool whose users differentiate themselves in their ability to utilize it effectively, but it does guarantee parity or advantaged performance .

The profit-seeking implications of a successful NAG and of the collaborative platform are enormous. However, realizing these profits is challenging:

- Today's players are focused on optimizing their performance within their segment of the supply chain. The benefits of collaborating are a hard sell to a company whose management is already very busy doing what it controls.
- Investments needed to dramatically improve end-to-end (or system) performance may result in a mismatch of monies invested in a segment of the supply chain and another segment that actually enjoys the benefit of the investment.

EXECUTIVE SUMMARY (CONT.)

- No forum exists that readily brings the users and suppliers of the North American supply chain together to discuss making NAG a reality—hence, one is needed.
- Because the overall benefits accrue from systemwide performance improvements, the system needs a highly respected and energetic leader to push the changes needed.

What we call the NAG already exists today as part of a slow evolution in which end users and liner companies are attracted to Canadian ports and railway access to central North America. Various Canadian gateway initiatives—most notably the Pacific and Atlantic Gateways—are nascent efforts to bring elements of the local supply chain into stronger collaboration. What we envision is a revolutionary, step-function increase in volumes flowing into and out of Canada as the collaborative platform enables the integration of users and players in the supply chain and heightens reliability, increases speed, and lowers delivered costs. The NAG we foresee is both a national and an international venture, with tentacles stretching from Asia, Europe, and Canada and across the United States.

The NAG has immense possibilities for Canada. Companies along the global supply chain—exporters, manufacturers, retailers, shippers, terminal operators, ocean ports, airport authorities, railways, trucking firms, and senior transportation officials at the federal, provincial, and municipal levels—understand that being ahead of the competition gives Canada an edge. U.S. logistics gridlock is real, and even with the best of intentions in the political realm, it cannot be solved quickly. This is Canada's opportunity. In practical terms, it requires a clear understanding of the importance of Canada's trade position, the need to link transportation issues with trade flows, and the necessity to position Canada for future developments in overseas markets, especially with the likelihood of new free-trade arrangements with the European Union, Japan, and the Trans-Pacific Partnership in Asia.

Although individually all key players have signed on intellectually, few are ready to join in developing a collaborative effort to make NAG a competitively advantaged reality. Canada's various gateway initiatives, numerous consultation meetings, industry conferences, and trade shows, plus academic, industry, and government studies, have produced a widespread national consensus on the opportunities, challenges, and impacts for Canada: job creation, strengthened companies, incremental but important rebuilding of Canadian infrastructure, and sustained and ongoing improvements in U.S.-Canada border security, tools for advance screening, and tools to aid law enforcement agencies.

What Canada at large—both public and private sectors—faces, and what policymakers increasingly understand, is how Canadian industry must fit into global trade and transportation supply chains. Global trade and global logistics are realities. Canada needs to invest in a three-way national strategy to link the Pacific coast ports, the Atlantic coast ports, and the St. Lawrence–Great Lakes corridor. But any such initiatives require a massive educational process in both the public and private sectors, showing Canadians why the country intends to be a global player in international trade and is willing to invest the time and money to design a transportation system that has the global reach to create jobs tomorrow. The intention of this report is to expedite that education process.

THE NORTH AMERICAN GATEWAY: A Quick Summary

CANADA IS A FRONT-ROW PLAYER in the rapid evolution of the globalized world economy. Not since Prime Minister John Diefenbaker found terms of agreement with U.S. President Dwight Eisenhower in the 1950s to create the St. Lawrence Seaway, or since Brian Mulroney and Ronald Reagan made free trade between the two countries a reality, have Canadians had the opportunity to take centre stage in globalization.

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LA PORTE DE L'AMÉRIQUE DU NORD : UN BREF RÉSUMÉ

LE CANADA JOUE UN RÔLE DE TOUT PREMIER plan dans ce processus en évolution rapide qu'est la mondialisation de l'économie. C'est la première fois depuis l'accord conclu par le premier ministre John Diefenbaker et le président des États-Unis Dwight Eisenhower pour créer la Voie maritime du Saint-Laurent dans les années 1950, ou encore depuis que Brian Mulroney et Ronald Reagan ont donné corps au libre-échange entre les deux pays que les Canadiens ont l'occasion de montrer la voie en matière de mondialisation.

Aujourd'hui, le Canada dispose des infrastructures physiques (ports, voies ferrées, routes), des cadres de talent et du leadership gouvernemental nécessaires pour créer une Porte de l'Amérique du Nord (PAN) en vue de favoriser le mouvement rapide, fiable et économique des marchandises d'Asie et d'Europe vers le centre de l'Amérique du Nord et vice versa. Si la PAN se matérialise, des milliers d'emplois seront créés au Canada comme aux États-Unis. Alors qu'il est difficile d'estimer le potentiel de création d'emplois engendré par l'augmentation des exportations lorsque le transport international de marchandises prend moins de temps, d'efforts et d'argent, il s'agit d'un potentiel important et incontestablement d'un avantage. Les consommateurs canadiens et américains bénéficieront sans doute de la baisse du coût de livraison des marchandises, étant donné que les frais de logistique peuvent représenter jusqu'à 30 pour cent du prix de détail des produits.

Pour profiter de cette occasion, il importe de disposer de davantage de talents en gestion plutôt que de capital monétaire. Le Canada possède un port (Prince Rupert) et la capacité ferroviaire nécessaire pour assumer le leadership continental dans la promotion du mouvement de conteneurs et de marchandises en vrac à destination de la partie centrale de l'Amérique du Nord.

Afin d'exploiter cette capacité physique, il faut créer une plateforme collaborative pour permettre aux utilisateurs et aux fournisseurs de services logistiques d'accéder, ensemble et de façon efficace et économique, à l'infrastructure canadienne pour le mouvement des conteneurs. Si cette plateforme collaborative permet d'obtenir les résultats escomptés, le Canada assistera à une augmentation spectaculaire de la part de l'Amérique du Nord dans le mouvement des conteneurs et des marchandises en vrac. Les réseaux de voies ferrées et les ports comme Prince Rupert devront bientôt augmenter leur capacité à mesure qu'un nombre croissant d'utilisateurs finaux et de sociétés de transport maritime choisiront, pour des raisons de fiabilité, de vitesse et de rentabilité, de faire transiter leurs marchandises par le Canada plutôt que par les États-Unis.

La meilleure façon de se représenter cette plateforme collaborative est de la comparer à une société de services appartenant aux acteurs clés (utilisateurs et fournisseurs) des chaînes d'approvisionnement asiatiques, européennes et nord-américaines. La plateforme met à la disposition des propriétaires et des réseaux adhérents de tous les segments les renseignements critiques dont ils ont besoin pour gérer la chaîne d'approvisionnement de manière efficace et économique. Elle est un outil mis en œuvre par des utilisateurs qui n'ont pas la même facilité à l'employer, mais qui garantit la parité ou un rendement supérieur.

Ce que nous appelons la Porte de l'Amérique du Nord est en train de se concrétiser dans le cadre d'une lente évolution qui amène les utilisateurs finaux et les sociétés de transport maritime à reconnaître les attraits des ports et des réseaux ferroviaires canadiens permettant l'accès au centre de l'Amérique du Nord. Diverses initiatives visant à créer des portes d'accès au Canada, et tout particulièrement les Portes du Pacifique et de l'Atlantique, constituent un effort émergent pour renforcer la collaboration entre les participants à la chaîne d'approvisionnement locale. Notre vision est une augmentation révolutionnaire par paliers des volumes à destination et en provenance du Canada à mesure que la plateforme collaborative permettra l'intégration de nouveaux utilisateurs et acteurs de la chaîne d'approvisionnement et augmentera la fiabilité, la rapidité et la rentabilité du déplacement des marchandises. La PAN de nos ambitions est un projet à la fois national et international qui étend ses tentacules vers l'Asie, l'Europe et le Canada, et partout aux États-Unis.

カナダの未来へのゲートウェイ

中国、インド　をはじめとするアジア諸国から北米への輸入が爆発的に増大したことにより、北米では商港、鉄道、道路上での混雑が問題化しており、この問題への対応が迫られている。

この問題への解決策はカナダ自国内の交通機関インフラ基盤の発展にかかっていると思われる。

なぜなら、カナダは三つの大洋に囲まれ、国内を網羅する鉄道システムを擁し、地理的に、巨大でダイナミックなアメリカ合衆国に至近の距離にある。このようなユニークな立場にあるカナダは、アジアやヨーロッパからの、北米における市場へのゲートウェイとなりうる。過去に鉄道網やセントローレンス河上航路、あるいは“Auto Pact”を開拓したように、このチャレンジに呼応することによってカナダは未来にかけての真の自国発展ビジョンを打ち立てることが出来る。

今日、国際貿易の９０パーセント以上は、コンテナ輸送である。過去４０年の間に　ロスアンジェルス、ロングビーチ、　シアトル、バンクーバー等の西海岸の商港に、コンテナによって運ばれた物量は

１０倍、２百万から２千万TEU　(船荷量の単位) に伸びた。近年の長引く世界的な景気停滞により　需要は減少し、この混雑が一見緩和されたように見えるが、多くの企業専門家は遅くとも２０１５年にはこの混雑問題は危機的な状態に達するという意見である。

アメリカ合衆国での主要商港はいわゆる　“city-locked”.で　拡張進展の余地がない。政府予算の不足や、環境問題、あるいは政治的行き詰まり状態によって、系統だったインフラ基盤への投資は制約されている。

未来へのビジョン

カナダは世界経済に占める輸送発展に多大な貢献が出来る立場にある。カナダ西部の、プリンス　ルパート　や、バンクーバー、東部の　ハリファックスやモントリオールには　生来　競争優位性がある。各自　他のどのアメリカ合衆国の商港よりも、アジア　あるいはヨーロッパにより近く、キャパシティは将来の需要の伸びに対応可能である。その上、夫々の商港は内陸部の市場へと大陸横断鉄道で結ばれている。これらの長所――――地理的位置、キャパシティ、鉄道への接続――――が北米ゲートウェイとしてのカナダの強力な優位性である。

カナダではプリンス　ルパート港（PPR） が、既に　アジアと北米をつなぐゲートウェイとしての活躍を始めている。バンクーバーの北西に位置するPPR

は、アジアからの距離が近く、どの北米の主要港より2000マイル、（すなわち交通時間にして3日間）の短縮となる。また地続きであるため、より多くのコンテナをアジアから北米中央部、特にアメリカ合衆国に送り込んでいる。PPRは北米大陸では2008年の大不況で成長を記録した　唯一のコンテナ商港であった。影響調査結果によると、商港関係の仕事はブリティッシュコロンビア州で＄130million の賃金を創出し、その 州のGDPに$290million 加えることになり、$550millionの経済効果を生み出すことになる。これは　ほんの始まりに過ぎないといえる。

カナダの未来へのゲートウェイ

ビジョンを現実のものとするために

グローバル貿易において北米ゲートウェイとしての役割を果たすためには　カナダは　より大規模な船舶に対応できる能力や　総括的な技術プラットフォームや、主要なサプライチェインプレーヤーの　コミュニケーションリンクが必要となる。中でも次の三点が成功のためには必要である。

政府のコミットメントとサポート。　　カナダ政府は　まず　太平洋と大西洋を結ぶ商港とセントローレンス―五大湖間航路をつなぐゲートウェイの実現に向けて輸送政策を打ち出し　推進役となることが必要不可欠である。これと同時に重要なことは　政府が、金銭的な投資ではなく、インフラ基盤の改善にとりくみ、関連プロジェクトや資金調達を支える新規の政策を発展させ、税金や規制等障害の除去、許可、承認の迅速な処理、さらに　徹底的継続的な国境間保安保持等を、実行していくことである。

最後に、連邦政府と州政府の、各々の貿易、交通、産業部門は、ゲートウェイ実現に向けて互いに全面的に協力しなければならない。

戦略的商港開発

モントリオール、ハリファクス、バンクーバー商港の発展については、大きな混乱なしに　実質的な拡大が可能である。プリンス　ルパート港（ＰＰＲ）については　世界的規模の商港施設を備えるためには、毎年、５百万TEUの増大が必要である。これを実現するには、多くのチャレンジが予想される。たとえば　PPR 設備を拡大するには　莫大な費用がかかるトポロジー的変化が必要なこと、現在の容量をはるかに超える鉄道運輸量の増大の必要性、輸送業者のクリティカルマスを引き寄せること、将来の参加可能性につながる先住民族グループからの協力、将来予想される　U.S.からの保護貿易政策を事前に緩和すること。これら予想される問題点を把握し　対処することが不可欠である。

サプライチェインの調整

効率的な輸送や早いサイクルタイムは燃料コストの増加を相殺するので、インフラ基盤の充実が、商港への需要の増大のエンジンとなる。エンド・ツー・エンドの効率を最適化し、コストを抑える為に　ゲートウェイに必要不可欠なのは、商港当局、ターミナルオペレーター、運送業者、輸出業者、製造業者、小売業者、その他　グローバル　サプライチェインの主要なプレーヤーの密接な協力である。大きな目標のためには、個々人や各社の、私利私欲は　極力抑制されねばならない。しかしながら　、実際的にはこれがかなりの障害になる。サプライチェインを運営する上での目標は、主要なプレーヤーが一丸となって行動することである。このような密接な協力関係を築くことは努力を要する。研究結果によると、エンド・ツー・エンド　サプライチェインが統合すると、運営上の収益は　3倍に上るといわれる。

どのような国家的規模のインフラ基盤プロジェクトについてもいえるが、北米ゲートウェイに不可欠なのは、壮大なビジョン、強力な産業界推進リーダー　更に　国民的サポートである。カナダはこの　枢要な役割を、グローバル経済の中で　十分に果たしうる力量を備えている。また、それは　自国での莫大な経済成長につながる。これを実現するためには政府と　ビジネスリーダーたちがこの問題に優先的に取り組むかどうかにかかっている。

通向加拿大未来的大门

来自中国，印度和其他亚洲经济国家的进口商品的暴增严重导致了北美港口，铁道和道路的拥挤，挑战了我们的对应能力。

解决这日益严重的问题在于加拿大自身的运输系统的基础设施。邻近三大洋，与国家铁路系统相通，并与充满活力的巨大市场美国相邻，加拿大的独特位置使其成为由亚洲和欧洲输往北美市场的北美大门。例如我国的国家铁路，圣劳伦斯海上航道，汽车协议，这真正是一个塑造我国未来的国家建设机会。

当今，超过90%的国际贸易与海上运输有关，大多以集装箱形式。在过去的40年间，运到洛杉矶的西海岸港，长滩（美国加州西南部港市），西雅图和温哥华港口的集装箱量增长了10倍，从2万到20万标准箱（货运能力的大小）。虽然全球经济衰退的持续影响抑制了相应的需求并掩盖了这日益严重的港口拥堵问题，不少业内人士相信，如果不是更早我们将在2015年达到一个危机点。

美国的主要港口是“城市锁定”的。美国对物流基础设施的的支出受制于预算短缺，环境问题的顾虑和政治僵局因素。

未来展望

加拿大在全球经济扩大运输行业中担当重要角色。加拿大西部的鲁珀特王子港和温哥华港及东部的哈利法克斯港和蒙特利尔港具有天然的竞争优势。相比任何一个美国港口，他们更接近亚洲和欧洲，并可根据需求的增大扩大相应的港埠容量和通过横贯大陆的铁路连接内陆市场。优势的地理位置，港埠容量及铁路连接是加拿大作为北美大门的强大优势关键。

加拿大已在鲁珀特王子港（PPR）开始亚洲至北美的运输服务。位于温哥华西北部，PPR比其他任何一个主要港口更近于亚洲2000公里（或3天的运输时间），并运输越来越多来自亚洲和北美中的集装箱，特别是至美国。PPR是2008年经济大萧条期唯一一个扩大发展的陆地集装箱港。影响分析研究显示，贫困工作在不列颠哥伦比亚省的工资创造价值几乎达到$130万，超过全省GDP总值于$290万，并带动5.5亿美元的经济产出。这可能仅仅是开始。

使展望成为现实

要成为面对全球贸易的一个重要北美门户，加拿大需要有能力处理更大船只，并对应供应链参与者的集成技术平台和通信链能力。三个因素是成功的关键：

政府的承诺和支持。加拿大政府必须担当促进大门诱导者和拥护者的角色。通过连接太平洋和大西洋港，圣劳伦斯大湖的走廊的国家运输战略驱动展望前进。相对于金钱，对政府来讲重要的是须关注基础设施的投资，制定新政策以支持相关项目和资金，减少税金并除去监管障碍，加快许可及批准，并同时定期更新处理边境安全。最后，联邦和省的贸易运输部门及工业部门必须共同协调所有关口事宜。

