



# Port Operations Centre

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## Port Description

The Port of Halifax is a full-service port, and offers a variety of facilities for bulk, breakbulk, ro/ro and container cargo, as well as modern cruise facilities. Halifax is Canada's fourth largest container port by volume, with operations located in its South End and Fairview Cove container terminals.

The Port of Halifax benefits from having some of the deepest berths on the east coast of North America, capable of accommodating the largest vessels that cross that Atlantic Ocean. Closer to Europe than any other east coast port of call, the first destination for carriers sailing from Asia through the Suez Canal, and with seamless intermodal connections to and from the heartland of North America, the Port of Halifax is Canada's Atlantic Gateway to the world.

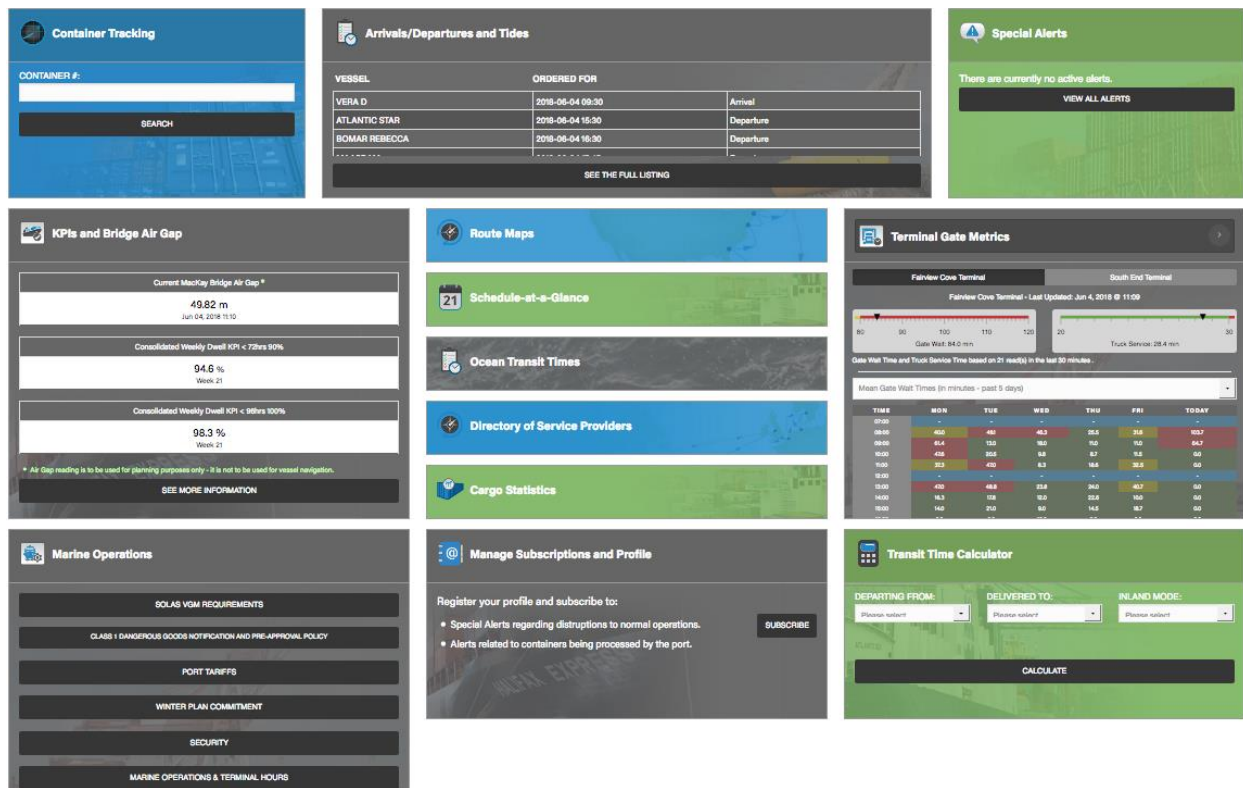
The Halifax Port Authority (HPA) is an agent of the Government of Canada created in 1999 pursuant to the Canada Marine Act. The mandate of the HPA includes: the administration of Halifax Harbour; the regulation of port operations; the management and development of port facilities; the provision of port services; and, the promotion of trade and related business development through the Port of Halifax.

