SUPREME COURT OF NOVA SCOTIA
Citation: *Ketler v. Nova Scotia (Attorney General)*, 2015 NSSC 170

Date: 2015-06-10
Docket: Tru No. 340878
Registry: Truro

Between:

Mark Paul Ketler

Plaintiff

v.

The Attorney General of Nova Scotia, representing Her Majesty the Queen in right of the Province of Nova Scotia

Defendant

Judge:	The Honourable Justice Gregory M. Warner
Heard:	November 8 to 15, 2013, in Truro, Nova Scotia
Counsel:	**Nicolle A. Snow**, for the plaintiff **Duane Eddy**, for the defendant

By the Court:

[1] This case involves analysis of the duty of care owed by the Government for bridge maintenance on rural roads, and accident causation-in-fact.

Summary of Facts

[2] Mark Ketler was driving home on the gravel section of the North Salem Road, Hants County, Nova Scotia, about 4:15 p.m. on the sunny afternoon of October 21, 2010. As he approached an old ten-meter-long wooden bridge over a small creek (MacPhee Brook Bridge), he says that a deer darted into his path from the right and may have contacted the right front corner of his 1998 GMC Jimmy. He swerved to the right, drove off the right side of the bridge, rolled over and came to rest on the north bank of creek, about two meters below.

[3] Mr. Ketler received a painful injury to his right shoulder. It aggravated a pre-existing but asymptomatic arthritic condition. His injury persists to this time. He also suffered fractures to his sternum and back as well as headaches, from which he has fully recovered.

[4] Mr. Ketler is 48-years old. He was born in British Columbia and raised from the age of 13 in Calgary. He married his present wife, Tammy, ten years ago.

[5] He has a diploma in Information Technology and held related employment continuously thereafter in Calgary with government, a national accounting firm (KPMG), Nortel, and for five years until 2007 a national insurance company.

[6] In early 2007, he and Tammy visited and fell in love with Nova Scotia. The visit coincided with Mr. Ketler's desire to leave his high-stress IT occupation and to live at a more relaxed pace. The Ketlers purchased an older home on a four-acre lot on North Salem Road and moved in in September 2007.

[7] Mr. Ketler had no formal training but a natural aptitude for, and since the age of 13, vast experience in mechanics and machinery.

[8] In April 2008, Mr. Ketler began working seasonally at Penn Hills Golf Course. He was primarily responsible for maintaining and repairing the mechanical equipment, golf carts and buildings, as well as installing and servicing its computers. After the accident, Mr. Ketler was unable to return to work. He found a few odd part-time jobs and lived on "EI" until it ran out.

[9] Ms. Ketler was employed as a scheduler for the Jazz Airline at the Halifax Airport. The Ketlers were unable to live on Ms. Ketler's income alone.

[10] In 2011, Ms. Ketler decided to return to her hometown of Surrey, B.C. In June 2011, she started work as the gaming manager at the Great Canadian Casino. Her annual income went from $40,000 to a starting salary of $60,000 plus bonuses.

[11] Mr. Ketler decided to follow her to British Columbia. He reunited with her in February 2012. He found work with the City of Surrey Works Department, operating a street sweeper, at $17.00 per hour. He sees his future as a driver of the street sweeper. He cannot return to his prior occupation in Information Technology because, in his view, his skills have become outdated and would need significant upgrading.

[12] Mr. Ketler continues to have unpredictable, random pain in his right shoulder. The level of pain fluctuates, but it restricts his daily activities.

[13] He states that his relationship with his wife has deteriorated significantly. They are distant and do not talk except to argue. He is unable to pursue his hobbies of golfing, playing pool and fishing. He is unable to repair his own vehicles and machinery.

Part 1 - Evidence on Liability

[14] Each side presented three fact witnesses and one opinion witness.

[15] The parties also filed a short Agreed Statement of Facts, which included two facts relevant to the liability analysis:

1. Timber Bridge Barrier Standards were adopted by the Department of Transportation Infrastructure Renewal (DTIR), effective on May 25, 2007 (PR5076).

2. The MacPhee Brook Bridge was placed on a Timber Rail Replacement Priority List for an upgrade, which upgrade was scheduled for 2014.