港口发展战略。蒙特利尔, 哈利法克斯和温哥华的港可在不受外部影响下继续扩大其发展。 鲁珀特王子港需提升其港埠容量为每年500万标准箱（5 million TEUs） 以达到世界级的港埠规模和容量。此发展将面临多种挑战:装备设施扩大相关的高成本拓扑环境变化，与铁路运输增加需求不一致的当前港埠容量，吸引一定数量的托运人的需求要求，先住民的参与可能性及减少潜在的美国贸易保护主义。这些问题需预先考虑和说明。

通向加拿大未来的大门

与供应链参与者的联盟。由于高效率的运输过程和快速运转时间可抵消燃料的价格上涨，一部分的港口服务需求取决于高效率的基础设施状况。为了优化终端对终端连接的效率并降低成本，港口大门要求港口当局，终端商，承运商，出口商，制造商，零售商及全球供应链中的关键成员互相进行深层次的合作。更重要的是赢得个人及公司自身利益的共鸣。无可否认，这是一个主要障碍需要克服。目标是使其关键参与者行动像公司一样进行供应链的管理。这种密切合作的努力是值得的。研究表明，当终端对终端连接供应链一体化时，营业利润可增3倍左右。

像所有国家的基础设施项目一样，北美大门户需要一个扣人心弦的展望，强劲的产业拥护支持者和国家支持。如政府及商界领袖能优先考虑此计划，加拿大能在全球经济社会中承担这个重要角色并获得巨大的经济利益。

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THEORY OF THE CASE FOR A NORTH AMERICAN GATEWAY

1

A TREMENDOUS OPPORTUNITY lies before all of Canada to benefit from enormous increases in world trade. Companies are poised to become the key players in the creation of a North American Gateway (NAG) that will speed and increase the reliability of the delivery of containerized goods into and out of North America from Asia and Europe. Canada's infrastructure—ports, railways, terminals, roadways, and airports—is world class, has ample current capacity, and covers the Atlantic and Pacific Oceans and, in future, will cover the Arctic Ocean. Even minor improvements can be remedied with little new financial expenditure, including regular updating of security needs. As this investigation shows from detailed interviews with 80 leading corporate executives, senior officials, academics, port and airport officials, and a few former senior politicians, there is now wide consensus on this unique opportunity to build an NAG for the flow of goods and services from Asia and Europe, employing Canada's infrastructure.

The leading ocean-based Canadian ports other than the Port of Montreal—Vancouver, Prince Rupert, and Halifax—can expand substantially without major disruptions, and they are closer in time, measured in days, to Europe and Asia than their U.S. counterparts. The two national railroads, Canadian National (CN) and Canadian Pacific (CP), have the needed routes and capacities to deliver containerized goods inbound and outbound from Asia and Europe. The terminal operators they work with in Canadian ports and railroads are beginning to develop the deeper collaborative relationships necessary to be worthy of being called "world class" in today's global supply chains.

This is not an opportunity available to U.S. ports and railroads beyond their traditional roles in the domestic market. Throughout the United States, ports will find it difficult to expand their capacity—and this problem also applies to Carrier 1 railroads. Between the forces of environmentalists and NIMBYs ("not in my back yard"), no significant new ports or major rail-capacity expansion are likely in our lifetime. This presents Canada with an exclusive opportunity.

Canada is unique in North America, with two railroads running east-west that have excellent links to port and terminal infrastructure. Canada has 48,068 kilometres of railways, with two Class 1 carriers, CN and CP, owning or leasing some 35,200 km of track. Both CN and CP are active in the United States, with leading U.S. customers, strategic partnerships with U.S. railroads, and easy access to U.S. ports. Indeed, CN, the leading first-tier railway among the six in North America, has a track system that extends from Halifax in the east to Prince Rupert in the west, to Chicago, Memphis, and the Gulf of Mexico in the south. CN serves the ports of Vancouver and Prince Rupert in British Columbia, Montreal and Halifax in the east, and Buffalo, Chicago, Detroit, Duluth, Minneapolis, Green Bay, Memphis, St. Louis, and Jacksonville in the United States. (See Exhibits 1 and 2.)

Canada's national transportation policies, ever more linked to global trade and supply chain management, currently face two issues. The first is transformative: the staggering changes in global transportation-supply chains, with ever-larger ships and aircraft, fewer but more important port developments, shifting traffic corridors through the Suez Canal and the expanded Panama Canal, integration of technological and communications links with inland transportation (freight forwarders, railways, and trucking), and new, strategic, and operational management tools. The second and related issue is the role of corporate supply chains as a vital new element of corporate decision making and strategy.

EXHIBIT 1: CN's North American System

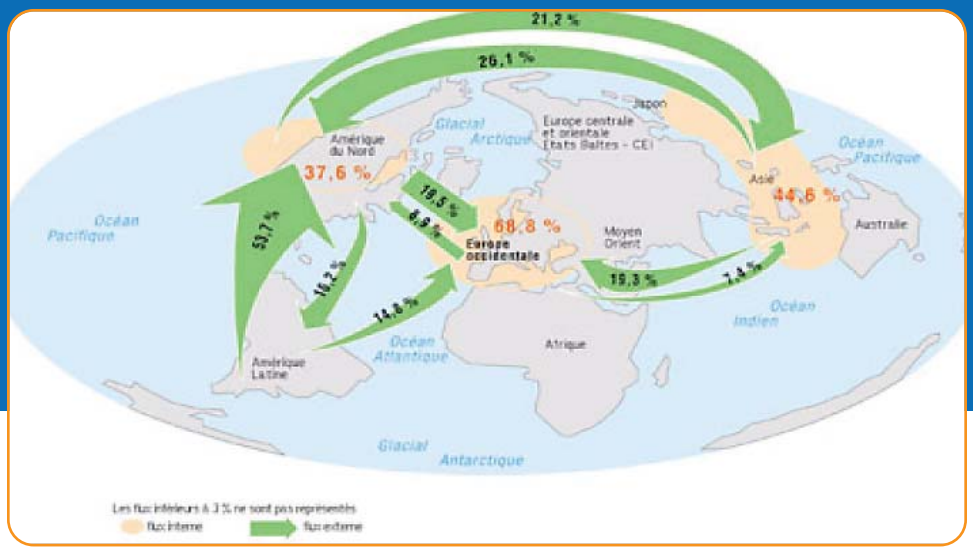
Source: BCG analysis

EXHIBIT 2: CP's North American System

Source: BCG analysis

The explosive growth of world trade over two decades, mainly through ocean-based shipping and containerization, combined with the conversion of all nonbulk freight to the steel "box" —sophisticated, standardized containers (20 feet or 40 feet, measured as 20-foot-equivalent units, or TEUs), requires the conversion of ports to intermodal options. The advent of container shipping makes cargo freight manageable in standard units of intermodal transport (oceans, rail, and trucks). The focus on provincial, regional, or even national supply chains must shift to truly global sourcing of goods, marketing, and transportation policies linking suppliers and customers across international boundaries. (See Exhibits 3 and 4.)

EXHIBIT 3: Major Flows of Containers Throughout the World



Source: BCG analysis

EXHIBIT 4: Global Seaborne Container Growth Rates (million TEUs)

	2010	2011	2012(e)	2013(f)
Global Exports/Imports	140.7	151.4	162.2	174.9
Year-on-Year Growth %	13.0	8.0	7.0	8.0
Imports from NA to Asia %	7.2	7.6	8.1	8.7
Imports from Asia to NA %	13.1	13.1	13.8	14.6

Source: Adapted from Clarkson Research Services (2012); **Note:** *(e) = estimate; (f) = forecast*

By any measure, Asia is the world's growth region, its economies projected to expand from $20.8 trillion to $30.3 trillion in the years between 2011 and 2016—that is, twice the size of the American economy, according to International Monetary Fund projections. Indeed, half the global economy's growth, from a projected $70 trillion to $91 trillion, will be in Asia. After three terrible wars and conflicts—the Pacific War, the Korean War, and Vietnam—Asia has enjoyed two generations of peace, despite military tension in North Korea and U.S.-China rivalries, and steady economic growth has brought rising education and health standards as well as steep declines in poverty—from about 77 percent at the start of the 1980s to less than 15 percent today.

Rising global shipping volumes—averaging 7 percent year-on-year growth since 2011—and the demand for ever-lower costs via megavessels are not the only transportation and infrastructure challenges facing Canada. As more firms engage in global trade, corporations must deal with a new strategic

challenge: organizing innovative global-supply chains. This innovation is complicated, involving inland transit in foreign countries to inland transit in Canada, with various transportation modes in between, from trucking to rail, to sea shipping, to navigating the Suez or Panama canals. In practical terms, global supply chains involve shipping from factories located in distant markets, across global transportation networks, into stores and factories located in consumer shopping clusters in central Canada and markets in the U.S. Midwest. Simplicity, reliability, and time are now the benchmarks of global supply chains.

Like their corporate counterparts in the United States, Canadian firms now need both West Coast and East Coast gateways for overseas cargo through ports and inland transport. The reason is simple: the concept of supply chain economics requires a measure of balance, of inputs and outputs, of suppliers and customers, of a full container in one direction and a full container in the opposite direction. Some retailers (Canadian Tire Corp., for example) have a two-port strategy—shipping certain loads to the West Coast, to serve western Canada and parts of Ontario, and others to the East Coast, to serve markets in Atlantic Canada and parts of Ontario and Quebec.

Air cargo and ocean shipping manifest the way Asian companies and countries use global logistics to link supply chains into global just-in-time (JIT) systems. Historically, primary sectors like the oil industry used these ideas to connect the source of oil production to refiners (often located in different countries, in part because of by-products) and their distribution outlets, such as service stations. The Irving Group of companies illustrates this pattern. A family-owned conglomerate located in New Brunswick, founded by K.C. Irving after he left Imperial Oil in 1924, the Irving Group operates vertically integrated operations in a number of sectors, from oil and gas to pulp and paper, food processing (Cavendish Foods), shipbuilding, and media.

Irving Oil procures energy feedstock from the Caribbean and the Middle East, ships the product to its state-of-the-art Saint John refinery, and then markets the product at Irving service stations located throughout Eastern Canada and New England, usually on Irving ships and its own trucking fleet. Other firms follow similar practices. In Japan, global manufacturers like Toyota locate their factories and assembly plants adjacent to deep-water ports, where the per-car cost of shipping from, say, Nagoya to the Port of London remains cheaper than transport by truck or railway from car factories located within Britain to the Port of London. Today, JIT global logistics have extended to the retail sector, led by firms like Canadian Tire, Hudson's Bay Company, Sobeys, Home Depot, and Ikea.

Air cargo and ocean shipping are booming sectors because more nations are linked by global supply chains, which are based around manufacturing and transport companies. China is the latest and most dramatic example, but nations as diverse as the BRIC countries (Brazil, Russia, India, and China), Vietnam, Indonesia, Egypt, and now countries in Africa illustrate how global manufacturing extends around the world, depending on the sector. Countries now vary tremendously in terms of their transportation, infrastructure, and trade-related services, from online logistics tools, finance, and insurance to supportive regulatory and institutional policy frameworks. Canada is not yet the best, but it is within reach of being a global leader.

The trend is clear: more trade means more JIT flows, involving ever-larger planes and ships, bigger airports and ocean ports, and vastly more people and companies to manage the supply chain, from freight forwarders and trucking companies to IT and security firms. To work very well, global supply chains require intense cooperation among manufacturing firms, logistics, and distribution. As companies become more integrated through global trade, firms require a mix of more integrated services and the cooperation of specialized functions. In transportation, this means intermodal transport services, including ocean shipping and containers; railways and ease of access to ports and factories; and truck services, often employing an integrated IT system to manage manifests, insurance, and other aspects of the global supply-chain system.

This explosion in North American trade with Asia is crashing into increasingly difficult physical barriers. Infrastructure in the United States—ports, railroads, and highways—is nearing capacity. In some sections of the country, the demand is above capacity. The United States is facing a logistics infrastructure crisis whose arrival is only a matter of time. In North America the bones, muscles, and nerves that keep freight in motion are not being maintained, much less invested in, to keep up with the ever-increasing demands placed on them.

The infrastructure crisis is a megatrend, one that will sweep over everything in its path. The growing strain on capacity associated with increasing demand can be found at the

world's container ports, cost-effective railroads that move goods inland, and on the roads where many urban centres struggle daily with gridlock.

Four factors hide the extent of the infrastructure crisis in the United States. First, just as the infrastructure crisis was beginning to blast into boardrooms and family living rooms, the 2008 financial crisis struck, thus depressing demand for goods at home and around the world. This decrease in container load traffic gave infrastructure some much-needed breathing room, but without a substantive increase in investment in U.S. capacity.

Second, the reversal of record-high oil prices has relieved some stress on infrastructure. The shock of the recent spike in prices did, however, highlight the costs of moving goods through complex supply chains. Waiting times and delays, including those at border stops, added to fuel consumption, worsening the problems of supply chain management. Key infrastructure components were already strained by congestion, thus increasing shipment time and amplifying the effects of high oil prices.

Third, supply chain specialists within companies and those advising industry are all over the obvious effects. Many are dispensing copious advice about the cost and investment implications of outsourcing versus insourcing, on-shoring versus off-shoring as a function of rising oil prices, the need to think of sourcing, and manufacturing and distribution as networks where a subtle intervention can make huge differences.

Finally, economic and political forces are beating the drums for infrastructure funding as a source of economic stimulus and job creation. However, despite the seemingly significant accomplishments from this convenient "horse to ride," the economic implications of investing in infrastructure are often overstated. The impact that painting bridges, repairing concrete, and repaving roads make on job creation and the economy is far less than the effective placement of new infrastructure capacity. Furthermore, the amounts earmarked for traditional infrastructure are barely 10 percent of the extraordinary stimulus monies Washington and other governments have pledged in total to revive their economies. The "stimulus hose" is currently aimed at "shovel-ready" projects that are, for the most part, investments in maintenance and removing bottlenecks. The vast majority of these monies are social investments, mostly propping up existing programs.

When the infrastructure crisis does hit, starting in the United States but also in some parts of Canada, the failure of current maintenance-only spending will be clear: nicely painted infrastructure with broken concrete repaired and plenty of bike paths but no sustained commercial impact. When growth returns to the world economy, the real effects of very limited expansion of infrastructure that drives economies will lead to heightened congestion, thus delaying the flow of goods and decreasing the reliability of logistics systems to deliver on time.

A choice must be made: policymakers can be swept along with the tide of increasingly clogged, long, and unreliable logistics infrastructure or they can take decisive action at the expense of competitors. Politicians, among many others, are nowhere near thinking of infrastructure as a competitive opportunity and a weapon of economic policy. Many of the actions executives discuss today are tactical and of the type found in any competent supply-chain report. These actions are usually followed by everyone in the industry, reducing everyone's costs and intensifying instead of relieving pressures on profits.

Without competitively advantaged strategy for dealing with the infrastructure crisis, any fine-tuning of supply chains will be either overwhelmed by the infrastructure megatrend or arbitraged away by equally efficient supply-chain competitors.