## Introduction - Highlights

The Port of Halifax is a discretionary port which is surrounded by a relatively small local population in Atlantic Canada. Growth will be through inland markets such as Montreal, Toronto, Chicago and Detroit, that are accessed by rail.

Investments in technology, innovation, and data transparency are critical to improving the overall value proposition and to attracting and retaining market share. On June 5, 2017, the Halifax Port Authority re-launched its main web property, [www.portofhalifax.ca](http://www.portofhalifax.ca). The new site has a focus on our container cargo business and highlights the organization’s commitment to adding more value to its customers and partners. From a functional standpoint, the single greatest change was the introduction of the Port Operations Centre (POC).

The POC has become the HPA’s central tool for communicating with the port community. Its diverse functionality serve the needs of a far-reaching audience which includes: shipping lines, retailers and other BCO’s, terminal operators, truckers and truck dispatchers, government partners, vessel captains, pilots, tug operators, and the general public.



The POC is a collection of new tools and innovations, tools that previously were not publicly available, and tools that were incorporated from different sites which have since been retired.

The HPA publishes timely and current information on the POC and allows users to subscribe to customized Container Alerts and Special Alerts on situations which impact normal port operations, pushing them out by email or SMS.

The POC includes two tools which previously received AAPA IT Awards. The Bridge Air Gap (2016) and Container Tracking System (2007) were both leveraged for the POC. The Container Tracking System underwent substantial modifications in 2016 with the inclusion of truck gate activity tracking and the ability to subscribe to alerts.

### Goals & Objectives/Business Problem

As a discretionary port, the Halifax Port Authority understands that reliability is a major asset to attract and retain business through the Port of Halifax. The HPA also recognizes the value of providing current information, allowing the port community to make informed decisions in support of an effective port and an efficient and reliable supply chain.

The Port Operations Centre was created with the following vision:

To provide a single place where local and global members of the port community can find current operational and reporting information.

This vision has been realized through the development and presentation of a number of tools which provide valuable information to diverse audiences in the supply chain. The Port Operations Centre supports a global port community, providing current information so users can make operational decisions and track performance.

Through the ability to access data in a single place, and the ability to receive customized alerts, the HPA is providing information that enables interested parties to access operational information where and when they need it.

## Discussion

### Background:

The POC leverages data from HPA's supply chain partners and consolidates them in a single place. It is a mix of functionality from disparate systems that have been merged into one platform. Several tools and metrics were created for the POC. Others were previously not public facing or were brought in from HPA's previous HalifaxGetsItThere.com web site, which has subsequently been retired as a web property.

HPA worked with NATIONAL Public Relations to create the design, and with Nicom Maritime to develop the tools and implement the Port Operations Centre as designed. The tools available through the Port Operations Centre include:

### Current Information

1. Container Tracking – Using data provided via EDI from Port of Halifax terminals and rail provider, the container tracking system lets users know the status of their container by tracking nine separate import and export events within the terminals and the CN rail network:



The image shows a screenshot of a web application interface for container tracking. At the top, there is a blue header with a globe icon on the left and the text "Container Tracking" on the right. Below the header, there is a white input field with the label "CONTAINER #" above it. At the bottom of the input field area, there is a black button with the text "SEARCH" in white.

- Container Discharged
- Container Loaded to Rail
- Container Departed Terminal
- Container Arrived at Destination
- Container Out by Truck

- Container Loaded to Rail (Export)
- Container Arrived at Terminal
- Container in Gate
- Container Loaded to Vessel

The system was enhanced in 2016 to incorporate terminal truck gate activity and to allow users to subscribe to alerts pertaining to their container.

