

# Chapter 6: Critical Infrastructure Protection

Canada, Mexico and the United States share much of their critical infrastructure. Although a pandemic threatens the health of workers, as opposed to causing physical damage to systems, worker absenteeism could disrupt the efficient flow of critical goods and services. For example, critical workers sustain the flow of electricity as well as natural gas and petroleum. These critical goods and services are part of a vast, interconnected system serving all of North America. Beyond energy and power, other critical infrastructure and key resource (hereafter, critical infrastructure) sectors, from manufacturing operations to transport, banking systems to food delivery service, could also be affected. Moreover, a pandemic could significantly interrupt the ability of private and government-owned businesses to sustain critical infrastructure.

To reduce the negative effects of a pandemic on North American critical infrastructure, Canada, Mexico and the United States intend to make every reasonable effort to coordinate before, during and after a pandemic; to establish a mutually supportive operating environment; and to assist one another in improving the resiliency of critical infrastructure in the face of the pandemic threat. Once established, this operational framework is intended to be applicable to critical infrastructure sectors, as well as to all publicly and state-owned businesses in general.

Business continuity planning is recognized internationally as a key method of providing for the continuous delivery of essential services and products during disruptions and is vital to the building of resilient infrastructure. All critical infrastructure sectors, and indeed all enterprises, large and small, public and private, including government institutions, should strive to maintain critical operations during an influenza pandemic. The three countries intend to promote business continuity planning in their public and private sectors as a key method of mitigating the impacts of pandemic influenza, providing for continuous service delivery and laying the groundwork for rapid recovery.

While the potential impacts of an avian influenza outbreak may not be on the same scale as pandemic

influenza, contingency plans should be developed to minimize and limit the economic consequences. The ability to control animal movement, eliminate infected and exposed susceptible populations and do more effective general surveillance allows authorities responsible for animal health to respond more effectively to disease outbreaks and minimize the risk to the human population.

## The SPP Framework

A collaborative North American approach emphasizing and supporting critical infrastructure planning, preparedness, response and recovery processes is fundamental to the proper functioning of these essential systems within and across borders during a pandemic. This Plan is intended to be consistent with the efforts undertaken as part of the North American emergency management framework “to develop a common approach to critical infrastructure protection, [and] to coordinate responses to cross-border incidents.”<sup>1</sup>

Major interdependencies among Canada, Mexico and the United States include the following:

- Canada and the United States are each other’s largest trading partners, moving over \$1.9 billion (USD) worth of goods and services across the border every day;<sup>2</sup>
- Mexico is the United States’ third-largest trading partner, with nearly \$300 billion in bilateral trade between the two countries;<sup>3</sup>
- Every year, the United States supplies Mexico with millions of gallons of water from the Colorado

1 <http://www.whitehouse.gov/news/releases/2006/03/20060331.html> or <http://www.pm.gc.ca/eng/media.asp?id=1085>

2 [http://geo.international.gc.ca/can-am/washington/trade\\_and\\_investment/trade\\_partnership-en.asp](http://geo.international.gc.ca/can-am/washington/trade_and_investment/trade_partnership-en.asp)

3 [www.census.gov/foreign-trade/balance/c2010.html#2006](http://www.census.gov/foreign-trade/balance/c2010.html#2006) and [http://mexico.usembassy.gov/mexico/trade\\_info.html](http://mexico.usembassy.gov/mexico/trade_info.html)

River and the Rio Grande, while Mexico provides the United States with water from six Mexican tributaries to the Rio Grande;<sup>4</sup>

- Canada provides approximately 85 percent of U.S. net natural gas imports<sup>5</sup>, and the United States and Canada supply nearly all of each other's electricity imports, and;<sup>6</sup>
- U.S. imports of Canadian agricultural/food products total more than 20 percent of total U.S. agricultural/food imports, while Canadian imports of U.S. agri-food products account for more than 70 percent of Canadian agri-food imports.

## Critical Infrastructure Sectors

Critical infrastructure encompasses those systems and assets so vital to a country that interruption or destruction would have a debilitating impact on national security, economic security, and/or national public health, safety or collective morale. Critical infrastructure protection entails all the activities, including prevention/mitigation, preparedness, response and recovery, directed at enhancing the resilience of people, systems and physical infrastructure associated with the operations of those critical infrastructure sectors and their provision of essential goods and services. As federal states, each country organizes its infrastructure and its critical infrastructure sectors differently, and each therefore has a unique relationship with the privately and government-owned critical infrastructure businesses within these sectors. The United States has formally detailed the identification and protection of what it refers to as critical infrastructure and key resource (CI/KR) sectors. Currently, Canada and Mexico are finalizing similar approaches. Identification of critical infrastructure sectors is based on a practical understanding of how these systems work and their critical importance to a given country's national economic and social stability.