Plaintiff's Evidence

Mark Ketler

[16] Mark Ketler remembers very little about the accident itself. He recalls nothing visually. He recalls hearing two crashes: once when he went over the bridge rail and a second time when his Jimmy struck the bank and rolled. Mr. Ketler described the nature of the North Salem Road and the use of surrounding lands. He identified the photographs of MacPhee Brook Bridge taken by his wife and of his damaged vehicle at a salvage yard.

[17] The emergency room records of the QEII hospital, where he was admitted on the evening of the accident, note that he reported that he was not wearing a seat belt. In his oral evidence, Mr. Ketler states that to the best of his knowledge he was wearing a seat belt. He knows this because he normally does as a matter of habit. He acknowledged having no specific recollection of using a seatbelt but says he stayed in the driver's seat throughout the accident.

[18] Immediately after the accident, he was in great pain. He was strapped to a board and taken by ambulance to the Truro hospital, where he was prodded and x-rayed, then shortly

thereafter transferred to the QEII hospital in Halifax. He was given pain medication and a CAT scan, before being discharged home on the same evening.

[19] On cross-examination, Mr. Ketler described the area from which he believed a deer appeared near the bridge as being covered at the time of the accident with tall foliage. The area did not look like the photographs shown to him at trial; they were taken in March 2009.

[20] There were no skid marks from his vehicle. He did not recall if he applied his brakes.

[21] Mr. Ketler was familiar with the road conditions of the North Salem Road, the bridge and the rails. He passed by it daily to go to and from his home.

[22] He did not think that he turned to the right as he entered onto the bridge, but may have veered to the right. He did not know where on the bridge he hit the wood rail. The rail was about 30-feet long.

[23] Mr. Ketler did not recall any burn marks on his body from the seatbelt. His left shoulder was not injured. He did not know what came into contact with his right shoulder. The air bag did not deploy.

[24] When asked if the North Salem Road had a low volume of traffic, he replied that it depended on the day and the time of the year. A motor sports park on Creighton Street (off North Salem Road) was used pretty regularly.

Tammy Ketler

[25] Tammy Ketler, the plaintiff's spouse, described the types of activities that took place on the North Salem Road. She said the race track was busy and noisy. There was a dog kennel next door and at least one dairy farm on the road.

[26] The road was paved to the North Salem cross-road and first bridge (MacPhee Brook Bridge is the second bridge on North Salem Road). Beyond the first bridge, the road was graveled and not in good shape. Potholes on the road were worse in the winter.

[27] She took a video of the east and west side of the bridge shortly after the accident. She says some of the wood was rotten and some of the posts on the rail were missing, making the rail wobbly. She identified her photographs and video.

Robert Smith

[28] Robert Smith is a neighbour and friend of Mark Ketler. He has lived on the North Salem Road for 40 years. The road is about 8-kilometres long. There had been eight farms on the road, but now there were only two farms. He said the motor sports park is used sparingly these days, unlike in the 1970s and 1980s. He described the condition of the road as like any gravel road – hard packed.

[29] On October 21st he drove home about the same time as Mark Ketler. Mr. Ketler called him on his cell phone and he immediately came to the bridge, less than one kilometre from his home. He was the first person at the accident scene.

[30] Mr. Ketler's vehicle was upside down in the brook and Mr. Ketler had crawled up on the road. Mr. Smith called 911.

[31] He returned the next day with Tammy Ketler and is the person shown in her video, shaking the rail on the west side of the MacPhee Brook Bridge.

[32] On cross-examination he acknowledged he was not aware of any accidents on that bridge before October 21, 2010. He saw no signs of a deer when he attended at the accident scene.

Dr. Frank Wilson

[33] Dr. Frank Wilson gave opinion evidence for the plaintiff.