2. Vessel Arrivals & Departures –

The Atlantic Pilotage Authority (APA) dispatches marine pilots

| VESSEL        | ORDERED FOR      |           |
|---------------|------------------|-----------|
| ATLANTIC STAR | 2018-06-04 15:30 | Departure |
| BOMAR REBECCA | 2018-06-04 16:30 | Departure |
| MAASDAM       | 2018-06-04 17:45 | Departure |

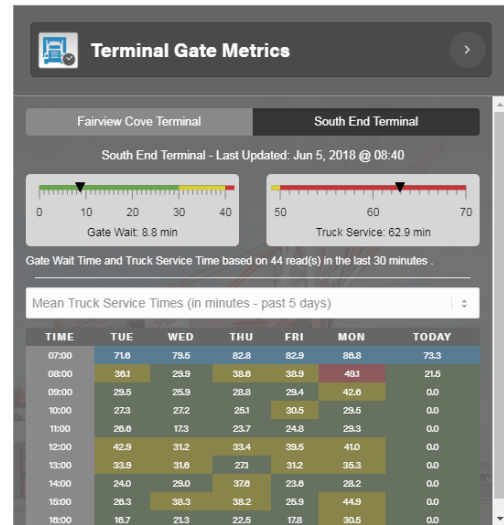
SEE THE FULL LISTING

for Atlantic Canada. HPA receives pilot assignments directly from the APA Pilot Dispatch System database and publishes them in real time to our POC.

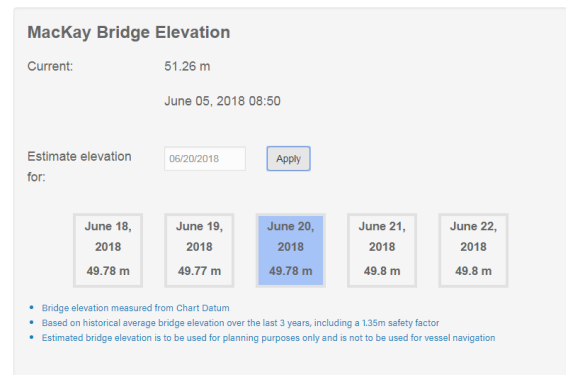
3. Special Alerts – Special Alerts are defined as events that represent a change to regular working hours, and may include delays from pilots, tugs, roadwork, weather, special announcements, holidays, changes to MARSEC level, or additional non-work periods. Users can view Special Alerts in the website and are able to subscribe to some or all alerts to receive them by email or SMS.

4. Terminal Gate Metrics – The Terminal Gate Metrics tool provides current information for two key metrics, by terminal:

- a. Gate Wait Times – Time spent queuing in the marshalling area prior to entering the inbound gate
- b. Truck Service Times – Time for trucks to be serviced and exit the outbound gate



5. Bridge Air Gap – The Bridge Air Gap tool provides both the current air gap (the current distance between the lowest point of the bridge structure within the navigational channel and the water below), and the current bridge



elevation relative to chart 0, for the lowest of Halifax’s two harbour bridges, the MacKay Bridge. Since integrating the Bridge Air Gap tool into the POC, HPA has added a predictive tool which allows users to forecast the air gap up to 12 months out.

6. Marine Operations Information – Operational information pertaining to the Port of Halifax, including:

- a. SOLAS VGM Requirements
- b. Class 1 Dangerous Goods Notification and Pre-Approval Policy
- c. Port Tariffs
- d. Winter Plan Commitment
- e. Security



- f. Marine Operations & Terminal Hours
  - g. Port Practices and Procedures Manual
7. Tides – Current Tides are published through a web service using tide table data maintained by the Canadian Hydrographic Service.

