

# **Jurisdictional Scan of Traffic Management during Incidents on Bridges**

**Discussion Paper**

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## **1.0 Purpose**

Unplanned closures of major bridges or corridors have significant costs to society by impacting traffic, emergency services, hospital services and the movement of goods. The purpose of this document is to present findings of a jurisdictional scan of traffic management during incidents, particularly suicide attempts on bridges. It is noted that suicide attempts are considered police incidents and response measures are deemed confidential information in some jurisdictions. This discussion paper summarizes the information gathered from various agencies in North America and parts of Europe.

## **2.0 Background**

The Ironworkers Memorial Bridge crosses the Burrard Inlet in Vancouver. It carries Trans Canada Highway (Highway 1) traffic and connects Vancouver to the north shore of Burrard Inlet, which includes the District of North Vancouver, the City of North Vancouver, and the District of West Vancouver.

The Ironworkers Memorial Bridge is a six-lane structure with three lanes in the northbound and three lanes in the southbound direction, separated by a centre concrete median barrier. On average, the bridge carries 120,000 vehicles daily. Traffic volumes in the peak summer months (June – August) reach nearly 124, 000 vehicles on average per day, thus making this an essential network link.

The Lions Gate Bridge crosses the first narrows of Burrard Inlet and connects the City of Vancouver to the North Shore municipalities of the District of North Vancouver, the City of North Vancouver, and District of West Vancouver. The bridge has three lanes, including a reversible centre lane, which carry 60,000 - 70,000 vehicles per day.

Both crossings are vital to the transportation network. Hence, any unplanned closure on either of the two bridges has significant impacts to Greater Vancouver communities, goods movers and travellers.

### **3.0 Existing Legislation in B.C.**

Suicide attempts on bridges are police incidents. The police have the authority to respond to the incident including directing traffic as they deem necessary. This authority is noted under Police Traffic Direction in Section 123 of the Motor Vehicle Act. It states:

*If a peace officer reasonably considers it necessary to*

*(a) ensure orderly movement of traffic,*

*(b) prevent injury or damage to persons or property, or*

*(c) permit proper action in an emergency,*

*the peace officer may direct traffic according to his or her discretion, despite anything in this Part, and everyone must obey his or her directions.*

### **4.0 Practice in Other Jurisdictions**

A number of bridge authorities and operators in Canada, the United States and Europe, including some agencies belonging to the International Bridge, Tunnel and Turnpike Association (IBTTA) were contacted with regards to their practice on traffic management during suicide attempts on bridges. A summary is provided below.

#### **4.1 Canadian Bridges**

##### **4.1.1 Halifax – Dartmouth Bridge Commission, Halifax, Nova Scotia**

The Halifax – Dartmouth Bridge Commission maintains and operates two suspension bridges, MacKay Bridge and MacDonald Bridge, across Halifax Harbour in Nova Scotia, Canada.

MacKay Bridge has a 4-lane cross section and carries on average 55,000 vehicles daily. Pedestrians and cyclists are not allowed on this bridge.

MacDonald Bridge has a 3-lane cross section with a centre reversible lane, similar to the Lion's Gate Bridge. On average, MacDonald Bridge carries 42,000 vehicles per day.

Pedestrians are allowed on one side of the bridge and cyclists on the other. The bridge sidewalks are 2.6 m wide on each side.

During a suicide incident on these crossings, the police assume incident command and have the authority to shut down the bridge completely. Typically, lane closures are partial and vary from 20 minutes to 1.5 hours.

#### **4.1.2 Blue Water Bridge Canada, Point Edward, Ontario**

The Blue Water Bridge is a pair of bridges that cross the St. Clair River, connecting the communities of Point Edward/Sarnia, Ontario in Canada to Port Huron, Michigan in the United States. Each bridge span provides 3 lanes of traffic capacity in each direction carrying an annual average daily traffic of 14,000 vehicles. Pedestrians and cyclists are allowed on the bridge sidewalk.

During a suicide incident, the police are in charge of the incident and have the authority to shut down the bridge completely. Closures are short and typically limited to a single lane for most incidents.

#### **4.1.3 Jacques – Cartier Bridge, Montreal, Quebec**

The Jacques Cartier Bridge crosses the Saint Lawrence River from Montreal Island, Montreal, Quebec to the south shore at Longueuil, Quebec, Canada. The five-lane bridge carries approximately 100,000 vehicles a day.