[34] Dr. Wilson has impressive credentials. He is presently Honorary Research Professor, Transportation Group, Department of Civil Engineering at the University of New Brunswick. He graduated with a Masters in Civil Engineering in 1963 and a Ph.D. in Transportation and Environmental Planning in 1966. He has innumerable awards and is a long-standing member in various engineering academies and societies. He has conducted seminars and research on road safety. He was a safety auditor on several highway construction projects for over fifty years. He has participated in several professional and technical association committees respecting road safety. He has had over 100 articles published in professional journals. He has prepared over fifty reports for court proceedings. He has testified as a civil engineer respecting traffic engineering issues in courts in New Brunswick, Newfoundland and Prince Edward Island. Actions before Nova Scotia courts, for which he prepared expert reports, were all settled before trial.

[35] Dr. Wilson prepared an expert report, dated March 1, 2013. He was asked to examine the circumstances of the collision on October 21, 2010, between Mr. Ketler's vehicle and the timber bridge rail on the east side of MacPhee Brook Bridge. He also completed an assessment of the appropriateness and condition of the rail in the context of prevailing practices of the Nova Scotia Department of Transportation and Infrastructure Renewal ("DTIR"), including:

(1) the types of bridge rails general usually used on this type of bridge,

(2) whether or not DTIR had in place a system for setting priorities for the maintenance needs of the timber bridge rails on the MacPhee Brook Bridge, and

(3) prevailing practices within DTIR with respect to regular bridge inspections and their role in defining required maintenance and rehabilitation.

[36] His report is in five parts:

(1) a short introduction,

(2) a summary of the reference material he relied upon in setting out the standards for bridge construction and, in particular, bridge rails,

(3) a summary of the history of MacPhee Brook Bridge, including DTIR six inspection reports on the Bridge between October 2000 and October 4, 2010, together with his opinion on the factors described in the inspection reports that would contribute to the accident,

(4) a discussion of the function of bridge barrier and design guidelines, and

(5) eleven opinions or "findings".

[37] Dr. Wilson assumed as fact Mark Ketler's description of the accident: he drove north on the North Salem Road in his 1998 GMC Jimmy; a deer darted out into the highway as the Jimmy approached MacPhee Brook; the Jimmy swerved to the right, striking the guardrail on the east side of the bridge, plunged over the bridge and rolled over.

[38] He describes the approach to the bridge as straight and level with a posted speed limit of 80 kilometres per hour. The timber bridge was a short span structure with a deck length of 9.2 metres, a clear span from crib face to crib face of 7.5 metres, and deck width of 8.05 metres. The roadway was gravel and the timber bridge deck was covered with a sealed gravel surface.

[39] Dr. Wilson relied for his opinion, as to the appropriate standards for the design of bridges like the MacPhee Brook Bridge, upon several codes and two reports he prepared for analyses of collisions that occurred on two small timber bridges in Nova Scotia in 2002 and 2007. The primary source of standards relied upon by him was the 1997 "Highway Safety Design and Operations Guide" published by the American Association of State Highway Transportation Officials ("AASHTO"), the research for which was also the basis for guidelines prepared by the Transportation Association of Canada ("TAC") and the CSA Canada Standards in 2000 and 2006.

[40] Dr. Wilson wrote that MacPhee Brook Bridge is reported to have been rebuilt or extensively upgraded sometime in the late 1970s or early 1980s. He writes that during the period of the rebuild, governments were well aware of bridge design requirements and the importance of bridge guardrails. He states that this bridge had deteriorated significantly from the time it was rebuilt. Photographs tendered at trial show rotted wood on longitudinal rails and insufficient connections to the guard rail posts.

[41] He notes that a number of bridge inspection reports were completed by experienced bridge inspectors. They were either Level 1 or Level 2 inspections. Level 1 inspections were carried out by the area operations supervisor. Level 2 inspections were carried out by engineers who were full-time bridge inspectors.

[42] In an October 2000 Level 2 report, the inspector made note of the need to replace two posts and rated the barrier posts as fair. The recommended work was noted as urgent. The railing system was given a poor rating. The wearing surface of the bridge deck was noted to have potholes.

[43] A July 5, 2004, inspection report recommended some erosion control and stream realignment work, which he opined was not relevant to the accident in this proceeding. The report also recommended surface repairs.

[44] A bridge condition report of March 3, 2005, made several recommendations, two of which were relevant to the accident. The recommendations were for replacement of two bridge rail posts and the rail system within one year.