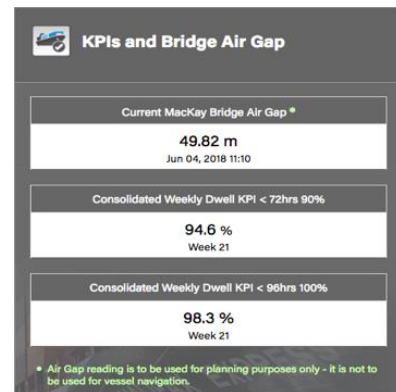
## Historic Information

8. Key Performance Indicators (KPIs) – The Port of Halifax

publishes two KPIs pertaining to consolidated dwell

times:

- a. 90% of containers departing within 72 hours of arrival on terminal
- b. 100% of containers departing within 96 hours of arrival on terminal



9. Terminal Gate Metrics – The Terminal Gate Metrics provide recent historic data based on the last five business days for Gate Wait Times and Truck Service Times, by terminal.

10. Cargo Statistics – HPA publishes quarterly cargo statistics and five-year cargo summary statistics.

## Global Connectivity Tools

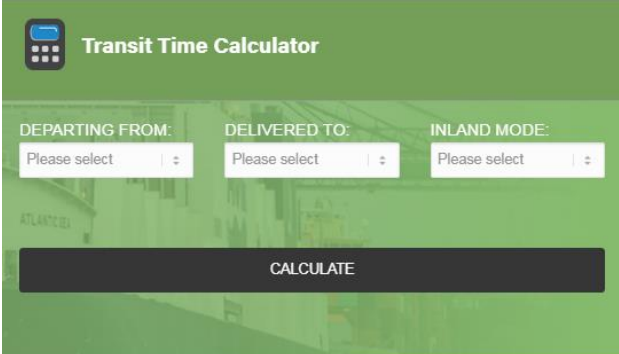
11. Route Maps – Route Maps provides current vessel route maps, showing the global connections through the Port of Halifax, searchable by port, by region, or by carrier

12. Schedule at a Glance – A summary of containerized ship line services calling at Halifax by world region.

13. Ocean Transit Times – Using data from BlueWater Reports, Ocean Transit Times allow a user to view times for direct-call (same vessel) global ports served by container services calling at Halifax. The tool also compares transit times for Halifax with Montreal, Vancouver and New York.

14. Directory of Service Providers – A detailed directory of the freight forwarders, trucking companies and warehouse operators at the Port of Halifax, with the ability to filter the list by various freight forwarding, trucking, and warehousing services.

15. Transit Time Calculator – Allows users to determine the import/export total transit time, including ocean transit, terminal dwell and inland transportation (truck or rail) and

The image shows a web interface for a "Transit Time Calculator". At the top, there is a green header with a calculator icon and the title "Transit Time Calculator". Below the header, there are three dropdown menus: "DEPARTING FROM:" with "Please select" and a dropdown arrow, "DELIVERED TO:" with "Please select" and a dropdown arrow, and "INLAND MODE:" with "Please select" and a dropdown arrow. Below these menus, there is a "CALCULATE" button. The background of the interface is a light green color with a faint image of a port terminal.

compare it with the ports of Montreal, Vancouver and New York. Results can be presented in tabular or graphic form, with links to the services and related route maps for service through Halifax.

Users can login to access enhanced functionality through the POC. Specifically, they can subscribe to Special Alerts, Container Alerts, Tides and Pilot Assignment notifications and Port Newsletters.

The HPA is continuously working to improve the quality and quantity of information available, and the POC will be further updated in July. The enhancements will include:

1. The addition of the Days on Dock metric
2. The addition of the Vessel On Time metric

3. Terminal Gate Metrics by week, month and year-to-date
4. Enhancements to the user experience

### Hardware/Software Used

Though it resides within a WordPress site, the POC web interface is customized and was built as a single page application using Angular and hosted within a WordPress website.

The POC was designed and developed using a responsive design approach producing a highly functional and visually pleasing user experience regardless of the user’s platform or device.

The website is hosted on a basic virtual private server running on a cloud-hosted Linux platform.

Microsoft’s .Net platform was leveraged to build both the backend service layer and the POC Admin Tools, a rich set of management tools used to maintain the configuration of each POC tool, special alerts and subscriptions.

The modules leverage a mix of technologies to provide information for the different components.