In the event of suicide attempts, the police are in command and may shut down the bridge completely.

## **4.2 US Bridges**

### **4.2.1 Golden Gate Bridge, San Francisco, California**

The Golden Gate Bridge has six vehicle lanes with lane reversible capabilities. It has sidewalks greater than 3 m wide on each side of the bridge to accommodate pedestrians and cyclists. The pedestrians are funnelled to one side of the bridge and the cyclists to the other side, except when bridge maintenance work is in progress, during which time both the pedestrians and the cyclists are directed to use only one side of the bridge. The bridge carries 113,000 vehicles a day on average.

The police are in command during suicide incidents. The Golden Gate Bridge has its own police force and also uses the California Highway Patrol to deal with bridge incidents. Typically, suicide incidents are managed on the sidewalk. Occasionally, one lane of traffic may be impacted for a short duration of approximately 15 to 20 minutes.

In dealing with incidents on the bridge, moving traffic is a priority and the bridge has never been shut down to deal with suicide attempts.

### **4.2.2 Tacoma Narrows Bridge, Tacoma, Washington**

The Tacoma Narrows Bridge is a pair of suspension bridges across Tacoma Narrows between Tacoma and the Kitsap Peninsula. The old bridge is dedicated to westbound traffic and the new bridge (Second Narrows) completed in 2007, is dedicated to eastbound traffic only. Each bridge carries four lanes of traffic. Before the completion of the Second Narrows Bridge, the original bridge carried two lanes of traffic in each direction. Pedestrians and cyclists are accommodated on the Second Narrows Bridge with a 3.6 m sidewalk. Each bridge carries 40,000 vehicles a day on average.

Incidents on the bridge are handled under a unified command structure with the state police taking a lead on suicide incidents. Typically, these incidents are managed from the sidewalk, thus rarely disrupting traffic. At times, one or two lanes of traffic are closed for a short duration. The average incident time is 10 minutes. It should be noted that

traffic incident management training is provided for all emergency responders including the Washington State Department of Transportation.

Washington State has a joint operation policy statement where all emergency responders work together to resolve an emergency situation with a 90 minute time target. All incidents that take over 90 minutes to clear are tracked for debriefing.

The Department of Transportation has the capability to use any one of the two bridges for bi-directional traffic in the event one of the bridges is required to be shutdown completely. However, traffic has never been completely shutdown on any of the two bridges during suicide attempts.

#### **4.2.3 Niagara Falls Bridge Commission, Niagara Falls, New York**

The Niagara Falls Bridge Commission is responsible for the administration and maintenance of the international bridges crossing the Niagara River. The commission is responsible for three bridges namely, the Rainbow Bridge, the Third Queenston-Lewiston Steel Arch Bridge, and the Peace Bridge connecting the province of Ontario, with New York State. On average, the combined bridges account for nearly 33,000 vehicle crossings a day.

Information gathered on suicide incidents is limited to the Rainbow Bridge because pedestrians are only allowed on this bridge. Rainbow Bridge has a four lane cross section and a wide sidewalk to accommodate pedestrians and cyclists. The bridge carries over 8000 vehicles a day on average.

During suicide incidents, the police are in command and have the authority to close the bridge completely. It was noted that the bridge has never been closed completely as a result of suicide incidents; however, one lane of traffic has been closed for a short duration to deal with such events.

**4.2.4 Tobin Memorial Bridge, Massachusetts Port Authority, East Boston, Massachusetts**

The Tobin Memorial Bridge connects the Charlestown section of Boston with Chelsea. The bridge provides three travel lanes northbound on its lower level and three lanes southbound on the upper level. The average annual daily traffic is 32,000 vehicles on the upper southbound level and 45,000 vehicles on the lower northbound level. Pedestrians are not allowed on this bridge.

The Port Authority has a contract with the State Police to patrol the bridges and as such they are always contacted first to respond to suicide incidents. The police are the incident commander and have the authority to shut down the bridge. However, the general practice has been to not close any traffic lanes. Typically, a tow truck equipped with an arrow board is parked at the incident location for a short period of time to move the traffic over to the adjacent lane. The average incident time ranges between 15 to 20 minutes.