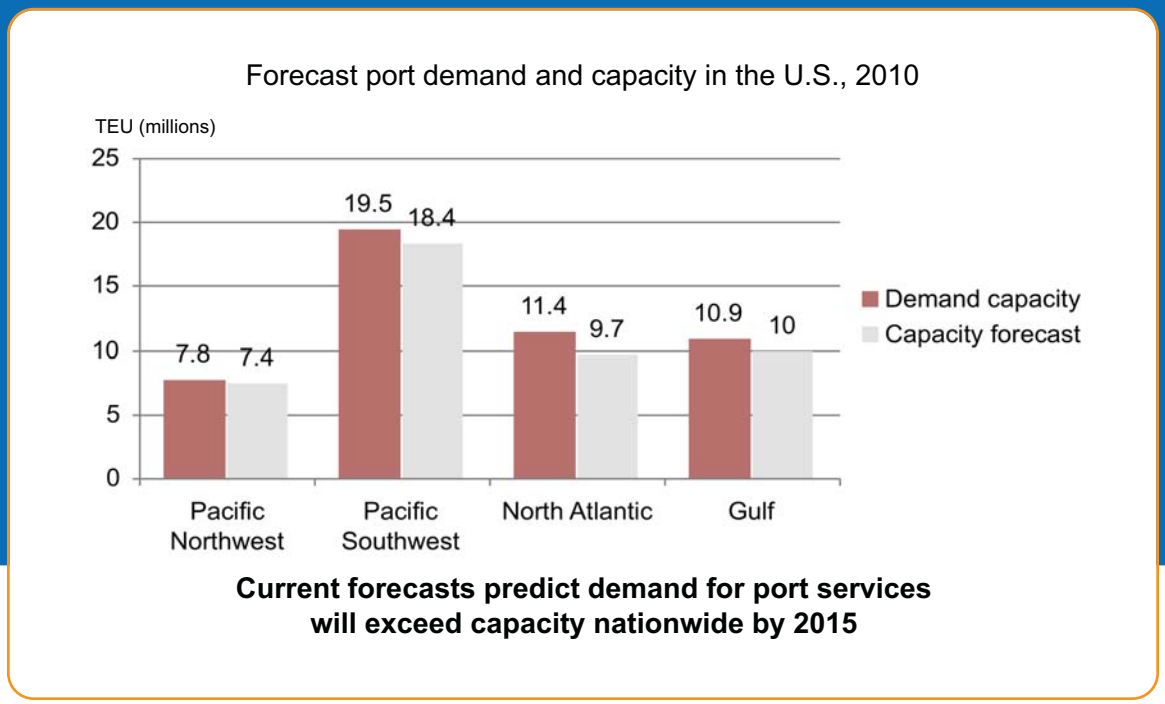
Today's companies built their business models—customers, retail networks, manufacturing, sourcing, and logistics—over the past 50 years. While these "business footprints" were put down, the costs of logistics steadily declined as transportation efficiencies increased and the cost of fuel lessened in real terms. That is why people built big plants and distribution centres in remote locations and trucked goods manufactured in the bowels of Iowa to Chicago and Pittsburgh. This is also the reason China is viable as a sourcing centre for many companies whose markets are in North America and Europe.

So how can Canada move from a tactical, supply-chain focus to a strategic one? Consider first the magnitude of the coming crisis: what is driving it; how it affects companies and customers; and the ways to sneak around the worst effects of the crisis (and leave these for foreign competitors).

Today's talk of infrastructure centres mainly on maintenance. But even if one assumes that everything is in perfect shape—roads do not have potholes, trains do not derail, and bridges do not fall into the Mississippi or Saskatchewan Rivers—North America faces a serious problem. For example, until the summer

of 2010, container ports on both the West and East Coasts of North America were nearing capacity as trade with China and other Asian countries soared. In the past several years, demand to move containers in and out of North America had been growing at 12 percent a year. Several estimates predicted container handling demand outstripping port handling capacity by 2010. Other estimates predicted similar demand-and-supply problems in Western Europe, but not as soon. (See Exhibit 5.) Western Europe has invested more heavily in container ports and, to date, its markets have been less dependent on Chinese-sourced manufactured goods than North America.

EXHIBIT 5: Port Capacity a Significant Issue on the Horizon, Presenting an Opportunity for a NAG



Source: BCG analysis

This problem has been brewing for years. It was evident as early as 2002 to a very few. By 2006 and 2007, industry insiders began to sound alarms. Examine some prescient statements:

> Every aspect of the supply chain is stretched. It's not a question of whether (a congestion crisis) is going to happen. It's a question of when. If the projects planned for Mexico, the United States, and Canada are all available over the next three years, they will barely handle the three years of growth that will occur.
>
> - *Doug Tilden,* CEO Marine Terminals
>
> *Journal of Commerce,* 9 March 2006

These cargo volumes are just beyond belief.... Our ports need to marshal as much of their resources as possible to handle the surges in cargo volume we've been seeing.

> - *Aaron Ellis,* spokesman for the American Association of Port Authorities
>
> *LA Times*, 4 February 2006

Transportation infrastructure isn't keeping pace with the growth in trade. It is a global problem. Inadequate transportation and congestion will negatively impact global growth. Urgent action is required of governments to accelerate the pace of infrastructure development.

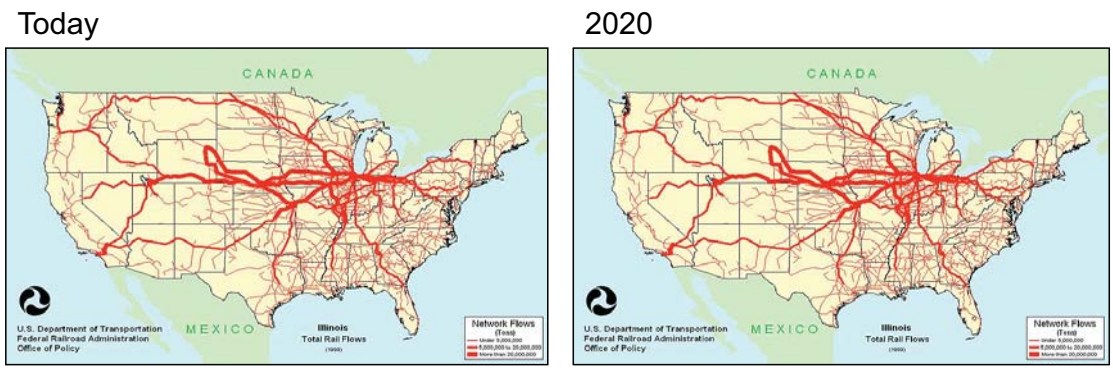
> - *Ron Widdows*
>
> Chief Executive Officer, American President's Line
>
> June 7, 2007

Existing container ports in North America and much of Western Europe are "city locked," almost completely surrounded by water or city. Few residents of cities are fans of container ports. Container ports and associated infrastructure—terminals, truck ways, loading docks, fuel depots—are seen as unsightly, noisy, polluting, and contributing to road congestion. Increasingly, ports, companies, and shipping lines—including very large firms such as Wal-Mart—are starting to develop benchmarks for greener supply chains. In fact, the Environmental Protection Agency is seeking to tighten pollution control on ships entering U.S. ports and on the trucks that service the ports.

There is not much hope for expansion of the West Coast ports' container-handling capacity in North America. Plans to expand port land use for container handling are hopelessly bogged down in political wrangling, from Vancouver to Los Angeles and Long Beach.

In 2006 and 2007, the railways that carry containers inland were also near or under capacity in many key U.S. choke points, including Los Angeles, Chicago, Atlanta, and New York. The expected transit times from the ports of Los Angeles and Long Beach to the Chicago railroad head had increased steadily from 84 hours at the end of 2004 to 134 hours in early 2008. The problem is expected to worsen. (See Exhibit 6.)

EXHIBIT 6: Future U.S. Rail Traffic Flows



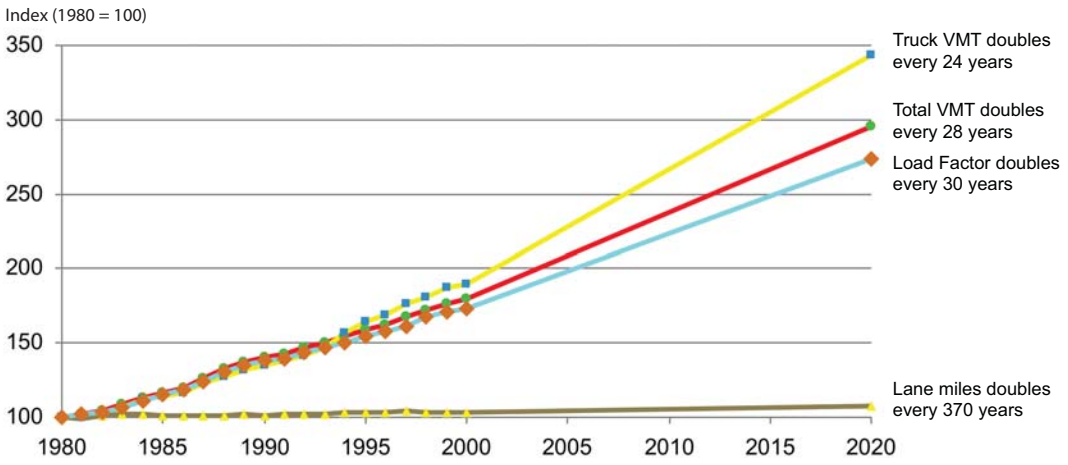
Source: BCG analysis

Executives of leading North American railroads, like those of shipping companies and ports, sounded similar alarms:

> How are we going to handle these huge increases in freight demand, given current transportation infrastructure and the current rate of capital investment by the private railroads and the federal government's tightening transportation budgets?
>
> *- Matthew K. Rose*
> Chairman, President, and CEO
> Burlington Northern Santa Fe Corporation
>
> Before the U.S. House of Representatives Transportation and Infrastructure Committee, April 26, 2006

The U.S. highway systems are also feeling the strain. A measure of the capacity to move vehicles is lane miles. A huge expansion of lane miles occurred in the 1950s, 1960s, and 1970s. But since 1980, growth in the number of U.S. lane miles available to carry traffic has slowed dramatically and is now doubling every 370 years. Meanwhile, the load factor1 on the system is doubling every 30 years. (See Exhibit 7.)

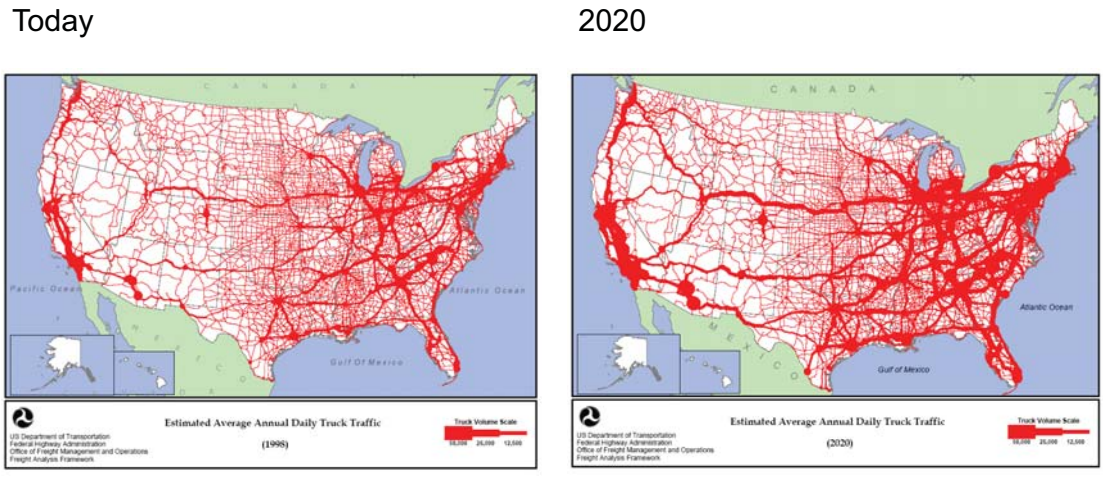
EXHIBIT 7: Load on U.S. Roads Continues to Increase



Source: Federal Highway Administration; Load factor = (total VMT) / (lane-miles), where VMT = vehicle miles traveled

These numbers—370 years and 30 years—do not sound too alarming until one realizes the load factor is increasing at more than ten times the capacity. More frightening is that the increase in load factor is not evenly spread across the country but is concentrated in population centres, including Los Angeles, San Francisco, Seattle, Chicago, Atlanta, and the Northeast. (See Exhibit 8.) One measure of the impact of this concentration is that the sampled yearly-delay times for major metropolitan areas in the United States have risen from 14 hours per year to 36.

EXHIBIT 8: Highway congestion in the U.S.



Source: BCG analysis

Looking over the short term, congestion issues in the United States are not likely to be overcome sufficiently to alter the escalating infrastructure gridlock in the nation's ports, highway system, and truck bypasses in urban areas. Canada and its companies thus have huge advantages, if the will and required increase in coordination are there to exploit them and play a principal role in redesigning the flow of containers into and out of central North America in the twenty-first century. As noted, capacity constraints in Canada are not a serious problem. In general, the three levels of government—federal, provincial, and municipal—work well together, especially in western Canada. And Canada has a forward-looking record of working with public-private partnerships (P3s) to instigate and finance investments in infrastructure that may be needed (for example, the expansion of the Port of Prince Rupert, or PPR).

Although global trade is pivotal to Canada's continued wealth creation, so too is the need for Canadians to become key players in the global supply-chain system to capture a greater share of the wealth generated. For Canadian firms, and for the public sector, that means new requirements: having global operating scale, a critical mass of skills and trained people, and tight transportation links to global companies. Both supply-chain systems—global transport and corporate—illustrate the basic imperative: the overall organization is as strong only as the weakest link. Any barriers—bottlenecks, time lags, quality defects, or sundry imperfections—quickly add to delays and rising costs. The transportation supply chain, by definition, involves both the public and private sectors. International trade means that goods cross borders, so there must be customs and security inspection. And that means a changed view of economic geography, where population centres no longer decide the transport economics: the oceans, suppliers, and end consumers do.

Canada's federal government has done as much as can be expected over two decades by establishing airport and port authorities and allowing them to finance their expansion, by funding border security measures and designing a Canada-U.S. border-perimeter-framework policy, and by initiating funding for Canada's separate gateway strategies to highlight significant costly initiatives. But continued leadership is required. Political champions are needed at all levels of government. However, the task of advancing solutions also falls on the private sector.

What Canada at large—public and private sectors—faces, and what policymakers increasingly understand, is the fact that Canadian industry must fit into global trade and transportation supply chains. Global trade and global logistics are realities. Canada needs to invest in a three-way national strategy that links the Pacific coast ports, the Atlantic coast ports, and the St. Lawrence–Great Lakes corridor. But any initiatives along these lines require a massive educational process in both the public and private sectors, showing Canadians why the country intends to be a global player in international trade and is willing to invest today the time and money to design a transportation system that has the worldwide reach to create jobs tomorrow. The intention of this report is to expedite that education process.

WALK THE LINE

2

A TOUR OF NORTH AMERICA'S SUPPLY CHAIN

For centuries, traders understood the links between land and sea bridges for distant trading centres. These linkages have now been refined by formal models of the close links between transportation trade corridors (ports, ships, containers, shipping firms) and large population centres via airports and runways, warehouses and terminals, large trucking fleets, railways, and highways. (See Exhibit 9.) In the recent past, North America and Europe pioneered this kind of capital-intensive infrastructure, which by its high-usage nature needs constant upgrading and reinvestment as well as a regulatory framework for environmental, weather, and high-population concerns.

EXHIBIT 9: Unspoken Opportunities

Source: BCG analysis

However, for reasons laid out in this report, many countries—including the United States—have stopped spending on building, maintaining, and upgrading infrastructure of all kinds, at great cost to future productivity and prosperity. The current economic downturn has only slowed down the day of reckoning.

The core concept of the NAG is straightforward: *to deliver containerized cargo arriving from Asia and Europe to all of central North America, using Canadian transportation infrastructure, smoothly, reliably, efficiently, and quickly at viable rates through ports on the West and East Coasts.*

From the West Coast, the key elements of the NAG supply chain are as follows:

- The ports and terminal operations in Vancouver and Prince Rupert
- CN and CP rail links to central Canada and the central United States

From the East Coast, the key elements of the NAG supply chain are as follows:

- The ports and terminal operations of Halifax and Montreal
- CP and CN rail links to central Canada and central North America

According to a series of detailed interviews with key players in the supply chain, sufficient capacity exists to support an ample increase in container volumes into North America from Asia and Europe. The job creation potential is substantial. Certain limited investments are needed, though, but mainly from the private sector; public financing from governments would be minimal or not required.

INVESTMENT NEEDED

What are the main investments required to meet expansion in container flows?

- Container handling capacity at PPR, such as cranes at first, then additional docks and terminals
- Rail capacity enhancements, especially in western Canada
- Possibly, improved water depth at the Port of Montreal and the St. Lawrence approaches to Montreal
- Better city-road bypasses in Halifax

Unfortunately, despite how end users (for example, retailers and exporters) and liner companies are attracted to Canadian ports and to railway access into central North America, collaboration remains extremely low. Various Canadian gateway initiatives—most notably the Pacific and Atlantic Gateways—are nascent efforts to bring elements of the local supply chain into stronger collaboration. But most groups invest to optimize their own values, not to optimize the total supply chain by increasing volumes, traffic throughput, and jobs while lowering unit costs.