[45] A Level 1 inspection report of October 11, 2006 by the area operations supervisor, Carl MacPhee, rated the bridge structure as in poor condition. The rails were rated as in fair condition. Dr. Wilson notes that an entry by Carl MacPhee: "rails to replace, both sides" referred to a piece of rail on each side.

[46] The inspection report of March 27, 2009, carried out by Craig Parkin, a bridge inspector (a Level 2 inspection erroneously referred to as a Level 1 inspection by Dr. Wilson) rated the overall deck condition as fair. Some rot was noted on timber ends. The report noted that the east side curb was missing. The report noted that the railing was rotten and some pieces were missing with the approaches to the bridge containing many potholes.

[47] The bridge inspector's covering memo to the bridge engineer for the Central District outlined the deficiencies in the MacPhee Brook Bridge. It specifically noted that the current railing system was not up to DTIR standards. It recommended installation of a new railing system. Dr. Wilson opined that if a new railing system, recommended eighteen months before the accident, had been installed, the Ketler vehicle would not likely have careened off the bridge.

[48] Carl MacPhee, the area operations supervisor, conducted a Level 1 bridge inspection on October 4, 2010 (17 days before the accident). He rated the bridge as fair. He rated the rail system as poor and noted: "needs upgrade, one section rail replaced after inspect". Dr. Wilson opined that the report appeared superficial.

[49] Dr. Wilson wrote that, from his review of the discovery transcripts of DTIR officials Carl MacPhee and Guy Deveau, it was difficult to find any documentation of any action taken in response to the recommendations in the inspection reports.

[50] He opined that the factors related to the condition of the bridge that contributed to the accident were:

1. The condition of the deck surface (potholes) would make it difficult for a driver to regain control of his vehicle after swerving to avoid an object.

2. The "extremely deteriorated" condition of the bridge guardrail through which the plaintiff's vehicle careened, which had received poor ratings on inspection reports upon which no action had been. The "bridge barrier system in its condition at the time of the Ketler accident could not be expected to redirect an errant vehicle much less prevent a low speed (40 to 50 kph) vehicle from breaking through the railing system".

DTIR was aware of the condition of timber bridges on low-volume roads because fatalities that occurred in 2002 and 2007 on other timber bridges had led to a DTIR review of timber bridges. He found no evidence of action taken by DTIR.

3. The unprotected ends of the barrier railings created a danger. The ends could impale an errant vehicle.

[51] Dr. Wilson noted that the AASHTO, TAC and CAN/CSA standards and design guidelines provide that bridge barriers exist not simply to delineate the edge of the structure but also to reduce the probability that an errant vehicle would leave the bridge deck. He referred to specific sections in these standards to take issue with what he understood some defence witnesses said in discovery to the effect that the barriers existed simply to delineate the edge of the structure.

[52] In the report summary, he makes eleven "findings":

1. The bridge inspection reports were not made regularly and the deficiencies noted in those reports did not appear to have been acted upon.

2. The bridge deck surface and approach to the bridge had numerous potholes which would have a negative impact upon a driver controlling a vehicle on the bridge deck.

3. The guardrail system on this bridge was deteriorated to the point that it would not be capable of redirecting an errant vehicle away from the edge of the deck nor preventing the vehicle from careening off the bridge deck.

4. The curb was missing on the east side railing system. The absent curb could not redirect a vehicle away from the edge of the deck.

5. The unprotected ends of the bridge railings presented a safety hazard to those using the bridge.

6. Between 2002 and 2007, four fatalities had occurred on short timber bridges on low volume highways in Nova Scotia.

7. DTIR had recognized the problem and issued a press release announcing that a review of timber bridges was underway.

8. Notwithstanding their review and recognition of the problem, Dr. Wilson could not identify any actions taken on the recommendation from the bridge inspectors' reports on the MacPhee Brook Bridge.

9. Despite reports documenting the condition of the MacPhee Brook Bridge guardrails, no effort was made to implement temporary improvements, such as the use of Jersey barriers that were available within the district where the bridge was located.

10. If DTIR had followed their timber bridge barrier standards and maintained the barriers, the Ketler vehicle would have been redirected and would not have careened into the brook.