### Project Cost

The creation of the POC represented an investment of approximately \$165,000 CDN. Individual modules were launched separately between 2007 and 2018. The table below summarizes the total investment:

| Module                 | Approximate Cost (costs in Canadian dollars) |
|------------------------|--|
| Port Operations Centre | \$165,000                                    |
| Terminal Gate Metrics  | \$265,000                                    |

|                       |           |
|-----------------------|-----------|
| Bridge Air Gap        | \$200,000 |
| Global Shipping Tools | \$138,000 |
| Container Tracking    | \$92,000  |

**How the Project Fulfills the Award Criteria**

**Level and nature of the benefits**

As the HPA seeks to develop its digital advantage, the POC is viewed as an essential tool. The ability for shippers, vessel captains, truck dispatchers, pilots and others to find current and historical information provides a valuable service for the local and global port community.

Many of the tools have benefits that are tailored to the needs of specific users. For example:

- Terminal Gate Metrics provides useful information for truck dispatchers, truck drivers and end customers who regularly move containerized goods through the Port of Halifax.
- Route Maps provides available routing options for shippers.
- Bridge Air Gap provides a predictive tool for vessel planners.
- Vessel Arrivals and Departures provide information for truckers and consignees.
- Container Tracking provides information for consignees.

These tools contribute to the HPA’s business goal of improved operations and a better overall experience for port users and partners.

**Creativity of the solutions or programs**

The tools are built to support the vision and strategic direction of the HPA, and the execution of this required creative thinking. Of significant note is the fact that the POC leverages data

available from many other stakeholders and partners, through the use of automated EDI feeds and web services. For example, when it was recognized that marine pilots had the most current information for vessel arrivals, HPA arranged to publish vessel arrivals directly from their database. Similarly, current and predicted tide readings are derived from the Canadian Hydrographic Service, transit times from BlueWater reports, air gap from HPA's Air Gap Management System, vessel load / discharge and terminal gate activity from the terminal operators' TOS, and rail movement events from rail service provider CN. The Terminal Gate Metrics tool makes innovative use of an existing population of vehicle transponders already in use for tolling applications on the harbour bridges and the regional road network.

This highlights the benefit of consolidating operational and reporting data on a single platform.

The availability of customized Container Alerts and Special Alerts is another example of an innovation that allows the POC to provide useful data to people who visit the site infrequently for a sole purpose.

#### Whether the project or program results are apparent

In the first year that the Port Operations Centre was live it received 4,400 unique monthly visitors. The HPA currently has 726 active subscribers and has broadcast 45,000 alerts (tides and pilot assignments, container alerts and special alerts) by email or SMS.

The anecdotal feedback has been more telling, with people commending the availability and transparency of timely metrics and operational information, noting that the Port of Halifax is providing more information than many competitor ports. On multiple occasions HPA has been told that the POC played a part in diverting new or additional business to the Port of Halifax.

The Halifax Port Authority will continue to add functionality and make improvements in response to feedback and requests from its partners and customers. The Port of Halifax has experienced two years of solid growth, due in part to the high level of service provided by all members of the local supply chain, facilitated by the operational tools available on the POC, and measured and monitored by the KPI's tracked in the POC for all to see.

### Cost effectiveness of the activity or program

The total investment for the POC represents a significant undertaking for the Port with tools being built over many years. This is justified by the value proposition of providing timely and current information to users, wherever they may be, and the total investment demonstrates exceptional value.

### The transferability of the technology idea to the port industry

The tools and organization of current operational and reporting information that make the POC valuable can be applied to other ports.

### Conclusion

The POC is the Halifax Port Authority's means of ensuring a high degree of data transparency while providing useful information to the community. In the 12 months since it has been operational, the POC has seen constant evolution, with the addition of new tools and improvements in the quality and quantity of information. Once additional near-term enhancements are implemented, the HPA will look for new opportunities to integrate blockchain data and develop additional valuable metrics. The Halifax Port Authority is committed to ongoing development of the platform as it grows with industry needs.