### United States

In the United States, the private sector owns and operates an estimated 85 percent of the country's critical infrastructure. Therefore, sustaining the operations of critical

infrastructure during a pandemic, as well as the operations of those businesses that support the nation's CI/KR, will depend largely on each individual organization's development and implementation of business continuity plans tailored to pandemic-related impacts, including potentially severe staffing shortages, supply-chain disruptions and the degradation of essential services.

The U.S. Government<sup>7</sup> identifies 13 critical infrastructure sectors and four key resource sectors, 17 CI/KR sectors in all, that are essential to U.S. security as well as to economic and social stability:

### Critical Infrastructure

Banking & Finance  
Chemical & Hazardous Materials  
Defense Industrial Base  
Emergency Services  
Energy  
Food & Agriculture  
Information Technology  
National Monuments & Icons  
Postal & Shipping  
Public Health and Healthcare  
Telecommunications  
Transportation  
Water

### Key Resources

Commercial Facilities  
Dams  
Government Facilities  
Nuclear Power Plants

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7 As part of the U.S. Government's pandemic preparedness strategy, the Department of Homeland Security (DHS) helps support the public and private CI/KR sectors in developing and implementing their essential pandemic contingency plans. The Pandemic Influenza Preparedness, Response and Recovery Guide for Critical Infrastructure and Key Resources was developed to assist business owner-operators and their contingency planners with enhancing their pandemic planning. The primary purpose of this CI/KR guide is to encourage the U.S. private sector to act now. With this CI/KR guide, DHS has provided a comprehensive tool for the 17 CI/KR sectors in the United States, and for business and industry in general.

4 [www.ibwc.state.gov/html/colorado\\_river.html](http://www.ibwc.state.gov/html/colorado_river.html)

5 [http://geo.international.gc.ca/can-am/main/right\\_nav/natural\\_gas-en.asp](http://geo.international.gc.ca/can-am/main/right_nav/natural_gas-en.asp)

6 [http://geo.international.gc.ca/can-am/main/right\\_nav/electricity-en.asp](http://geo.international.gc.ca/can-am/main/right_nav/electricity-en.asp)

## Canada

Canada's critical infrastructure consists of the physical and information technology facilities, networks, services and assets essential to the health, safety, security or economic well-being of Canadians, or to the effective functioning of government. Disruptions of these critical infrastructures could result in catastrophic loss of life, adverse economic effects and significant harm to public confidence. As in the United States, most of Canada's critical infrastructure is owned and operated by the private sector, which therefore bears primary responsibility for the development and implementation of business continuity plans tailored to pandemic-related impacts, including potentially severe staffing shortages, supply-chain disruptions and the degradation of essential services. The provinces and territories also have a significant jurisdictional role in critical infrastructure protection and emergency management, as well as a role as owners and regulators of critical infrastructure.

As the approach to critical infrastructure protection varies across federal/provincial/territorial jurisdictions with respect to the laws and plans that are in place, so too does the classification of critical infrastructure by sector. While recognizing that each province and territory structures its critical infrastructure program as it deems appropriate, Canada classifies critical infrastructure within 10 sectors. This approach allows critical infrastructure partners to have a stronger awareness of risks and interdependencies, which will lead to better risk management. Critical infrastructure partners are able to collectively respond to risks and target limited resources to the highest priority areas.

The 10 sectors are as follows:

- **Energy and Utilities** (e.g., electrical power, natural gas, oil production/transmission)
- **Information and Communications Technology** (e.g., telecommunications, broadcasting systems, software, hardware and networks including the Internet)
- **Finance** (e.g., large-value payments system, securities clearing and settlement systems)
- **Health Care** (e.g., hospitals, blood-supply facilities and pharmaceutical manufacturers)

- **Food** (e.g., safety, distribution, agriculture and food industry)
- **Water** (e.g., drinking water and wastewater management)
- **Transportation** (e.g., road, rail, marine, and aviation)
- **Safety** (e.g., chemical, biological, radiological and nuclear safety, dangerous goods, search and rescue, emergency services and dams)
- **Government** (e.g., services, facilities, information networks and key national monuments)
- **Manufacturing** (e.g., defense industrial base, chemical industry)

## Mexico

The *U.S.-Mexico Border Partnership Declaration*, signed on March 22, 2002, in Monterrey, Mexico, provided both countries with the basis to develop the *Framework of Cooperation for Critical Infrastructure Protection (CIP)*.