11. A bridge barrier is not simply to provide delineation of the bridge edge but is also to provide a level of safety to the traveling public using the bridge.

[53] In his direct testimony, Dr. Wilson acknowledged that this report did not constitute an accident reconstruction report. He had no data from which to prepare such a report.

[54] Dr. Wilson was directed to documents referred to in the defendant's expert report, prepared by Dr. John B. L. Robinson. A January 2011 British Columbia Ministry of Natural Resources Manual entitled "Development of Standard Curb Design Parameters" was one document referred to by Dr. Robinson. Dr. Wilson stated that the standard related to resource roads and was not applicable to public roads. He did agree with the reference in Dr. Robinson's report to the 2006 3rd Edition of "Roadside Design Guide", published by AASHTO. He referred the court to the first sentence in chapter 7, which highlights his conclusion that a bridge rail is a longitudinal barrier intended to prevent a vehicle from running off the edge of a bridge or culvert.

[55] Dr. Wilson was cross-examined. He acknowledged that he had not been to MacPhee Brook Bridge nor examined the wood on the bridge. He did not know how much the Ketler vehicle weighed or the condition of its tires.

[56] He was asked to define a "low-volume road" and whether such a road was defined in the AASHTO manual. He replied that a low-volume road was determined by a range of daily traffic. He acknowledged that in the AASHTO manual a low-volume road was identified by its average annual daily traffic ("AADT"). When he was directed to Dr. Robinson's report, he acknowledged that the upper threshold in the AASHTO manual for a low-volume road was 400 vehicles per day.

[57] He acknowledged a reference in Dr. Robinson's report to a 1997 survey of the North Salem Road as reporting an AADT of 170 vehicles per day, but he added that this survey was a sparse data base from which to determine that North Salem Road was a low-volume road. Thereafter he acknowledged that, based on the nature of land uses and rural population on the road, the North Salem Road is a "low-volume road".

[58] He acknowledged that the probability of an accident would be higher on a high-volume road and that this was a factor in selecting the type of guardrail when applying the AASHTO standard to a barrier system.

[59] He acknowledged that the MacPhee Brook Bridge timber guardrails met the standards for a bridge built in 1914 and possibly the standards when rebuilt in the late 1970s or early 1980s. However, because DTIR allowed the guardrail to deteriorate in the manner that it appeared to have deteriorated, the guardrail no longer met the design standards of the late 1970s and early 1980s.

[60] He relied upon AASHTO's published guidelines, adopted by various Canadian authorities. He acknowledged that AASHTO had no specific standard for a specific road.

[61] He acknowledged that the approach to MacPhee Brook Bridge was straight; the size of the bridge surface was very small (per the AASHTO manual); and, there was no record of a collision on that bridge before the one in this case. All of these were relevant considerations in determining the appropriate standard for a guardrail.

[62] Dr. Wilson acknowledged that in order to determine the probability that a vehicle would be deflected by a bridge barrier or guardrail, that one had to know, among other things: the speed of the vehicle, the angle of impact with the guardrail and the nature of the barrier. He acknowledged that he had no data respecting the angle of impact or what force that guardrail or any other guardrail would have to withstand to have deflected the Ketler vehicle. He had not conducted any tests on the structural integrity of the barrier system.

[63] He acknowledged that the deterioration by erosion at the footings of the bridge was not a causal factor relating to this accident.

[64] He was unable to identify any manuals, guidelines or codes from AASHTO or TAC that he had relied upon when describing the fact that unprotected barrier ends were substandard at the time this bridge was rebuilt in the late 1970s or early 1980s.

[65] Dr. Wilson was shown and acknowledged awareness of DTIR's Policies and Procedures Manual and, in particular, the operational procedure for the construction and repair of timber bridge barriers (Procedure Number: PR5076) effective May 25, 2007 (Ex 4, Tab 1.1).

[66] He acknowledged that it set a new standard for bridge barrier construction and maintenance for timber bridges in Nova Scotia. It appeared to be based on the same or similar performance standards as developed by AASHTO and TAC.