CASE STUDY

3

PRINCE RUPERT, BRITISH COLUMBIA

A realized vision of a new gateway for the flow of goods and services from Asia to North America already exists at PPR. Located northwest of Vancouver, PPR is the closest port to Asia by some 2,000 miles and can be seen as a pilot project of the NAG. (See Exhibit 10.) PPR, on the West Coast of northern British Columbia, is a pilot of the NAG. The supply chain combination of PPR, Maher Terminals, CN rail, and COSCO (China Overseas Shipping Company) are moving an ever-increasing number of containers from Asia to central North America, particularly the United States. Further, PPR was the only container port on the continent to grow during the Great Recession of 2008.

EXHIBIT 10: Port of Prince Rupert Attracting Attention Because of Its Potential to be a World-Class Container Port

PPR established in 1911
- Initially planned as the preferred route to Asia by CN
- Intended to connect to a fast-speed clipper service sailing to China and Japan
- Used as U.S. military staging arena in WWII
- PPR did not live up to its potential and languished as Vancouver grew

PPR attempted to build bulk port business focused on outbound primary products
- Canadian Board grains (Prince Rupert Grain) - 220M tonne capacity
- Coal (Ridley Terminals Inc.) - 24M tonne capacity
- Lumber and other breakbulk - (Fairview Terminal)

Now attracting substantial attention as container port
- Best natural harbour on West Coast; favorable harbour navigation (two hours pilotage vs. ten hours in other ports)
- Shortest sailing distance between Northeast Asia and North America
- Rail terminus for CN Rail northern line (purchased from BC Rail in 2002) offering fastest route through Canadian Rockies; substantial underutilized capacity; access to superior network to U.S. Midwest

Source: BCG analysis

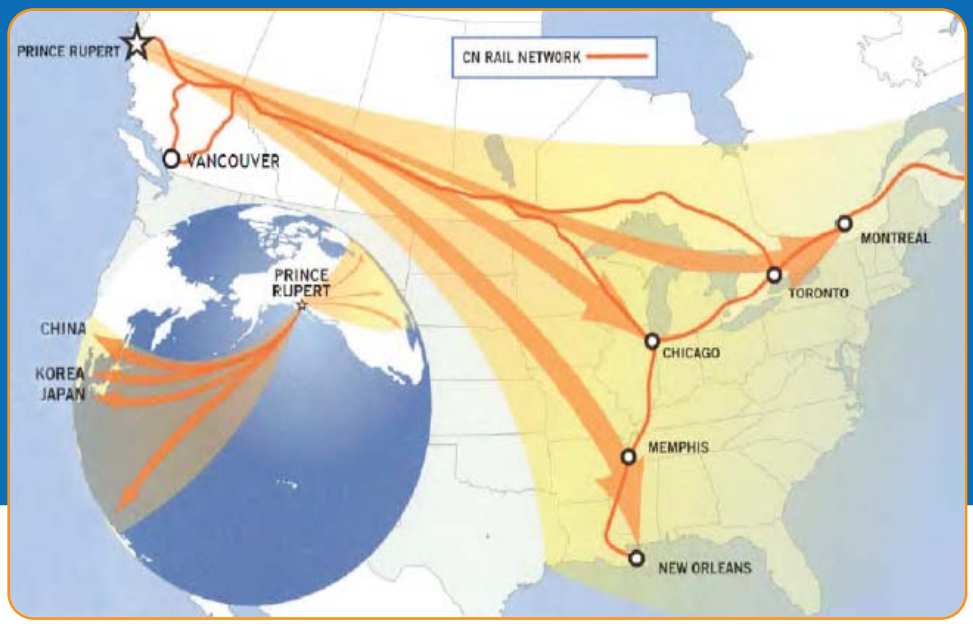
Blessed with one of the deepest natural harbours in the world, plus the deepest inner-harbour entrance, with a channel depth of 35 metres and terminal berths of 17 metres, PPR has the capacity to handle the largest vessels deployed in trans-Pacific trade. It is North America's closest port to key Asian markets by up to three days—indeed, 36 hours closer to Shanghai than Vancouver and more than 68 hours closer than Los Angeles.

PPR (see Exhibit 11) was established during World War II as a staging port for the Allies' push to invade Japan. The invasion never occurred, and the port lay essentially dormant for

decades. Growing Asian trade with Canada and rising exports to Japan and Asia advanced plans for a Pacific Gateway in the 1990s, prompting the federal government to invest in the port and in a railroad to connect it to Canada's eastern provinces.

PPR was conceived as a bulk port for lumber and coal shipments from Canada to Asia, particularly to Japan. Although PPR is still a bulk port, the envisioned volume of bulk movements has so far not materialized.

EXHIBIT 11: Location Advantages of the Port of Prince Rupert



Source: The Port of Prince Rupert

About a decade ago, PPR's management, led by harbour commissioner Don Krusel, decided to transform the port from a purely bulk port into a container port as well. The initial concept was to develop PPR as a feeder to the Port of Vancouver, but ambitions grew as the port developed relations with CN rail and Maher Terminals and sought to become a destination in itself. Maher entered into an agreement with Prince Rupert to help build a terminal capable of handling 500,000 TEUs per year on the docks of what was then the Fairmont Terminal. This building was completed in the spring and summer of 2007, and operations began that fall, when a contract with COSCO was negotiated. PPR's first vessel docked on October 31, 2007, and CN's first container train left the port on November 1.

The early returns suggest that PPR is at least advantaged in time and possibly in cost:

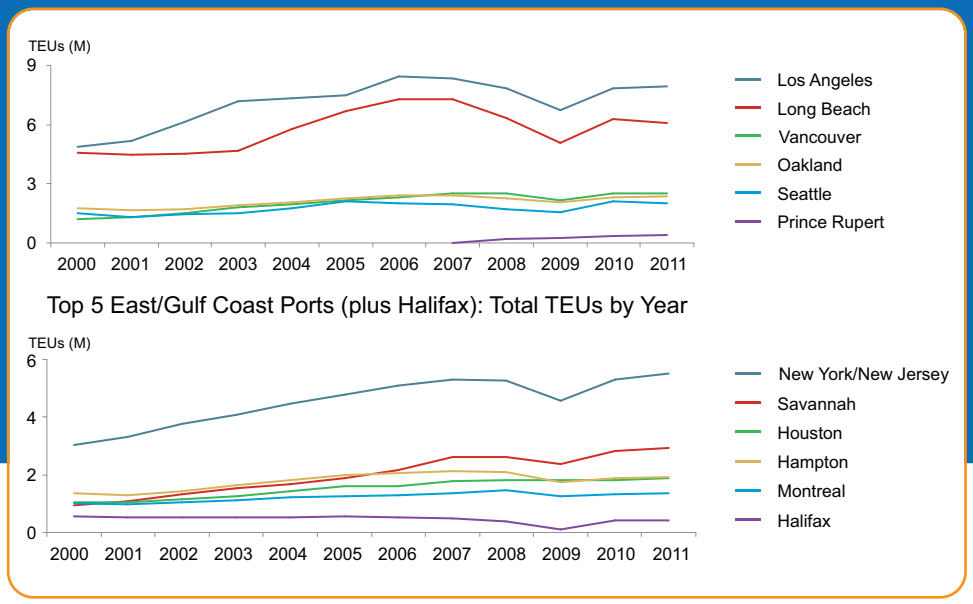
Shanghai to Chicago via	PPR	LA/LB	Vancouver
Ocean transit times (days)	10.6	13.1	15.0
Port dwell time (days)	1.5	2.8	2.5
Rail time (days)	4.0	4.5	6.1
Total transit time (days)	16.1	20.4	23.6

Source: Transport Canada, Interviews, BCG estimates

Today, PPR is nearing its capacity of 500,000 TEUs as a container terminal. The number of jobs has grown by more than 70 percent in the past two years, while the value of export trade through the port has nearly doubled to $4.9 billion since 2009. PPR has generated 2,220 full-time equivalent jobs, an increase of 920 jobs in just two years. Studies show that port-related jobs produce almost $130 million in wages in British Columbia, add more than $290 million to the province's GDP, and spur another $550 million in economic output. Plans are under way in 2012 to increase the capacity of PPR to 2,000,000 TEUs per year in Phase 2, with 61 hectares and new capacity of 1.5 million TEUs. Financing and users are now being solicited.

A capacity of 2 million TEUs per year would place PPR right at the lower limit of what we estimate is needed for the port to be a true destination serving a target market (central North America). (See Exhibit 12) We believe PPR could ultimately handle 5 million TEUs per year. The challenges of achieving this are at least fourfold. First, to increase from 2 million to 5 million TEUs per year could require very expensive topological changes to the area surrounding the existing port or a new way of handling containers off ships to yards that are not by the docks. Second, rail capacity for moving containers inland could be reaching its limits. Third, considerable numbers of shipping users will need to be attracted beyond those served by COSCO. Finally, there may be a level of PPR container movements that might attract American protectionist sentiments from U.S. West Coast ports and their stakeholders. The closest mainland U.S. ports are Tacoma and Seattle. Tacoma's container throughput has declined from 2.07 million TEUs in 2006 to 1.46 million in 2010, while Seattle averaged about 2 million TEUs in the same period. If so, how should the threat of U.S. protectionism be addressed? These issues are discussed later in this report.

EXHIBIT 12: "A crisis is a terrible thing to waste"- Stanford economist Paul Romer



Source: American Association of Pot Authorities North American Container Traffic 1990-2009

DEEP COLLABORATION

4

HOW TO UNLOCK GATEWAY POTENTIAL

The NAG requires a partnership among key players in the global supply chain. The concept of partnership, or more accurately *collaboration*, is seemingly straightforward, a measure of cooperation among different, distinct entities. In practice, it is more complicated—and far more than a mere slogan. Collaboration is a business strategy that involves a deep commitment in time, effort, and joint learning to gain a mutually advantageous competitive advantage across corporate boundaries. Physical capacity of infrastructure is not the limiting issue at play.

For instance, the ports of Prince Rupert and Vancouver on the West Coast and the ports of Halifax and Montreal on the East Coast have natural competitive advantages over the ports in the United States. First, they are physically closer to Asia and Europe, respectively, than are U.S. ports. Second, they are served by railroads that neither have capacity problems nor are constrained from expanding capacity, including terminals and warehouse space.

These issues—location, capacity, and rail connections—suggest that, if left to evolutionary tendencies of continued gridlock in the United States, the Canadian ports should naturally gain a share in the movements of containers to North America over the long term. But there is no guarantee.

An NAG supply chain, however, that ties the West and East Coast ports of Canada together, along with other elements of infrastructure that exploit the benefits of deep collaboration, could radically gain a share for Canada in the movement of containers from Asia and Europe to North America through lower costs, greater reliability, and faster deliveries. Deep collaboration is a strategic tool that allows those who use it huge competitive advantages, provided they invest in the means to make it happen. It is not a communications slogan, a play on words, or a marketing phase that suggests the desire to work together to avoid reaction from government or unhappy firms because of delays and poor service. In fact, for many participants in and users of the existing container-supply chains in North America, *collaboration* is an overused word that, in the end, lacks both substance and the real, sustained mechanisms of collaborative competitive advantage.

However, a few firms do employ the tools of collaboration. The leading Canadian railroads already see the corporate advantages of increased collaboration:

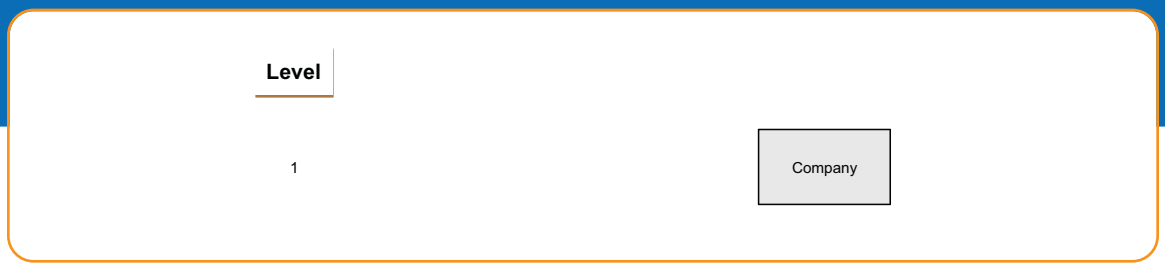
> CP has a reputation for strong relationships with our customers based on trust, service, aligned investments, and supply chain collaboration. It is an approach based on value creation for both CP and our customers.
> - *Jane O'Hagan,* Vice President, CP

> The new CN Supply Chain Collaboration approach that we've been pursuing for the last 18 months is a key reason for this success—and it is anchored on a paradigm of deep collaboration, with the sharing of critical information "as if we were one company" running the supply chain.
> - *Claude Mangeau,* CEO, CN

When people invoke collaboration, they are generally advocating closer and more intimate sharing of information about the performance of their supply chain with their immediate suppliers and customers. This is better than no

collaboration at all but falls far short of the potential for enhanced performance from greater collaboration within and across the supply chain. Consider the supply-chain-collaboration hierarchy shown in Exhibit 13.

EXHIBIT 13: The Collaboration Hierarchy–Conventional Model

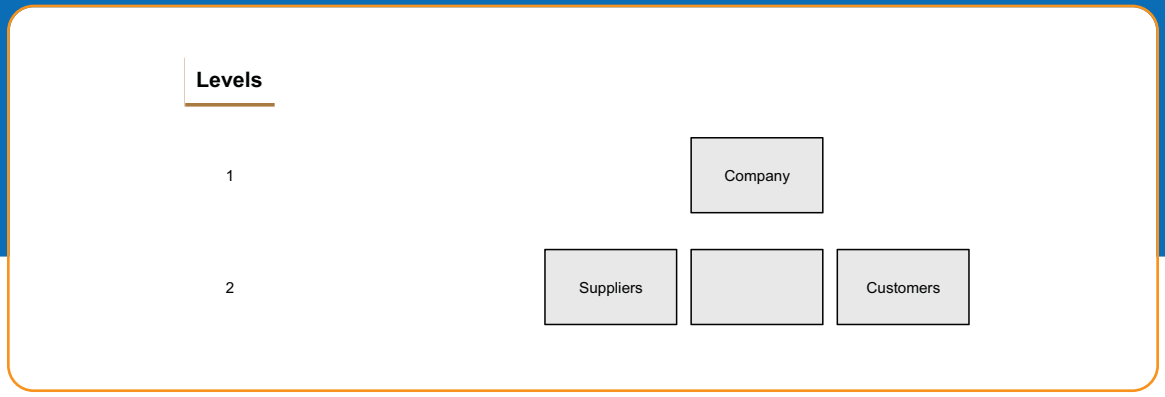


Source: BCG analysis

As depicted in this collaboration hierarchy, there are four levels, going from purely transactional relationships to deep forms of collaboration: sharing information, planning, developing performance metrics, and using joint learning tools. At Level 1, the simplest and most common, there is no collaboration, the relationships between a company and its suppliers and customers are purely transactional, and the company keeps its suppliers and customers held at "arm's length."

Level 2 is where most companies who readily espouse being collaborative are today. At this level, companies attempt to share information about their performance at or near the interface immediately between them. (See Exhibit 14.) For example, the demand-and-planning forecasts of a manufacturer become the operations plan of the supplier. Collaboration is sequential and linear.

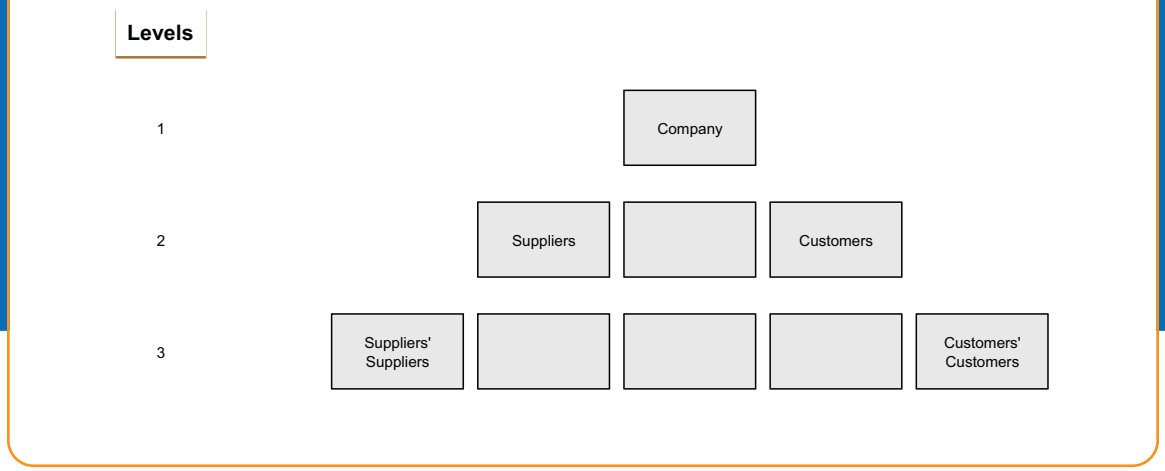
EXHIBIT 14: The Collaboration Hierarchy–Conventional Model



Source: BCG analysis

At Level 3, collaboration starts to have real meaning. Companies share performance data not just with their suppliers and customers but with their suppliers' suppliers and their customers' customers. (See Exhibit 15.) At this point, the power of collaboration on supply chain performance starts to be significant.