**4.2.5 Delaware River Joint Toll Bridge Commission, Morrisville, Pennsylvania**

The Delaware River Joint Toll Bridge Commission maintains twenty bridge crossings between Pennsylvania and New Jersey.

The Commission has a contract with the State Police to deal with suicide incidents on bridges. The police have the authority to shut down the bridge; however, none of the bridges have been completely shut down in the past twelve years. It was noted that partial closures have been carried out which typically last less than 1 hour.

**4.2.6 Crescent City Connection, New Orleans, Louisiana**

The Crescent City Connection is a pair of bridges over the Mississippi River that connect the East Bank to the West Bank of the river. Each bridge configuration provides four general traffic lanes plus one Transit/High Occupancy Vehicle (HOV) lane. The annual

traffic volume exceeds over 172,000 vehicles per day at the crossing. Pedestrians are allowed on the 2.4 m wide sidewalks.

The Louisiana Department of Transportation indicated that when dealing with incidents on the bridge they do not require traffic flow to be maintained during an event such as a suicide attempt.

Such events are typically confined to the sidewalk; however a few incidents have resulted in closure of a traffic lane for a short duration.

#### **4.2.7 Brooklyn Bridge, New York, New York**

The Brooklyn Bridge connects the New York City boroughs of Manhattan and Brooklyn over the East River. The bridge is maintained by the New York City Department of Transportation. The bridge carries an annual average daily traffic of 145,000 vehicles over six lanes. Pedestrians and bicycles are allowed on the bridge.

In emergency events, each individual situation is evaluated, assessed and appropriate action is taken based on the specific circumstances. The intent is to keep the traffic moving in all emergency situations.

### **4.3 European Bridges**

Various agencies belonging to the European Association with Tolled Motorways, Bridges and Tunnels were also contacted. The agencies that responded to our queries are noted below.

#### **4.3.1 Midland Expressway Limited – Macquarie Motorway Group, United Kingdom**

Midland Expressway Limited (MEL) is responsible operation and maintenance of the M6 Toll in the United Kingdom.

The organization indicated that if a person was threatening to jump from a bridge then the police would close the road while specially trained officers tried to persuade the individual to return to a place of safety.

#### **4.3.2 Associazione Italiana Società Concessionarie Autostrade e Trafori, Italy**

Associazione Italiana Società Concessionarie Autostrade e Trafori (Italian toll motorways concessionaires) is an association responsible for the construction or operation of numerous highways in Italy. They indicated that all efforts are made to keep the road open during any emergency event.

#### **4.3.3 Lusoponte, Lisbon, Portugal**

Lusoponte is the Concessionaire in charge of the 25 de Abril Bridge and Vasco da Gama Bridge operation and maintenance. Both bridges are located in Lisbon, Portugal (<http://www.lusoponte.pt/uk/>).

For incidents on these structures, responders coordinate their efforts and resources to minimize traffic impacts during the event. Suicide is set as a Level 1 Emergency (the highest level) and police decide whether traffic lanes are to be open or closed.

## **5.0 Summary**

This discussion paper has presented a cross-section of traffic management practices in parts of Canada, the United States, and Europe during incidents on bridges.

A jurisdictional review of several Canadian provinces has shown that there is no legislated requirement to maintain traffic flow during suicide attempts on a bridge. In all cases, the police are the incident commander and have the authority to shut down the bridge. However, in practice, it was indicated that for most incidents, the closures have been partial, impacting mostly one lane of traffic. Also, closure durations tend to be short, ranging from 20 minutes to 1.5 hours.

Similar to Canada, for the United States jurisdictions contacted there is no legislated requirement to maintain traffic flow during emergency events on bridges. Information received from the various State road and bridge agencies indicates that some agencies have procedures to address incidents on bridges, although none specifically outline traffic management expectations. Some bridge authorities, such as the Golden Gate and the Tacoma Narrows, have their own police force to address bridge incidents. Washington State has a joint operations policy where all emergency responders including the Department of Transportation work together to safely clear traffic incidents within a target of 90 minutes.

In these jurisdictions, the police are the incident commander and have the authority to shutdown traffic completely. However, it was indicated that traffic lanes are typically not closed as most incidents are handled from the sidewalk. In some events, one lane of traffic may be required to be closed off. Closures typically last between 15 minutes and 1.5 hours.

The sample of European jurisdictions indicates similar approaches and practice.