Under this framework, the governments of Mexico and the United States share the commitment to protect their populations and critical infrastructure from terrorist attacks, natural disasters and any another eventuality that may compromise their integrity and operation. The protection of the critical infrastructure network on the border – taking into consideration the interdependency between the two countries, and vulnerabilities – represents challenges and opportunities for both countries.

Even though Mexico and Canada do not share a border, these two countries recognize that critical infrastructure protection is important in a North American context. For this reason, both countries will explore opportunities for collaboration through the Mexico-Canada Working Group.

For the purposes of the Plan, Mexico defines critical infrastructure as those assets, services and networks that are indispensable to the support and maintenance of the well-being of the Mexican population. Following the concept stated by the U.S.-Mexico CIP, Mexico has established sectoral working groups to evaluate and improve the protection of critical infrastructure within its territory.

In this context, Mexico's approach includes eight sectoral working groups: Energy, Telecommunications, Transportation, Water and Dams, Public Health, Food & Agriculture, Cyber Security and Strategic Facilities.

To protect its critical infrastructure and with an eye to taking advantage of existing programs and resources, the eight sectoral working groups correspond to each CIP sector identified.

- **Energy** (e.g., Storage and Generating Facilities & Distribution Networks)
- **Telecommunications** (e.g., Telecommunication Networks)
- **Transportation** (e.g., Ports of Entry)
- **Water and Dams** (e.g., Hydraulic Infrastructure and Bridges)
- **Public Health** (e.g., Epidemiological Surveillance)
- **Food & Agriculture** (e.g., Animal Health & Epidemiological Surveillance)
- **Cybernetic Security** (e.g., Communication and Information Networks)
- **Strategic Facilities** (e.g., Physical Protection of Strategic Facilities)

## Improving Critical Infrastructure Resiliency

Sustaining interdependent critical infrastructure operations demands commitment, mutual support and collaboration from all relevant public and private sector critical infrastructure protection partners. The input of the private sector will be vital in Canada and the United States, where up to 85 percent of critical infrastructure is owned and operated by the private sector. While businesses and local communities are at the forefront of the response to and recovery from a pandemic, governments should maintain situational awareness of critical infrastructure to identify potential problems. Where appropriate, governments should coordinate timely national, regional and local support among appropriate public and private sector resources.

Canada, Mexico and the United States are to endeavor over the medium term and within the context of current resources to accomplish the following objectives. Reasonable efforts should be made to include the expertise of private sector infrastructure owners and state/provincial/territorial governments.

## Joint Assessments of Risks and Interdependencies

In each country, critical infrastructure sectors depend on one another for sustaining the flow of essential goods and services. For example, the U.S. water sector is indispensable to most, if not all, other sectors, but it, too, relies entirely on the energy sector to power its equipment operations, the transportation sector to deliver critical supplies and the chemical sector to treat the water supply. Given these interdependencies, disruptions to critical infrastructure lead to cascading consequences that may rapidly escalate within a sector (e.g., the August 2003 North American blackout<sup>8</sup>) and may cause significant cross-sector disruptions. In a pandemic situation, understanding these critical infrastructures and interdependencies among sectors will be fundamental to providing a coordinated cross-sector response.

The countries intend to develop mutually acceptable risk, vulnerability and interdependency assessment procedures and methodologies. The countries also intend to undertake joint and/or coordinated risk assessments. An important output of these assessments would be the identifications of interdependencies, potential choke-points and potential single-point failures within and across critical infrastructure sectors. Occurring within individual businesses or small numbers of like businesses, single-point failures can be triggered when a component on which a system or an operation depends fails and has no alternate component to back it up or take its place. Any number of vulnerabilities, including those caused by interdependencies and single-points of failure, may increase the probability for cascading consequences across sectors. To the greatest extent possible, any joint risk, vulnerability and interdependency assessment should occur prior to a pandemic outbreak to enhance compatibility and to share knowledge of differences in each country's approach to critical infrastructure protection.