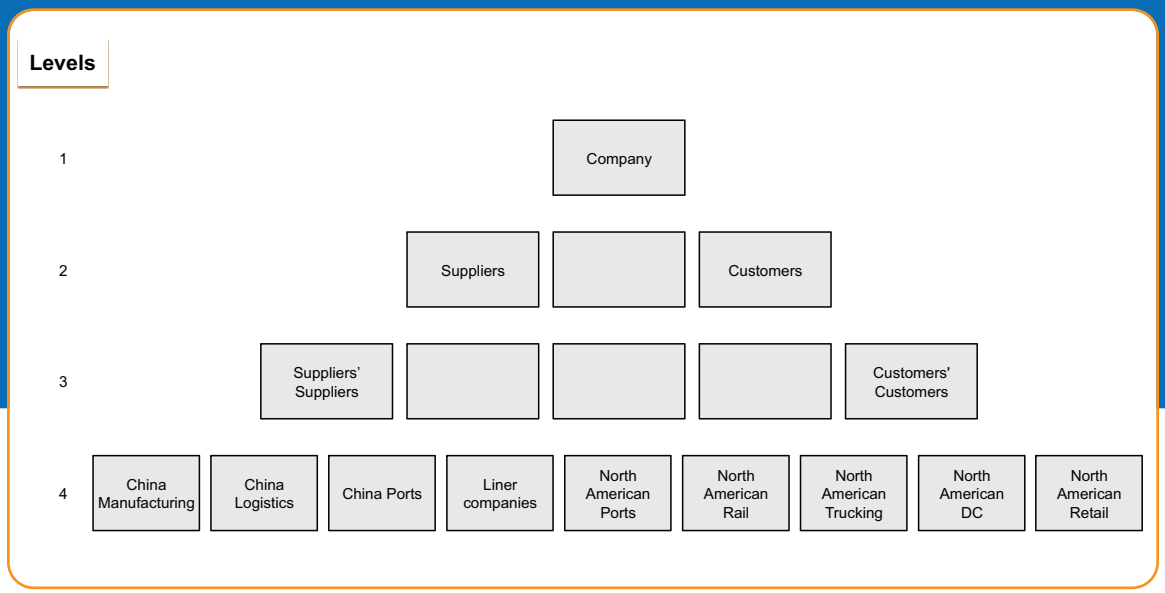
EXHIBIT 15: The Collaboration Hierarchy-Conventional Model



Source: BCG analysis

Finally, at Level 4, virtually the entire supply chain is engaged in collaboration. (See Exhibit 16.) Here, the full effects of collaboration are most pronounced. In theory, this collaboration extends well beyond the domestic market to overseas plants, logistics service providers, and transportation infrastructure firms— ports, terminal operators, railroads, and truckers. Only a handful of companies have achieved anything close to Level 4. Wal-Mart, Canadian Tire, and Li and Fung stand out.

EXHIBIT 16: The Collaboration Hierarchy-Conventional Model



Source: BCG analysis

Deep collaboration requires corporate commitment, time, and new network-technology tools that provide continuous information, plus updating and tracking of container flows from the first mile to the last mile of the supply-chain-logistics journey. The power of achieving Level 4 collaboration can be seen in the results of a supply chain simulation shown in Exhibit 17.

EXHIBIT 17: Supply Chain Simulation: Sequence of Competitive Moves and Impacts

		Domestic Mfg. Only	Entry of Chinese Competitor		Chinese Competitor Integrates		Price Reduction		Nrth. American Mnf. Optimizes Supply Chain		Bottlenecks in the Asian Supply Chain		Bottlenecks + Uncertain Transit Time	
Supply Source		North America	North America	China	North America	China	North America	China	North America	China	North America	China	North America	China
Integration		Non-integrated	Non-integrated	Non-integrated	Non-integrated	Semi-integrated	Non-integrated	Semi-integrated	Integrated	Semi-integrated	Integrated	Semi-integrated	Integrated	Semi-integrated
Cycle Time	weeks	6	6	11	6	11	6	11	3	11	3	18	3	18+/-6
Retail Price	$/unit	$10	$10	$10	$10	$10	$9	$9	$9	$9	$9	$9	$9	$9
Manuf. Cost	$/unit	$4	$4	$3	$4	$3	$4	$3	$4	$3	$4	$3	$4	$3
Theoretical Operating Profit	$/unit	$4	$4	$5	$4	$5	$3	$4	$3	$4	$3	$4	$3	$4
Actual Operating Profit	$/unit	$0.77	$0.77	$1.02	$0.77	$1.21	($0.16)	$0.28	($2.19)	$0.28	($2.19)	$0.70	($2.19)	$1.43
Advantage/ (-)Disadvantage	$/unit			32%		57%		n.a		-87%		-132%		-165%

Source: BCG analysis

In the exhibit, the effects of increasing levels of collaboration can been seen in actual operating profit per unit as one looks across the columns. A nonintegrated supply chain is equivalent to Level 1 collaboration, where each step reacts to the needs of the next step down and the next one up. When the China-anchored supply chain goes from nonintegrated to semi-integrated, it enjoys an approximate jump in operating profit per unit of about 20 percent. A semi-integrated supply chain is equivalent to partial collaboration, or Levels 2 and 3 collaboration. (For a full explanation of the simulation, please see "Surviving the China Rip Tide: How to Profit from the Supply Chain Bottleneck," BCG Report, May 2007.)

To get a sense of the full impact of Level 4 collaboration, compare the operating profits per unit of the North American-anchored supply chain that is not integrated with that of the North American-anchored chain that is integrated. The operating profit per unit is about three times greater for the integrated supply chain.

Level 4 collaboration is the targeted goal of the NAG. The profit impact to the participants in the supply chain will be enormous. Today, most participants are at Level 1. A couple of participants are at Level 2, and only one is at Level 3.

Making Level 4 collaboration possible in the NAG will be challenging. The creation of a collaborative technology

platform would entail the following elements, at a minimum:

- A Canadian port, a terminal operator, and a series of shippers, exporters, and retailers
- A powerful IT platform containing access to participants, with information sharing agreed to by the participants
- An online data analysis of tracking, placement, and connectivity within the global supply chain
- No access to competitor data through participation in the platform network

The architecture would be similar to that of Coviscint, a novel collaborative platform in the auto sector. Coviscint was an attempt by several automotive original-equipment manufacturers (OEMs) to create a platform that would enable more effective, multitiered collaboration among suppliers. It is like Excel in that the tool is the same for all users but the effects of using the tool are the result of each company's skill with it. Coviscint eventually failed because of the near-term greed of the auto OEMs to profit by using it as an auction platform to beat up suppliers ever further on price. But the concept was sound—so much so that Coviscint was investigated by the U.S. Federal Trade Commission and eventually cleared to proceed.

Interviews with corporate executives across Canada showed great interest in this collaborative-technology-platform model to improve service and reduce unpredictability and wait times. However, any business model for a collaborative platform would have to meet certain conditions: no firm would get access to competitor data and planning tools, and no firm would have a free rider advantage—that is, easy access to supply chain data other than their own, corporate data, and customer planning flows to build their own corporate advantages. The government officials, port authorities, and terminal operators interviewed also saw the advantages of a collaborative platform but felt that private-sector companies should take the lead in developing it.

THE SIZE OF THE NORTH AMERICAN GATEWAY PRIZE

5

THE NAG STRATEGY HAS SEVERAL DIMENSIONS, including making the best use of existing capacity, dramatically improving the flow of goods in order to lower consumer prices, building wealth and market share for investors, and creating high-paid, meaningful jobs in Canada. Better container-flow market share improves the business model of the players in the global supply chain as well. But there are also secondary advantages. Canadian firms will become open to a new, global mindset—a worldwide outlook, a shifting of the centre of gravity to Asia, and the importance of both physical and IT infrastructure.

EXHIBIT 18: Port Traffic, 2010: Comparisons (in TEUs)

Country	West Coast	East Coast	Total
Canada	2,857,675	1,938,441	4,896,126
U.S.	22,203,507	19,203,947	41,407,454
Subtotals	25,061,182	21,142,388	46,203,580

Source: Calculated from Container Trade Statistics

But the question remains: why should Canada be a preferred NAG for commerce from Europe and Asia? Consider the following advantages:

- Canada has some extremely sophisticated companies and executives in logistics and supply chain management, as well as top federal and provincial officials and politicians who understand the competitive challenges the nation faces from Asia.
- Existing Canadian transportation infrastructure has the capacity and capability to meet the needs of participants

for reliability, speed, low cost, and security better than the increasingly congested and underfunded U.S. gateways and corridors. It would require some investment in the following:

- Infrastructure (roads, rail spurs) to remove possible bottlenecks at PPR and Vancouver
- Regularly updated border security that is world class
- Mechanical automation at ports to increase throughput efficiency and reduce dwell times
- Technology and IT systems to achieve greater connectivity among participants
- Continuous and robust marketing to increase awareness among U.S. shippers and to overcome any negative perceptions of border delays, labour problems, or other related issues.

- Unlike in the United States, the capacity of Canadian ports and railroads can be expanded significantly.
- Serious interest in the idea already exists, with numerous gateway and corridor initiatives under way or being considered, including the Pacific, Atlantic, Northern, CentrePort, and Central Corridor Gateways.

Developing the NAG is a nation-building opportunity that would bring about both political and commercial benefits for Canada, participants, and other national stakeholders, with the substantial upsides of increased trade, higher volumes, and higher-paying jobs. More specifically, some of the benefits are as follows:

- The significant job-creation potential has public and political appeal.
- Job creation will be propelled both by the growth of current participants and that of new spinoff businesses.
- The flow of containers into and out of the East and West Coast ports will balance.
- The use of technology to raise collaboration among supply chain participants presents the opportunity to set up a shared commercial platform for collaboration—built by a few for the benefit of many.

As in many new projects, not surprisingly, politics can trump economics. Canada needs a continent-wide vision of what the NAG will look like, as well as strong policy and business cases to support it. Some of the new elements that would be needed are these:

- Policy changes to enable new initiatives that provide labour measures (for example, training and other policy support) and remove regulatory impediments to achieving the vision
- A clear business case for the benefits that will accrue to Canada, the U.S. participants, and other stakeholders
- Stakeholder understanding of the investments required, their sequencing, and their timing
- A business case specifically for the collaborative platform, building on the rationale for Canada being the NAG
- A champion or small group of private-sector champions to channel business case development and make the political and marketing sales argument

No one firm on its own can do all of these. Deep collaboration among participants is vital. And although the task does not require government funding, it does require governments at all levels to understand and promote the NAG strategy and framework.

Consider the impact of potential increases in container volumes, shown in Exhibit 19. In 2010, total U.S. container port traffic amounted to 42,283,401 TEUs, whereas it was 4,796,116 TEUs for Canada and 3,705,760 TEUs for Mexico. Canada's West Coast port traffic amounted to 2,857,675 TEUs, and the East Coast port traffic was 1,938,441 TEUs, as opposed to 22,203,507 TEUs for U.S. West Coast ports and 19,203, 947 TEUs for U.S. East Coast ports.

EXHIBIT 19: Potential Volume Gain in TEUs from Canada as the NAG, Using Prerecession (2007) Volume Base

	West Coast	East Coast	Total	Canadian volume gain from U.S. West Coast (cum.)			
				5%	10%	15%	20%
Canada	2,512,225	1,853,093	4,365,318	5,463,024	6,560,730	7,658,437	8,756,143
% Change vs 2007 total				25%	50%	75%	101%
U.S.	21,954,125	17,212,373	39,166,498	38,068,791	36,971,085	35,873,379	34,775,673
% Change vs 2007 total				-3%	-6%	-8%	-11%
Total N.A.	24,466,350	19,065,466	43,531,816	43,531,816	43,531,816	43,531,816	43,531,816

Source: Consultant's analysis using 2007 data from the American Association of Port Authorities' website

North American inbound and outbound containers for both coasts totaled about 46.3 million TEUs in 2010, with Canadian containers accounting for more than 10 percent of this amount. If the North America Gateway is competitive enough and the flow of containers to North America is diverted from the U.S. West Coast through Canada, boosting traffic to domestic ports by 5 percent, Canada would experience an increase of about a million containers per year at constant total-North-American-container volumes. The United States would experience a 3 percent decline in total volume.

We believe the NAG could readily take 10 percent of the volume from U.S. ports, even during the current recession. This would result in a 50 percent increase in container volumes through Canadian ports. The U.S. ports would then lose 6 percent of their volume. This is probably the number at which the United States would take protectionist action.

But the data in Exhibit 20 show the large potential impact of the NAG on container flow though Canada. The data also show the urgency of expanding PPP. The impact on employment is equally striking, assuming simple gains in container flows at both the West and East Coasts. The costs of moving a container, and the resulting employment gains, fall into five major categories:

- The ship (23 percent), including operating expenses, capital costs, and bunker fuel, diminishing with economies of scale (larger container ships)
- Containers (18 percent), including finance leasing and maintenance costs
- Ports and terminals (21 percent), including stevedoring
- Inland transport (25 percent), including trucking and rail
- Other costs, including container repositioning (13 percent)

Overall, inland transportation, including port costs, account for about 54 percent of all container costs.

EXHIBIT 20: Potential Job Creation Impact of NAG Capture from U.S. Volumes (TEUs)

(5% = 1,097,706 TEUs West Coast; 860,619 TEUs East Coast[1])

	Current TEUs	Direct Jobs	Total Wages	TEU-Jobs Ratio	TEU Wage Ratio	Jobs Impact[2]	Wages Impact
East Coast: Halifax Montreal	490,000 1,300,000	4,685 1,850	49.6 m 32.1 m	104.589 702,702	1012.24 2469.23	4496 1742	43.5m 10.6m
West Coast: Vancouver Prince Rupert	2,500,000 180,000	47,700 1,300	265.2 m 80.0 m	52,410 138,461	1060.80 4444.44	5822 3963	58.2m 243.9m

Source: Chris Lowe Group – Port of Halifax; Invista; Port of Montreal annual reports; Prince Rupert Impact Study; Vancouver Economic Impact Study: Invistas.

[1] Estimate is from Potential TEU Volume Captured by Canada's North American Gateway.

[2] Assumes, for jobs and wages impact, 50-50 split for each port on the East Coast and the West Coast.

Canadian port traffic has already regained, and now exceeds, the volumes that dropped after the 2008 financial crisis. (In 2007 and 2008 Vancouver averaged about 2,493,000 TEUs, which declined to 2,152,000 TEUs in 2009; Montreal went down from 1,473,000 TEUs in 2008 to 1,247,890 TEUs in 2009, and in 2010 it climbed to 1,331,000 TEUs, the highest in ten years.) Studies of the job impacts of increased container volumes, applied to the four leading Canadian ports, show huge gains in the number of jobs and the level of wages at the ports alone, without even accounting for new jobs in other logistics areas, including trucking, terminals, and rail.

LINKING THE NORTH AMERICAN GATEWAY TO OTHER CANADIAN GATEWAY EFFORTS

6

CANADA IS SINGULARLY POSITIONED TO BE the NAG for the flow of commerce from Asia and Europe to all of North America. A closer look shows Canada's unique advantages. The flow of commerce within North America is becoming more and more congested, reducing corporate productivity through delays and traffic jams and lowering overall productiveness while driving up all costs. Yet, as shown by numerous studies over many years, including the American Society of Civil Engineer's "Report Card," U.S. federal and state investments in port, rail, road, and airport capacity are increasingly constrained by a shortage of money, social concerns about noise, wasted fuel, environmental challenges, traffic congestion, and the politics of partisan gridlock among stakeholders.

