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Problem

What	Problem(s)	Bridge closed for hours, expansion joint lifted by 2 feet
When	Date	January 10, 2016
	Time	Around 3 pm
	Different, unusual, unique	New bridge opened for traffic on 11/29/15, winter storm
Where	Facility, site	Nipigon, Ontario, Canada
	Unit, area, equipment	Nipigon River Bridge, designated as part of the Trans-Canada Highway
	Task being performed	Vehicle transportation

Impact to the Goals

Safety	Potential for injuries
Customer Service	Individuals stranded on wrong side of bridge
Regulatory	Ministry of Transportation inspection/investigation
Production/ Schedule	Significant impact to transportation/shipping
Property/ Equipment	Bridge damaged
Labor/ Time	Major investigation/repairs required

NIPIGON BRIDGE FAILS

Cause Map

Bridge closed after deck shifts up 2 feet

On the afternoon of January 10, 2016, the deck of the Nipigon River Bridge in Ontario unexpectedly shifted up about 2 feet, closing the bridge to all vehicle traffic for about a day. After an inspection by government officials and the addition of 100 large cement blocks to lower the bridge deck, one lane was reopened to traffic, with the exception of oversized trucks. Heavier trucks are required to detour around the bridge with the main alternative route requiring crossing into the United States. This failure is being investigated and it isn't known yet when it will be safe to open all lanes on the bridge.

"The ministry continues to work with the Ontario Professional Engineers who performed the design of the bridge at WSP (formerly McCormick Rankin Corp in Mississauga), and the Canadian firm that provided additional cable stayed bridge expertise, Buckland Taylor in British Columbia. The design was performed in accordance with the Canadian Highway Bridge Design Code and is capable of withstanding the necessary Code design parameters for winds in excess of 100 km/h and climatic conditions including freezing temperatures well below -40 degrees Celsius. The tensioning of the cables has been confirmed however, the ministry has not yet ruled out any factors in its investigation of the cause."

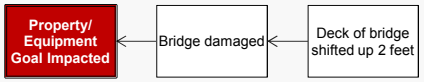
-The Honourable Steven Del Duca, Ontario's Minister of Transportation

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Analysis

Basic Level Cause Map - Start with simple Why questions.

Basic Cause-and-Effect



Investigators still don't have the whole answer to why the bridge failed. The Nipigon River Bridge is a cable stayed bridge and bolts holding the bridge cables failed, resulting in the deck of the bridge being pulled up at an expansion joint. Two independent testing facilities, National Research Council of Canada in Ottawa and Surface Science Western at Western University, are conducting tests to determine the cause of the bolt failures, but no information has been released at this time.

More Detailed Cause Map - Add detail as information becomes available.

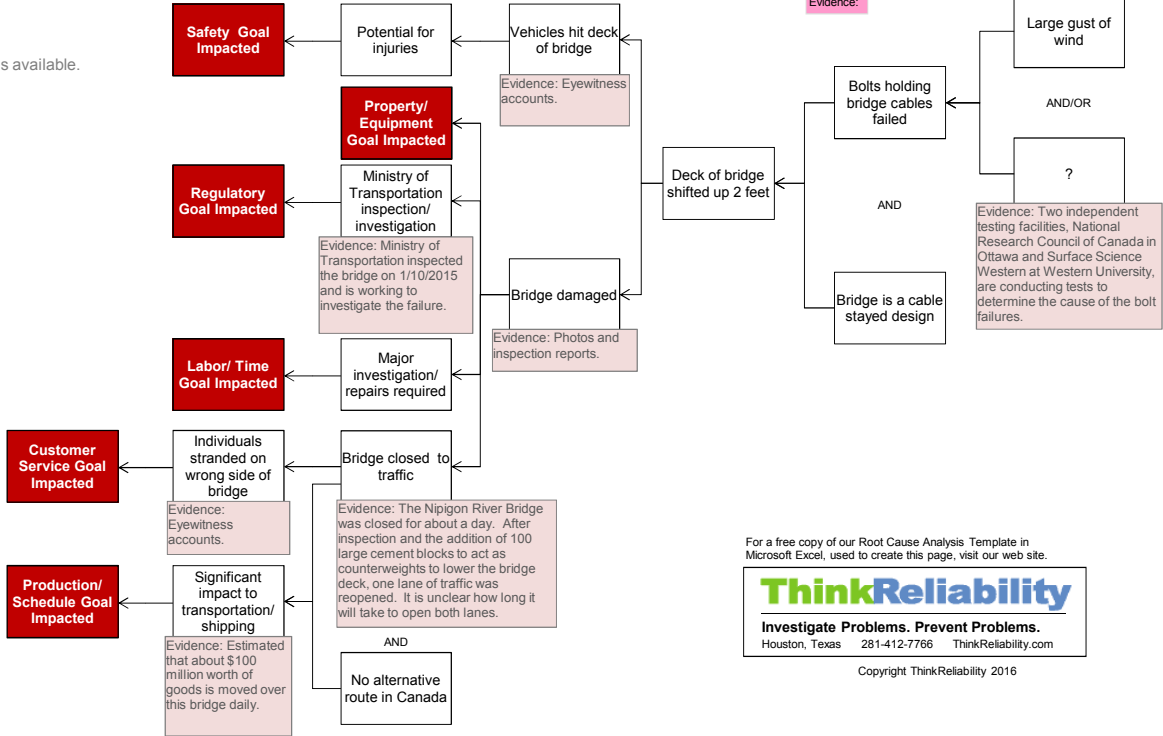
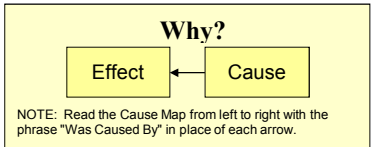
Cause Mapping is a Root Cause Analysis method that captures basic cause-and-effect relationships supported with evidence.

CAUSE MAPPING
 Problem Solving • Incident Investigation • Root Cause Analysis

Step 1 Problem - What's the Problem?

Step 2 Analysis - Why did it happen?

Step 3 Solutions - What will be done?



For a free copy of our Root Cause Analysis Template in Microsoft Excel, used to create this page, visit our web site.

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