8 The 2003 North American Electrical Blackout: An Accidental Experiment in Atmospheric Chemistry, [www.atmos.umd.edu/~russ/BlackoutFinal.pdf](http://www.atmos.umd.edu/~russ/BlackoutFinal.pdf)

## Publicly And Privately Owned Businesses With International Operations

The countries are to make every reasonable effort to examine essential North American critical infrastructure businesses with international operations. With the enactment of the *North American Free Trade Agreement (NAFTA)*,<sup>9</sup> the three countries formed a free-trade area with a total gross domestic product (GDP) of more than \$11 trillion (USD) in 2004. NAFTA has also resulted in growing numbers of companies located in the United States,<sup>10</sup> Canada and Mexico operating key facilities within the borders of one of the other two countries. These North American businesses increasingly function as a “borderless” North American commercial network. They represent another element of strength and vulnerability, since disruptions of these businesses could lead to cascading effects across each country.

## Borders

The three countries are to make reasonable efforts to coordinate border actions to sustain critical infrastructure. Borders represent a significant vulnerability to the countries’ interdependent critical infrastructure sectors because where cross-border movement is restricted, supply chain and personnel movements can be significantly disrupted. Thus, they may represent chokepoints that may negatively affect international commerce. Given the significant degree of North American integration, the agri-food sector is particularly vulnerable to disruptions in cross-border trade, as there is significant cross-border movement in key farm inputs, intermediate agricultural products and final food products.

## Impact of Disease versus Impact of Border Disruptions

The three countries’ border actions should be well coordinated and communicated with critical infrastructure businesses, and should be carefully managed for the health and safety of citizens while minimizing economic disruption to the extent possible, given legal requirements relating to animal health, plant health and food safety.

9 NAFTA: [www.ustr.gov/Trade\\_Agreements/Regional/NAFTA/Section\\_Index.html](http://www.ustr.gov/Trade_Agreements/Regional/NAFTA/Section_Index.html)

10 NAFTA: A Decade of Strengthening a Dynamic Relationship, [www.ustr.gov/assets/Trade\\_Agreements/Regional/NAFTA/asset\\_upload\\_file606\\_3595.pdf](http://www.ustr.gov/assets/Trade_Agreements/Regional/NAFTA/asset_upload_file606_3595.pdf)

## Critical Infrastructure Pandemic Preparedness and Response Management

The following are priority measures necessary to establish a mutually supportive environment and to improve the resiliency of the three countries’ publicly and privately owned critical infrastructure businesses during a pandemic:

- **Critical Infrastructure Pandemic Preparedness and Planning:** Canada, Mexico and the United States should promote the development, implementation and sharing of planning processes to bolster critical infrastructure resiliency and preparedness among all critical infrastructure sectors, as well as among the appropriate public and private sector businesses that support these sectors.
- **Pandemic Contact Lists:** The countries should develop contact lists of all appropriate key critical infrastructure public and private sector partners in order to improve coordination among all partners domestically and internationally during a pandemic. These lists should be updated regularly, perhaps annually, and should also include clearly established communications roles and responsibilities.
- **Shared Pandemic Risk Communications:** The three countries should facilitate the coordination of shared pandemic risk communications strategies among all public and private sector critical infrastructure security partners within their own countries. The need for timely, accurate, credible and consistent information that is tailored to specific audiences is extremely important and is described more fully in Chapter 2.
- **Collaborative Monitoring and Information Sharing for Pandemics:** The three countries should carry out appropriate actions for collaborative monitoring and effective information sharing for pandemics. Government officials and business leaders cannot now effectively predict or quickly identify the options to prevent single-point failures or cascading consequences. Canada, Mexico and the United States should explore the existing information-sharing mechanisms and develop a new collaborative system to monitor the most critical

elements of the critical infrastructure. To protect sensitive information, the three countries intend to seek proper information-sharing protocols that respect existing protocols and legislative provisions.

- **Shared Pandemic Exercises and Training:** To the best of their abilities, the three countries are to endeavor to include an array of relevant public and private sector critical infrastructure partners and appropriate public health officials in their pandemic preparedness training and exercises to help uncover potential weaknesses in established systems and to forge bonds among personnel. The SPP countries are to make reasonable efforts to conduct bilateral and trilateral training and exercises related to pandemic preparedness and response with representatives of critical infrastructure sectors.