What Canada faces, and what policymakers must understand, is the question of how Canadian industry fits into global-transportation supply chains. Global trade and global logistics are realities. Canada needs to invest in a three-way national strategy to link the Pacific coast ports, the Atlantic coast ports, and the St. Lawrence-Great Lakes corridor. But any such initiative requires a massive educational process to show Canadians why the country intends to be a global player in international trade and is willing to put in the time and money to design a transportation system that has global reach and impact.

Unfortunately for Canada, the world is not standing still. From Dubai to Vietnam, from new ports in China to well-established ports like Rotterdam and Hong Kong, there are new gateway linkages to East and West Coast ports in the United States. Three strategic stakeholders—shipping companies, terminal operators, and port facilities for air cargo and sea)—are accelerating corporate transformations as part of changing global and regional trade strategies.

Two global trends are unmistakable. First, the global economy has already shifted dramatically from the Atlantic-centred market of Europe-North America to the Pacific Rim and Asian markets like Japan, China, and India, as well as from the traditional, developed, triad economies (Europe, North America, and Japan) to the developing world. This new mix, even when China is excluded, now accounts for one-third of world trade (28.8 percent of merchandise exports, 26.3 percent of imports). China adds about 5.5 percent, but its trade is growing at 20 to 25 percent a year, linked to supply chains in Asia and North America.

The second trend is equally profound for the global economy. East Asian economies are following a path similar to the one Japan followed in the 1970s and 1980s, now being emulated by China: they are accelerating their industrial growth by moving up the value chain to more sophisticated products, components, and technologies. All over Asia, factories operate with state-of-the-art equipment and the latest industrial processes imported from Japan, the United States, or Europe, with managers and engineers trained in reputable foreign universities. What was true two decades ago about Japan, which trained engineers while the United States trained lawyers, applies to Asia: India and China each produce more engineers than Europe and the United States combined. India and China are shifting their industrial production away from labour- and commodity-intensive product lines to sophisticated technology -intensive output, as Japan did a generation ago. High-value products and services become trade intensive—and a part of global supply chains.

Consider a range of recent developments in other countries:

- Plans have been drawn to enlarge the Panama Canal over the next 20 years so it can receive post-Panamax ships of up to 15,000 TEUs.
- New rail services (two trains per day) link Long Beach,

California to Atlanta, Georgia to ease congestion on the West Coast of North America.

- New ocean ports established in India allow manufactured goods like steel, textiles, and autos to be shipped not only to Asian markets but eventually to North America through the Suez Canal.
- New combinations of ocean shipping and air cargo transport have shortened roundtrip trans-Pacific cargo-shipping time from Asian ports to between 32 and 35 days and to 65 days through the Panama Canal.
- In a post-9/11 world, new (and often untested) security initiatives, including the U.S. Secure Freight Initiative, use imaging technology to screen for nuclear products and weaponry in foreign as well as domestic ports and terminals.
- Global alliances and business cooperation agreements exist between shipping companies, terminal operators, and railway companies to manage the dramatic new demands of just-in-time delivery around price, quality, and delivery, where true costs are quickly exposed because of traffic gridlock.
- New thinking has evolved regarding supply chain bottlenecks caused by unforeseen events, such as disasters like the earthquake and tsunami in Japan in 2010, which cut off components critical for computers, autos, and aerospace products.

Canadians have been increasing their global trade exposure for generations, but mainly from a mindset that focuses on North America. Except for a few industries, Europe is seen as a niche market. Outside the airline sector, transport has largely been seen through the prism of North America, and especially the states lying contiguous to Ontario and Quebec. Since the Canada-U.S. Free Trade Agreement was signed (later expanded to become the North American Free Trade Agreement, or NAFTA), Canadians have reoriented their trade links away from a national focus (east-west) to a North American one (north-south). This has culminated in new transport arrangements, such as the Open Skies air pact with the United States and a powerful railway system developed by CN, not only across Canada (like that of its rival CP) but north-south to the Gulf of Mexico, with a large terminus in Memphis and strong market share in other big-container markets like Detroit and Chicago.

Canada's Gateway Strategies

For more than 30 years, Canadian policymakers have been concerned with the country's gateway strategies—transportation links via air, oceans, the Great Lakes, and rail—that shape Canada's export and import flows. Initially, Japan was one of the first priorities, as that country's dramatic growth led to an apparently insatiable demand for Canadian raw materials—timber, coal, grain, pulp, and paper—and an equally dramatic rise of Japanese exports like automobiles and consumer electronics. Container flows were two-way. Pacific Rim trade with North America grew, and West Coast ports—Los Angeles and Long Beach, Seattle and Vancouver—faced increasing congestion as the flow of containers across the Pacific skyrocketed from 2 million TEUs in 1970 to an estimated 28.1 million TEUs in 2012.

Today, Canada has focused on five separate regional-gateway strategies— listed here, from east to west—that connect transportation needs to local partnerships and stakeholders:

- Atlantic Gateway
- Central Corridor
- CentrePort
- Arctic Gateway
- Pacific Gateway

Exhibit 21 summarizes the key features of the Canada's gateway strategies and the evolving policy issues.

EXHIBIT 21: Profile of Canada's Gateways

Gateway location	Central locale	Overseas linkages	Main investments	Strategic advantage	Expected dollar investments
Atlantic Gateway	Halifax, Montreal, St. John, Melford	Rotterdam, Hamburg, Suez Canal	Port terminals, border security	Time to Europe & Chicago	$200 million to $300 million
Central Corridor	Central Canada & central U.S.	Minimal	Roads/ highways—Detroit-Windsor Bridge	Size of the market—delivery by trucks	$200 million to $500 million
CentrePort, Manitoba	Winnipeg, multimodal hub	Russia & central China	Highways, rail	Centrality: Access to all gateways in Canada	$200 million to $300 million
Arctic Gateway	Port of Churchill, Manitoba	Asia, Europe	Ports, icebreakers, rail	Shortest route Asia & Europe	$100 million
Pacific Gateway	Vancouver, Prince Rupert	China, Japan, Korea	Perimeter roads, Port Mann Bridge, road infrastructure, traffic management centre	Shortest container route between North America & Asia	$5 billion to $7 billion, public and private 2012–2020

Source: BCG analysis

The Atlantic Gateway: Canada's Atlantic Gateway dates from the time of the first European settlers over 400 years ago and now consists of the two main ports, Montreal and Halifax, and regional ports like Quebec, St. John's, Sidney, and the fledgling Port of Melford in Canso, Nova Scotia. As a result of limited cooperation and rivalry among provinces, and the lack of a gateway champion driving the necessary policy focus, the Atlantic Gateway strategy for the East Coast around the ports of Halifax and Montreal is less developed than for the other ports.

The prospect of very large container ships coming into service makes Halifax the natural entry point for goods shipped from Europe or through the Panama Canal. In the United States, new investment developments and new infrastructure—for instance, terminals, warehouses, and railway lines—indicate that Washington is not a bystander to the changing global-trade game. Consider recent projects at U.S. East Coast ports:

- In New York/New Jersey, port authority invested $760 million to deepen the port channel to 50 feet, and $1.6 billion port infrastructure.
- The Norfolk Port in Virginia is investing $400 million in container terminals and new on-dock rail capacity.
- At the Port of Charleston, a new three-berth container terminal at a former naval base will elevate capacity by 1.4 million TEUs to more than 4 million TEUs per year, double that of Vancouver. Crane operations have increased substantially, from 40 container moves per hour to 53 per hour, thus reducing dwell time.
- New warehouse facilities in Houston constructed by Wal-Mart (1.3 million square feet) compliment a 1.4 million square-foot warehouse by Home Depot and a 1.5 million square-foot facility in Virginia by Target Stores.
- In Miami, a plan has been drawn up by Dade County for $250 million of investments in port infrastructure, including port deepening by the U.S. Army Corps of Engineers.

Part of the East Coast development in the United States is prompted by the staggering port developments in China and, after some considerable delay, India. In China, concrete plans exist for 100 new container-loading berths, each with an annual capacity of 500,000 TEUs—the equivalent of Halifax's capacity. In India, a new 20-year plan aims to develop ports and port infrastructure so as to increase India's port capacity from 750 million tons to 1.5 billion by 2012 and 2 billion in 2016. Private-sector development in Indian ports now exceeds $2 billion dollars and is growing fast. In addition to Canada's competition from the United States are new developments in Mexico and ports in the Dominican Republic and other Caribbean islands adjacent to the Panama Canal.

The question: are local and regional ports in the Atlantic region prepared to build a globally successful gateway extending to a national transportation corridor? For instance, how does Labrador deliver its iron ore to the steel mills of Hamilton and Pittsburgh? The answer: by train and bulk cargo on the St. Lawrence River. Today, the markets of Asia are open to Newfoundland via inshore shipping and container vessels.

Although this may sound like a contradiction in terms, Canada needs an Atlantic Gateway strategy to cope with Pacific Rim trade. Some corporations understand this paradox. Canadian Tire, for example, operates a two-port logistics strategy—Vancouver and Halifax. Two-way trade between North America and Asia, and between Canada and Asia, has increased dramatically. But global trade raises the need for complicated supply chains and results in logistical problems for Canadian companies, which are centred in Ontario and Quebec. Furthermore, some of these imported goods are destined for the U.S. interior, especially to Chicago-area manufacturing and retailing hubs extending throughout the central North American population corridor.

In the past, the cheapest routes from China, South Korea, and Japan into East Coast ports were through the Panama Canal. Demand is growing, however, for state-of-the-art shipping into the Atlantic coast ports of North America, like Montreal, Halifax, and Saint John. Potentially, the Atlantic Gateway combines a new policy mix, involving the needs of importers (countries, companies, and transport firms), the private sector (manufacturers, retailers, and niche players), the transportation industry, the provincial governments of Atlantic Canada, and the federal government.

The Ontario-Quebec Continental Gateway: The Continental Gateway—a multimodal transportation system of ports, airports, terminals, and border crossings linking highways, rail, and marine infrastructure—facilitates foreign trade mainly with contiguous states in the United States. Ideally, the Continental Gateway ensures connection to, and seamless integration with, such Canadian ocean routes as the Pacific and Atlantic Gateways.

In 2006, Ontario and Quebec crafted a cooperation protocol to develop and enhance the Ontario-Quebec Trade Corridor as part of the federal government's strategy to launch the National Policy Framework for Strategic Gateways and Trade Corridors. This strategy provides a comprehensive framework for infrastructure, policy initiatives like border security, and regulatory recommendations for the short, medium, and longer term in order to support international trade through the Continental Gateway. The most important initiative is the construction of a new bridge linking Windsor and Detroit, where the federal government has taken the initiative and provided funding in concert with the State of Michigan.

CentrePort: CentrePort Canada is North America's newest 20,000-acre inland port and foreign trade zone (FTZ), offering unique access to trimodal transportation (road, rail, and air). CentrePort is the country's only FTZ and trimodal inland port. Located next to Winnipeg's international airport, CentrePort Canada sells or leases high-quality industrial land and has 2,000 acres for development and 550,000 square feet of space in existing warehouse facilities. CentrePort is conveniently located in the central time zone and has well-established connections for access to major road, rail, and sea corridors and gateways, including eastern and western Canada, the United States, Mexico, and Latin America, as well as Europe and Asia. It is a one-hour drive north of the Emerson border crossing into the United States. In 2009 it processed about $14 billion in trade.

Two major initiatives show CentrePort's intention to have a global reach. The first is a common-use rail facility, involving three Class 1 rail carriers (CP, CN, and Burlington Northern Santa Fe) on land owned by the provincial government, to be transferred to CentrePort. The second is a partnering of two Chinese companies (Shanghai Invent Logistic & Technology and Minsheng International Freight) with CN Worldwide and CP Logistics Solutions to export high-quality Manitoba agricultural products to China.

The Arctic Gateway: For two centuries, explorers, governments, and entrepreneurs have dreamed of the Northwest Passage. Today, one of Canada's transportation initiatives is the Arctic Gateway, which involves a wide range of additional efforts, from environmental and military undertakings to the protection of aboriginal peoples. The Arctic Gateway and Corridor is possibly the quickest sea connection between Europe and Asia and now forms a strategic supply chain for trade and commerce among a range of nations: the United States, Japan, the European Union, Norway, Canada, and Russia. The Northern Sea Route is opening connections to Asia via Canada's Arctic

Corridor. Indeed, the Arctic Gateway creates a potential trade route through the centre of North America, using the railroad that links Winnipeg to the Port of Churchill, operating since 1929, to ship goods at a reduced distance to Russia and key markets in Asia.

A recent Canadian Senate report, "Sovereignty and Security in Canada's Arctic," put forward a number of recommendations, including new fixed-wing search-and-rescue aircraft as the top military-procurement priority, as well as positioning equipment and personnel in Canada's North. Churchill was the military's major base, with a deep-sea port and airbase used by American B-52 bombers during the Cold War. Currently, the Canadian Forces rely on the Canadian Rangers, mostly indigenous local volunteers, in the North as first responders for search and rescue, with aircraft flying from distant Canadian Forces Base Trenton in Ontario.

The Arctic Gateway concept has the potential to turn Churchill into a major shipping port for Canada's North and possibly for bulk shipping to Europe. More specifically, the Arctic Gateway and Corridor is a new cross-border economic area, linking oil and gas sectors, mining, tourism, and environment to transport and trade development. It has developing transport links (including air cargo), high-quality infrastructure and supply services, and a politically stable and competitive business environment. The Arctic Corridor is a very high priority outside Canada, including in Kazakhstan in Central Asia, Russia, Alaska, and Norway. The Arctic has huge potential to link the Pacific Ocean to the deep-water ports around the Arctic Ocean and to the Baltic region.

The Pacific Gateway: For Canada's West Coast, the link to Asia dates from ships run by CP to Yokohama, Hong Kong, and Shanghai. More recently, the startling rise of the Asian economies—first Japan a generation ago, then Southeast Asia and the Asian Tigers, and now China—represents a tectonic shift in the global economy and huge opportunities to manage trade and container flows across the Pacific for all of North America.

The Pacific Gateway strategy around the ports of Vancouver and Prince Rupert is the most developed initiative for Canada's West Coast for goods from Asia. It has two attributes that are critical to future development and expansion. First, from the beginning, it has involved three levels of government: the federal government in Ottawa, the provincial government in Victoria, and the municipal governments in the two main ports, Vancouver and Prince Rupert, plus those of the surrounding towns and cities. The second unusual feature is that the three main stakeholders—governments, the private sector, and the unions—have acted as champions for development, not only for jobs but for expanded trade links. The two supply chains—one of transportation, one of corporate networks linking suppliers and customers—are intimately connected for customers and exporters, and these stakeholders know and understand the issues. For example, the West Coast has its own historic challenges, such as a reputation in Asia for strikes (though there has not been a strike action in a generation), antiquated facilities, and minimal security.

National policy has started to address the West Coast issue, with an investment package amounting to $591 million. British Columbia is now an extremely active player in Asia at all levels, with regular visits by the premier, cabinet ministers, and private-sector groups, and the Lower Mainland ports are integrated to form a new unified Port Authority. The province hosts an annual transportation conference of Pacific Gateway stakeholders to focus on challenges, priorities, and best-practice knowledge. Vancouver is clearly the main container port in Canada, and West Coast container shipments are projected to more than double, from about 2 million TEUs per year to 5 million TEUs by 2020.

However, a lot of assumptions remain about the second West Coast port, Prince Rupert. Here, first-nation land claims, port infrastructure, and terminal construction are closely watched around the world. Countries like Mexico see their own port development as possible competition for West Coast trade—perhaps because, with China as a partner, time is on Mexico's side if Canada's logistics players fail to seize the growing opportunities in the U.S. market.

Globally, Canada's constant challenge is to recognize that international trade is based on an ocean-going transportation system. Seaborne traffic covers about 96 percent of international trade. The containerized portion of traffic passed a milestone in 2004, with 360 million TEUs moving through the world's ports and up to 50,784,282 TEUs through North American ports. For Canada, the challenge now is to design a national transportation system that is state-of-the-art to deal with the world's biggest market, the United States, and that reinforces Asia's role in that competitive market.

BORDER SECURITY

7

"GOOD FENCES MAKE GOOD NEIGHBORS" is the motto for two close trading allies and a rallying call from President John F. Kennedy, then a senator, in a famous speech on Canada-U.S. relations. It is well known that the two countries have the most open border of any two trading partners in the world. The vast expansion of world trade across dispersed locations of production, marketing, finance, and IT make global value chains a new strategic-trade element that is largely dependent on public policy for security flows, infrastructure, and trade agreements. Canada's open border with the United States and relatively free movement of people was made more significant by the 1989 free-trade agreement and now amounts to more than $450 billion a year.

Interviews with key provincial and federal officials, border security experts, academics, and private-sector executives make two points about border flows, barriers, and costs:

- Post-9/11 security measures and barriers peaked around 2004, before senior officials from Canada and the United States entered into joint programs to reduce bureaucratic impediments and wait times so as to smooth the flow of goods by way of investments in border security measures.
- Despite huge trade flows between the two countries, many of the bottlenecks, delays, and wait times are now due mainly to infrastructure gridlock, not security problems. The Windsor-Detroit Bridge is a significant example often cited by shippers. Negotiations are under way to reduce this border delay.

Since the very founding of Canada, historians, journalists, and politicians have demonstrated its national preoccupation with the United States. That mindset is now more significant because of NAFTA, high dependence on the American market for most Canadian goods and services, and real and imagined border-security issues for the United States after the terrorist attacks of September 11, 2001.

As two-way trade between Canada and the United States accelerated after the free-trade agreement was signed—especially the growth of U.S. exports to Canada, far exceeding the annual growth rate of Canada's nominal GNP—superior alignment of corporate supply chains across North America led to greater productivity and lower costs, evidenced, for example, in the auto sector, where parts and components flowed across the border several times before the final assembly of finished cars and trucks. But since 9/11, careful analysis by academics, corporate bodies, and governments has showed ominous trends of "border thickening" or disruption of trade flows.

What issues are due to antiterrorist measures, imposed by the United States, and other actions that reflect changes in trade flows? Consider four:

- Costly border delays and interruptions caused by regulatory procedures that differ between Canada and the United States or between provinces and state regulatory agencies (as, for example, with food inspection)
- Congestion and traffic gridlock on roads and highways between Canada and the United States, precipitating delays, for instance, in the movement of trucks in the retail and auto sectors between Michigan and Ontario and on the Detroit-Windsor Bridge
- Shifts in production flows as a result of currency movements between the two countries
- Producing domestically, in the United States or Canada, goods that used to be imported from Asia (for example, parts and components from Japan and Korea, or assembled products from China)

These and other issues have led to new measures by the Canadian and American governments to assure a safe and secure border across 36 specific transit points. The 2001 Smart Border Accord and the three-nation Security and Prosperity Partnership in 2005 were attempts to coordinate security and border regulations, but they did little to improve cross-border efficiencies. The Beyond the Border Action Plan, announced in

late 2011, and the U.S.-Canada Regulatory Co-operation Council are more significant bilateral attempts to improve regulatory transparency between the two countries. This results in more security checks on the Atlantic and Pacific coasts, better harmonization of food standards and regulations, and more security for cargo, including prescreening of containers at ports and better-coordinated entry-exit flows.

Both countries are implementing border initiatives that establish a North American security perimeter. For instance, all containerized marine cargo that reaches Canadian ports, regardless of ultimate destination, is inspected by the new Canada Border Services Agency (CBSA). Today, 100 percent of inbound containerized cargo is screened through radiation detection portals that uncover radioactive materials that may pose a security threat. CBSA receives advance commercial information on all cargo so that health, safety, and security threats are identified before they arrive in Canada. The CBSA now also conducts risk-based, automatic-targeting analysis using both electronic carrier and cargo information 24 hours before ship loading at foreign ports. Other measures include expanding trusted traveller programs, as well as enhancing integrated law enforcement and cooperation for information sharing. As one prominent official states,

> This combination of off-shore screening, rigorous scanning at seaports and land border crossings, and regular detailed examinations of containers deemed to be high risk provides a multilayered and thorough security check for entry into the U.S. These efforts demonstrate that security at Canadian ports and border crossings are not in any way inferior to similar measures used in the United States.
>
> - *Robin Silvester,* President & CEO, Port Metro Vancouver and Chairman, Canadian Port Authorities

Additional initiatives include implementing the Shiprider program, a legal measure that will require amending the Criminal Code along with the responsibilities of the Royal Canadian Mounted Police (RCMP) in enforcing the Customs Act. This joint initiative, officially called Integrated Cross-Border Maritime Law Enforcement Operations, began as a pilot project, allowing RCMP and U.S. Coast Guard officers to operate vessels together in the waters of both countries.

Because trucks account for about 70 percent of two-way trade, both countries have taken significant steps through mechanisms like the Cross-Border Crime Forum, the Integrated Border Enforcement Teams (IBETs), and the bilateral Free and Secure Trade (FAST) program. Plus, many companies participate in the Customs-Trade Partnership Against Terrorism (C-TPAT). These initiatives have helped secure trade while speeding border processing, but some bottlenecks exist, especially in two-way trade in autos and auto parts in the Windsor-Detroit area, where the daily flow amounts to almost 25 percent of the annual merchandise trade between Canada and the United States.

The U.S. owner of the Ambassador Bridge has blocked approval of a new, second span, despite strong support from the state governor, the continuing efforts of both the Ontario and federal governments, and Canada's offer to fund Michigan's $550 million share of the new span (the money to be paid back through subsequent tolls). Removing this block will require intense collaboration by federal, state and province, and municipal officials on both sides of the border. Fortunately, the recent announcement of agreement on another new bridge will, over time, greatly reduce this troublesome bottleneck, especially for trucks carrying parts and components for the auto assembly plants in Ontario and Michigan.

Both Canada and the United States plan to deploy a land-based version of the Shiprider initiative: two next-generation pilot projects will establish integrated teams in intelligence and criminal investigations as well as an intelligence-led uniformed presence between ports of entry. In September 2011, U.S. Attorney General Eric Holder stated, "The creation of 'NextGen' teams of cross-designated officers would allow us to more effectively identify, assess, and interdict persons and organizations involved in transnational crime. In conjunction with the other provisions included in the Beyond the Border Initiative, such a move would enhance our cross-border efforts and advance our information-sharing abilities."

Both countries continue to expand the nature and scope of joint law-enforcement operations, along with intelligence collection and sharing. For instance, in April 2012 the Red River Integrated Border Enforcement Team opened in Altona, Manitoba, incorporating representatives from the RCMP, U.S. Border Patrol, Homeland Security, CBSA, and U.S. Customs and Border Protection. This IBET is a binational partnership designed as a pilot model for other border crossings along the U.S.-Canada border.

THE POLITICS OF THE NORTH AMERICAN GATEWAY PROJECT

8

THE GENERAL ECONOMICS OF THE NAG EFFORT look highly favourable. Capacity exists for expansion, little if any public financing is necessary, high-paying job growth would be ubstantial, and the impact on the environment and "green issues" would be minimal if the stakeholders—especially on the West Coast—reached consensus on issues like container ships versus oil tankers and port expansion for terminals and warehouses versus oil pipelines and oil spills. The benefits to consumers and gateway participants are great: lower prices, high-paying jobs, and steady employment. So what are the politics of the NAG effort? The word politics does not refer to partisan politics or party platform issues per se, but to the reality of multiple stakeholders, each with different goals, time horizons, performance metrics, legacy issues, and the capacity to voice their concerns.

Around the world, large infrastructure projects take time, often decades, to come to fruition. Some projects advance, but often many never do. Construction of the Channel Tunnel linking Britain with Europe was discussed before World War I but not begun until the 1990s. Consider some of the large infrastructure projects around the world that are success stories: the Panama and Suez Canals, the Erie Canal, the St. Lawrence Seaway, the James Bay Hydro Dam, the Hoover Dam, and the Confederation Bridge.

Globally, governments, entire industries, and individual companies are investing in infrastructure. The projects are as various as roads, subways, ports, electricity grids, water and sewer systems, pipelines, rail networks, highways, and satellite and telecommunication networks. In general, the reasons for investment are straightforward: vastly increased possibilities in world trade, better communication systems, and novel methods of financing projects, from private equity to P3s. But successful outcomes require focus, clear leadership, and project champions—all of these absent, often. Silo mentalities prevail. So does political gamesmanship.

Academic studies that have examined the politics of infra-structure projects reveal remarkably consistent results. Because of their size and scope, infrastructure projects are highly visible and usually provide immediate benefits to particular onstituents in the form of jobs and employment, impact on local land prices, and other advantages like increased availability of goods and lower cost of services. Another issue is the relative strength of one constituency against competing groups; the stronger side usually consists of highly concentrated actors with more money to spend, better access to critical information, and more robust communication strategies that enable them to receive net benefits for favourable outcomes over the less visible or more diffuse groups. In short, the politics of infrastructure illustrate the sensitivities of the main actors to achieving favourable outcomes, as well as the strategies and tactics employed to attain success through interest-group pressures, lobbying, and media strategies.

But there are other factors. In Western countries, more governments apply Keynesian principles of pump-priming and stimulus spending during downturns in the business cycle. Governments often use infrastructure investments in an attempt to create jobs (shovel-ready projects) that apply multiplier effects to private investment and thus create "public goods" for society at large. Examples are investments made in arts and culture organizations, subways, and improved water-and-sewer systems for municipal housing.

Although infrastructure spending generates political controversy, public infrastructure investments directly create

jobs but also beget a multiplier effect by building demand for materials, services, labour, and specialized equipment. Economic studies estimate that every $1 billion of infrastructure spending can generate up to 17,000 jobs directly and up to 23,000 jobs by means of induced indirect investment. For example, the U.S. Department of Transportation estimates that for every $1 billion invested in federal highways, more than $6.2 billion in economic activity results directly and indirectly. Less optimistic estimates—for instance, by Mark Zandi, chief economist at Moody's Economy.com—posit a multiplier effect in which every dollar of increased infrastructure spending generates a $1.59 increase in GDP.

Another factor, more widespread globally, is the rise of large urban agglomerations: many people live isolated from vast reserves of commodities, farmlands, oil and gas fields, and even water supplies. Infrastructure development is the basic means of moving goods and services to the population centres. (Of the 25 largest cities, with a population ranging from a minimum of 10 million to 37 million, 13 are in Asia.) In past centuries, trucking and national highway systems were the main means for domestic economies, but globalization and explosive increases in both world and interregional trade have greatly expanded the need for quality, low-cost physical nfrastructure—airports, passenger rail systems, nuclear power stations, pipelines, and electricity transmission. Each of these reflects a delicate balance of public financing and private investment by corporations.

The rise of China and India, which together represent about 40 percent of the world's population, illustrates the need for transportation infrastructure such as roads, railways, airports, subways, ports, electricity systems, and telecommunications. North America too has a long history of building infrastructure on a very large scale—for example, the St. Lawrence Seaway, the Alaska Highway, the Hoover Dam, James Bay, the transcontinental railways, and the Trans-Canada Highway system.

One of the most pervasive intrusions of politics into infrastructure and transportation is the system of cabotage, several centuries old in most countries. *Cabotage* is a transport term (from the French *cabot*, sailing near shores) referring to the movement of goods from A to B within a country, as well as the movement of goods from A to B by a domestically owned company.

Today, cabotage entails an extensive array of nontariff barriers such as laws, regulations, and interprovincial rules that reduce speed, raise costs, and inhibit clarity and reliability in transportation. Politics and the weight of political pressure groups apply to trucking, ocean, and short-sea shipping, but often extend to other fields such as defence, immigration, and, more recently, national security.

Today, infrastructure development and investment has become a highly partisan issue linked to the political arena. NIMBYism reflects a new dimension in the politics of infrastructure in which the benefits of a project may be small but spread through the population at large although the costs are born by a few in a focused political arena. Urban politics best reflect this phenomenon—for example, around airport development, where complaints of noise, air pollution, and road congestion are the signals to oppose development or expansion. Project approval can take years, involving representations from immediate stakeholders but often with interventions from secondary parties that can prolong the process even more.

Increasingly, infrastructure projects around the world combine new characteristics and attributes. They are very large, they possess technically complex engineering features, and they have multiple stakeholders: governments at different levels, individual groups with intense opinions, private-sector contractors, and international bodies as members or stakeholders. Pipelines in Canada, such as the Northern Gateway from Alberta's oil sands to the Pacific coast, or Keystone XL from Alberta to Texas, are case studies of the politics of infrastructure. In addition, their sheer size requires complicated financing terms for capital costs and financial operating arrangements, spread over very long periods (ten years or more). These attributes require complex organizational systems for project feasibility, project organization, and project completion. (See Exhibit 22.)

EXHIBIT 22: Framework for Large, Technically Complex Projects

Initial Phase	The politics of project proposals	Implementation
1. Early stakeholders	1. Stakeholder management	1. Ownership model
2. Technical somplexity	2. Timelines, scheduling;	2. Project management design
3. Tentative financing	3. Financing methods;	3. Financing model
4. Leadership champions	4. Technical design	4. Governance system
5. Time for completion		5. Stakeholder system
6. Private vs. Ggv't		6. Timelines
7. Governance		7. Transparency

Marshalling public opinion via media, political systems, and public goods

Source: BCG analysis

Politics often lead to a project's failure, or to delay that is severe enough to result in failure. Several external factors contribute to this outcome. Proponents have an unclear project definition, with vague real objectives and exaggerated goals. Cost overruns are likely. Technical analysis accompanies engineering uncertainty, which is tied to faulty coordination. The financial model—including total capital investments, source of financing, and financial risk (exchange rates, design specifications)—may be flawed. Projects can understate environmental and social risks such as likely impacts on the natural environment; ecosystems; animal habitats; soil, air, and water degradation; and the like. Project champions come from narrow vested interests, sometimes with limited government support. Some studies show a bias by promoters and forecasters who use Machiavellian tactics or inverted Darwinism to secure project approval. (See Exhibit 23.)

EXHIBIT 23: The Politics of Infrastructure Approval: Two Models

a) Machiavelli's Formula

(Underestimating Costs)
+ Overestimating revenues
+ Undervalued environmental Impacts
+ Overvalued development effects
= Project approval

b) Inverted Darwinism

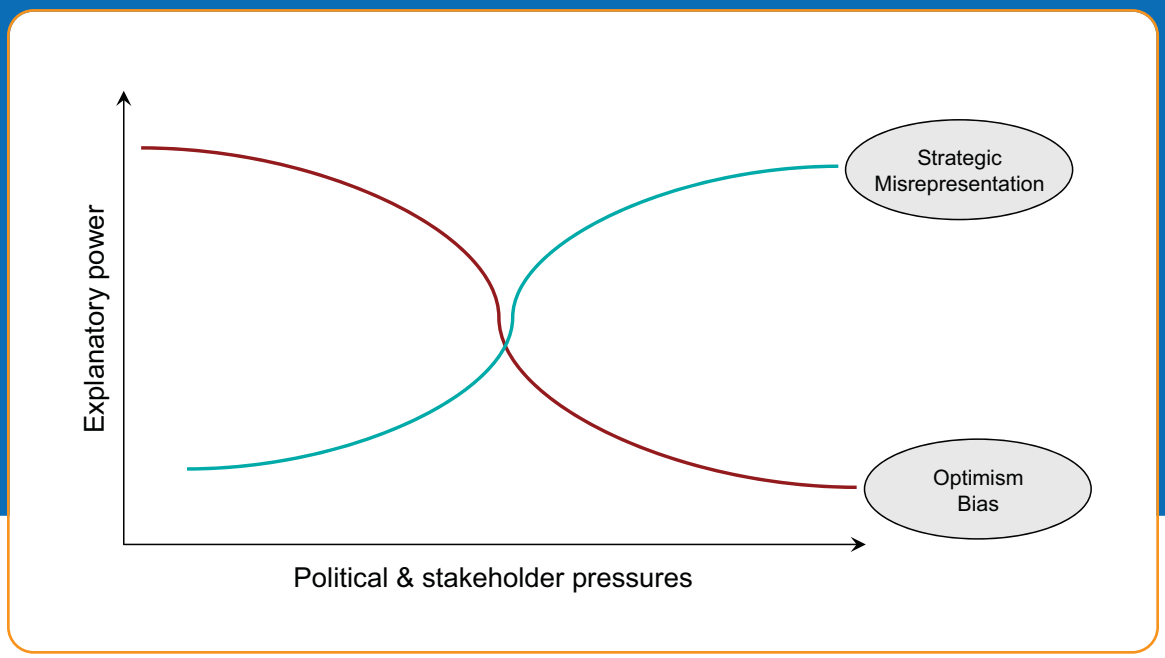
(Max (B/C) at Approval)
= Max (benefit shortfall,
cost overrun at implementation
= Max (size and frequency of disasters)
= Survival of the unfittest

Source: Flyvberg (2005)

Internally, many infrastructure programs suffer from organizational problems. Strategic management issues include inadequate scheduling, metrics, performance reviews, role definitions, legal forms (single-group versus consortia), and finance controls, such as transparent budgets, accountability, spending discipline, and clear timelines. Management of large projects requires special modes of team leadership, labour relations sensitivity, project spokesmen, and media savvy (including language skills). Then there are general uncertainties, such as contingent budgeting, acts of God, human error, incompetence, and technical and engineering incapacity.

Many large infrastructure projects—with multiple stakeholders, vested interests, and the massive uncertainties of real project costs—fail, or at least experience long delays. Huge cost overruns are likely, delays are inevitable, and approval bodies have limited resources to assess realism in model forecasts. Even worse, the cycle of weak accountability, initial optimistic appraisal of viability by stakeholders, and deception about actual outcomes can derail public support over time, but not before the project gains approval from regulatory bodies. (See Exhibit 24.)

EXHIBIT 24: Reasons for Forecasting Errors, Cost Overruns, and Delays



Source: Flyvbeg 2004

Institutional management arrangements—making or approving decisions versus actually managing the risk by dealing with, for example, turnover in personnel, governments, and managers—can also put projects at risk. So can decoupling of cost burdens, focused benefits, and risk management.

By their nature, global supply chains require physical infrastructure: ports, seaways, rail track, highways, and all the tools of the digital age, from traffic signals to smart tags and customs clearance tools. Large projects require vision and champions. Vision is an outlook toward the future. Champions are leaders who can mobilize public opinion and institutional inertia. Canada has a strong track record in vision and champions. Indeed, Canada itself in 1864 was a vision of the leaders of the separate British colonies.

For more than 125 years, Canada's champions have cultivated willpower and public opinion and have overcome international inertia to fight two world wars and build a transportation and communications system across the second-largest landmass in the world. The results are often taken for granted domestically, yet they astonish people from foreign countries: two transcontinental railways, a national highway system, the St. Lawrence Seaway, ports along the Great Lakes, huge power dams on the Columbia River and James Bay, nationwide pipelines, the Confederation Bridge, and a national broadcasting system that combines radio, television, the Internet, overseas networks, and links to small, distant, rural communities in Canada's two official languages.

Like all large infrastructure projects, the NAG requires grand vision and national champions. Champions must come from the worlds of politics and business, from unions, from federal and provincial bureaucracies, and even from the ranks of everyday citizens. Champions mobilize the public narrative with a clear and compelling vision of the future that uses data, job opportunities, and wealth creation for regions and the country at large, and that maintains an environmentally friendly footprint. By sheer size and scope, the NAG needs champions in the transportation industry but also from among many other related stakeholders in order to position Canada in the global economy.

CONCLUSION: NEXT STEPS FOR THE NORTH AMERICAN GATEWAY

9

CANADA HAS A ONCE-IN-A-GENERATION opportunity to become a transportation leader with the creation of the NAG. On both the East and West Coasts and in important corridors between them, Canada's transportation infrastructure has the asset capacity and the electricity grids, roads, and telecommunications to place this country on the global trade map, especially in the growth markets of Asia.

Canada's opportunity occurs in a time of growing transportation congestion in the United States and massive uncertainties in the American public-policy arena resulting from political gridlock. But this situation is only a temporary advantage— perhaps a period of three to four years— before pressure builds to make the necessary infrastructure decisions. Canada must take the lead, and the public-policy framework must incline toward action with clear benchmarks, not time-consuming consultative mechanisms. Past experience, particularly with the Pacific Gateway, shows that leadership and champions can come from all three levels of government and from the private sector, including groups in the labour and environmental movements.

But the creation of the NAG will not be a "natural event." It must be made to happen. As such, impediments to success can be expected. Interviews conducted for this investigation across Canada and with important executives in the United States show the enormous potential of the NAG for both countries. Although the general public is unaware of the flow of goods and services produced in Canada or from abroad, it does have a good sense of pricing and of the ability to choose among many foreign products, as witnessed by cross-border shopping for consumer goods in the United States. And so do politicians, who face voter wrath for high prices.

Indeed, Ottawa has lifted the ceiling on duty-free goods for travellers who enter Canada. Beginning June 1, 2012, Canadian residents have benefited from higher personal exemptions of $200 (CAD) for absences of 24 hours or more, and $800 for absences of 48 hours or more, imported free of duties and taxes.

But few Canadians are aware of how much logistics and transport actually account for the total costs of goods sourced from aboard. These costs are likely to become more of an issue as traffic and transportation congestion exacerbates the expense of moving imported goods from Europe and Asia to Canada and the United States, raising prices and diminishing choice. And growth in global online shopping will only augment the need for quality infrastructure.

In a nutshell, the following together constitute a unique opportunity for the creation of an NAG:

- Timing, as there is widespread understanding of gridlock issues within the United States
- Recognition that there is real competition from other global entities
- Logistics costs
- Rising trade flows in Asia that are forcing North America's response

The NAG holds immense possibilities for Canada: high-paying jobs, new technologies, and new forms of corporate collaboration. Canadian companies along the global supply chain—exporters, manufacturers, retailers, shippers, terminal operators, ocean ports, airport authorities, railways, trucking firms, and senior transportation officials at the federal, provincial, and municipal levels—are well aware of the need to be ahead of the competition to gain an edge for Canada. Even with the best of intentions in the political realm, burgeoning congestion in the United States cannot be solved

quickly. Canada's opportunity, in practical terms, requires a clear understanding of the importance of Canada's trade position, the need to link transportation issues with trade flows, and the necessity of positioning the country for future developments in overseas markets, especially as there is a likelihood of new free-trade arrangements with the European Union, Japan, and the Trans-Pacific Partnership in Asia.

Canada's various gateway initiatives, numerous consultation meetings, industry conferences, and trade shows, as well as academic, industry, and government studies, have produced widespread consensus on the openings, the challenges, and the impacts for Canada: job creation; the strengthening of Canadian companies, both as importers and exporters; incremental but important rebuilding of Canadian infrastructure; sustained and ongoing improvements in U.S.-Canada border security; and tools for advanced screening and to aid law enforcement agencies.

Further, the extent of Asia's importance in the global economy, which now includes Canada-China trade relations, has shifted the mindset of leading Canadian companies involved in the global supply chain. Any visit to new Chinese ports like Shanghai or to leading Asian ports like Singapore or Yokohama, Japan, reveals that Asia is not standing still. Indeed, even comparing the United States with Canada on the Logistics Performance Index (published in "Connecting to Compete: Trade Logistics in the Global Economy"), in which six indicators are scored to provide an international ranking, the United States scores 10 and Canada 14. On the six dimensions —customs clearance, infrastructure, logistics competence, tracking and tracing, pricing of shipments, and timeliness—the United States surpasses Canada by marginal differences, except in tracking and tracing (4.11 for the United States, 3.86 for Canada). Previous surveys show that the same top ten countries scored highest in the latest survey, indicating that supply-chain and logistics firms are not resting on their laurels.

The NAG may evolve as international and global circumstances dictate, but it could take some time and it may not evolve on Canadian terms. Interviews reveal that many key executives, and perhaps Canadians at large, remain in an intellectual time warp in which the domestic market dictates policy frameworks based on local and regional interests, not on international opportunities and new thinking. Canada may also become a captive to foreign strategies, foreign interests, and even foreign ownership of key players. So what are the obstacles? Three are central:

- Complacency in waiting to see who will take the lead
- A "go-it-alone" attitude toward roles in the supply chain
- A postrecession "wait-and-see" mindset

The word *complacency* came up in many interviews. Some call it the "culture of contentment." By any standard, the Canadian economy is doing better than the economies of most countries, and despite manifest problems in areas like productivity and innovation, Canada looks comparatively good. Political polls reveal relatively high satisfaction levels of personal wellbeing across the country. Even on the issue of infrastructure, where recent polls show marked concern about its quality (highest among older people, lowest among younger Canadians), the main worry is over roads, highways, and commuter time, not issues of international trade infrastructure.

A far more complicated obstacle to advancing the NAG initiative is the "go-it-alone" attitude among some senior executives. In certain sectors, some firms are the industry leaders not only in the Canadian economy but in all of North America. The reaction is this: "Why get involved in an initiative

that is good for Canada, good for job creation, good for collaboration across the supply chain, but that might jeopardize our lead in our sector? We are ahead; we want to stay ahead. This initiative takes management time, consultation effort, and possible new IT investment." Better to go it alone.

Go it alone also means that many players along the supply chain are content to optimize their positions only. Interest in joining forces with others in their supply chain is weak and must be stimulated. This circumstance may require a "shuttle diplomacy" where key players are consulted with individually and one or more summits are held to bring players together to engender the desire to collaborate.

A related but different obstacle is the "wait-and-see" reaction, in part a reflection of the North American economic slowdown and the relief it has given to the worst pressures of transportation congestion. Incremental investments and more cooperation with immediate customers are the natural business response to the reduction in demand pressure on ports, railways, and other parts of the supply chain. This acceptance of "more of the same" is natural, but not a strategic response to the congestion crisis facing North America or the real pressures that are readily predictable from globalization and the rise of Asia in the global economy.

How best to proceed? The NAG has a hierarchy of benefits to key stakeholders, starting with customers and the public at large. That is why there is a role for government, not as an investor or a source of taxpayer money, but as a catalyst and a champion of the NAG. Retailers, shippers, and exporters are big winners with the NAG because they offer a pull factor of superior consumer choice, lower prices, and containment of logistics costs. But the transportation players in the global supply chain also gain immensely in rising demand for their products and services, as well as better control over demand volatility, reliability, and timing.

METHODOLOGY OF THE INVESTIGATION

APPENDIX A

Our general approach to investigating the NAG opportunity involved collecting data and analyzing and synthesizing various government reports, academic studies, consulting papers, and sundry other materials in the vast literature on ports, gateways, corporate supply chains, and transportation studies to develop a coherent assessment of the project.

We also extensively interviewed participants in the global supply chain, officials at all levels of Canadian government, transportation experts, and leading academics who are familiar with the issues in Canada, North America, Europe, and Asia. This preliminary work provided the tentative framework, shown in the Exhibit here, for detailed interviews with over 70 senior executives in Canada and the United States as well as three Asia Pacific Foundation of Canada board members. Some interviews were repeated. Confidentiality was promised for statements, opinions, and criticisms.

EXHIBIT 25: What We Did

Sector/ geography	Experts	Governments	Service providers	Shippers
Atlantic 10 Interviewees		• 1 - Political leader • 1 - Former political leader • 5 - Senior bureaucrats	• 2 - Port authority	• 1 - Food exporter
Montreal 10 Interviewees	• 1 - Transportation & logistics expert	• 1 - Former political leader	• 2 - Railroad • 1 - Engineering & construction • 1 - Port authority • 1 - Airport authority	• 1 - Construction • 2 - Industry association
Ottawa 10 Interviewees		• 9 - Senior bureaucrats	• 1 - Port association	
Toronto 13 Interviewees	• 1 - Border security expert	• 1 - Former senior bureaucrat • 3 - Senior bureaucrats	• 1 - Railroad • 1 - Shipping company • 1 - Port authority • 1 - Freight forwarder • 1 - Association	• 2 - Major retailers • 1 - Industry association
Wpg/Calgary/ Vancouver 22 Interviewees	• 3 - Transportation & logistics experts • 1 - Institute	• 1 - Senior bureaucrat • 4 - Former political leaders	• 2 - Railroad • 1 - Port authority • 1 - Airport authority • 1 - Ship owner • 2 - Associations • 2 - Lawyers	• 4 - Manufacturers
United States 5 Interviewees			• 1 - Supply chain collaboration systems	• 2 - Manufacturers • 2 - Retailers

Source: BCG analysis

The general starting point to stimulate thinking in the interviews was the following question:

How can Canada gain a First-Mover Advantage to be the North American Gateway (NAG) for the flow of commerce from Asia and Europe for all of North America?

Canada has unique advantages as were surfaced in these talking points:

- The fact that the Pacific Gateway, the Atlantic Gateway, and even the Arctic Gateway are already in motion
- Political capacity to mobilize stakeholders and government partners
- Daunting problems in the United States: gridlock from lack of investments, social concerns (NIMBYism) and dysfunctional politics, and limited available money
- A national history of P3s and huge pools of capital that can reduce or even eliminate the need for direct government spending
- Existing transportation infrastructure east-west as well as north-south.

The NAG project is multimodal, has a long time horizon, and requires consideration of the following:

- Containers and bulk ports
- Rail and highways, airports and airways
- High-speed passenger rail, 4G telecommunications, and state-of-the-art training
- The fact-based economics of infrastructure
- The fact-based politics (involving multiple stakeholders) of infrastructure
- Lessons learned from the success of other large infrastructure projects: the Erie Canal, the St. Lawrence Seaway, the Fixed Link, the Alaska Highway, the Internet)
- Lessons learned from the problems encountered with the Churchill Falls hydroelectric power station

Our investigative approach entailed historical review of large projects (successes and failures, expected and unexpected costs, and analysis of key drivers, costs, and motivations across the life cycle of projects, from inception to completion):

- In-depth interviews of key stakeholders, combining qualitative assessments plus fact-based indicators
- Review of studies and projects
- Pursuit of a clear focus on the economics (costs and productivity) of infrastructure
- Pursuit of a clear understanding of the politics of infrastructure from multiple stakeholders (for example, timing versus delay, preliminary projected costs versus full costs, unexpected costs)

Our investigation had a two-part timeline:

- First phase: five to six months
- Second phase: four months

Related Issues:

- The need for a National Advisory Board to help guide the investigation and to test key findings and frame conclusions
- The relationship between what *should* happen (according to data analysis and forward planning, based on the economics of infrastructure development) and what might happen (based on the politics of infrastructure)
- A national media plan to sell the investigation recommendations

BIOGRAPHY: CHARLES J. MCMILLAN

Charles J. McMillan, Professor of Strategic Management, York University, is the author of nine books related to international business and global management, including the Japanese Industrial System, published in English, Japanese, Malaysian and Russian editions, and his new book, *The Strategic Challenge: From Surfdom to Surfing in the Global Village*. He has written and lectured extensively on globalization in such prestigious academic journals as McGill Law Review, Academy of Management Journal, Journal of Business Strategy, Management, Canadian Public Policy, Ivey Business Journal, California Management Review, Policy Options, Canadian Public Administration, as well as in such publications as The New York Times, Nihon Keizai Shimbun, the Central Asia Post, Halifax Chronicle-Herald, The Globe and Mail, The National Post and The Toronto Star. In 2007, he was awarded a Fulbright Fellowship at Brandeis University, International Business School.

Active in public affairs and public policy, he has worked extensively with national and provincial governments across Canada, and served as Senior Policy Advisor to the Prime Minister of Canada. He is the author of *Focusing on the Future: The New Atlantic Revolution*, issued by the Council of Atlantic Premiers; and The Atlantic Gateway and Canada's Trade Corridors, available from the Asia Pacific Foundation of Canada. His latest book, published in the fall of 2007, now in a second printing, Eminent Islanders, received a Heritage Foundation of Prince Edward Island award on February 18, 2008.

BIOGRAPHY: GEORGE STALK

George Stalk is a Toronto-based senior advisor of The Boston Consulting Group. Since 2008, he also has been a BCG Fellow, which allows him to spend significant time developing thought leadership on a topic that will create value for the firm's clients. Outside of BCG, he serves as an adjunct professor of Strategic Management for the Rotman School of Management at the University of Toronto, is a Fellow at the Strategic Management Society and the Asia Pacific Foundation and is a member of the board of directors Intuitive Surgical, Inc.

George is the co-author of three best-selling books on time-based competition, *Competing Against Time, Kaisha: The Japanese Corporation and Hardball: Are You Playing to Play or Playing to Win*. His articles have been published by many leading publications including *Harvard Business Review*, where one of his features won the McKinsey Award for being the best of its year. He writes a monthly column for the *Globe and Mail* in Toronto and speaks regularly to business and industry groups. BusinessWeek identified him as one among a new generation of leading management gurus. Consulting magazine named him one of the industry's Top 25 most influential consultants in 2000, 2001 and 2002.

He holds a BS in engineering mechanics from the University of Michigan, an MS in aeronautics and astronautics from Massachusetts Institute of Technology and an MBA from Harvard Business School.

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