[67] The barrier selection criteria for timber bridges depended upon four factors:

a) the average annual daily traffic for determining whether the road was high or low volume,

b) the height of the deck above water and the depth of the water,

c) the curvature of the road, and

d) the grade of the road.

He acknowledged that the MacPhee Brook Bridge, when upgraded in the 1970s or 1980s, would have been assessed as a low-volume, straight road with a shallow brook a very short distance below the bridge deck.

[68] He acknowledged that in the late 1970s or early 1980s bridge barriers were not subject to full-scale crash testing.

[69] He acknowledged that to determine whether a particular vehicle would probably have been deflected by a bridge barrier would require an accident reconstruction investigation, taking into consideration the vehicle's speed, weight and angle of contact as well as driver input. He was unaware of whether the plaintiff in this case applied his brakes or not. No accident reconstruction investigation was carried out.

[70] Dr. Wilson acknowledged that, in the last stage of preparing his report, he became aware that the MacPhee Brook Bridge had been scheduled before the accident to be upgraded to the PR5076 standard at a date subsequent to the accident.

[71] He could not draw an engineering conclusion as to whether the plaintiff's vehicle would have been deflected by the barrier if the barrier had been upgraded before the accident to the PR5076 standard.

[72] Dr. Wilson emphasized that DTIR had ignored inspection reports expressing urgency respecting repairs to the bridge and rails then repeated that what he saw in the photographs produced no evidence of a curb on the east side of the bridge.

Defendant's Evidence

Craig Parkin

[73] Craig Parkin is a bridge inspector with DTIR. His formal training included a two-year diploma in engineering technology from NSCC Lawrencetown Campus; completion in the spring of 2005 in Minnesota of the National Highways Institute (NHI) course on basic bridge elements, construction and deficiencies; completion of a similar course for bridge inspectors conducted by Ontario's Ministry of Transportation; and, a two-week course conducted in about 2007 by Stantec Engineering.

[74] Mr. Parkin has been conducting bridge inspections with DTIR since February 2005. Since 2008, he has been part of the Central District Bridge Engineer's office at Bedford, under the direction of a bridge engineer and working with one other bridge inspector. The Central

District Bridge Engineer's office is responsible for between 650 to 700 bridges in Halifax Regional Municipality, Hants County and part of Colchester County.

[75] Besides inspections, his work includes briefing the supervisor of two five-person crews responsible for carrying out the restoration of bridges that are scheduled for upgrading in DTIR's long-term restoration plan.

[76] He testified that every bridge gets a Level 1 or 2 inspection annually in accordance with DTIR's Policies and Procedures Manual, PR5061: "Inspection of Structures".

[77] He described how this operations policy is carried out. He described how the inspection forms attached to the Policy are completed. Level 1 inspections are carried out by Operation Supervisors for depots within the Central District – for MacPhee Brook Bridge, by Carl MacPhee.

[78] Guy Deveau replaced John Freeman as the bridge engineer for the Central District in 2010.

[79] Mr. Parkin reviewed the reports attached to the appendices to PR1061 and the source of the rating systems used in each of the reports. Guidance was obtained from NHI Guidelines for rating the condition of rails.

[80] Mr. Parkin identified DTIR's Operational Procedure Policy PR5076 and the selection of the type of bridge barrier for timber bridges. He believed that the policy came into effect in 2007 or 2008, at which time DTIR started collecting the information to determine what type of barrier was needed for each bridge.

[81] In 2009 he carried out about 100 to 150 bridge inspections, one of which was on MacPhee Brook Bridge. He generated a memorandum, full report and photographs of the inspection on March 27, 2009. In his report, he noted five deficiencies and made three recommendations, one of which was installation of a new railing system.

[82] He identified NHI's Bridge Inspection Reference Manual used by him and his office as the guide for its work in 2010. The Manual was part of the material upon which his NHI training course had been based. He testified as to how DTIR tracked accidents related to bridges and testified that there was no history of an accident involving MacPhee Brook Bridge before October 21, 2010.

[83] He identified an exhibit showing one of the detailed accident data forms relied upon by DTIR for scheduling repairs and improvements to bridges. He identified the terms used to classify the types of highways and identified North Salem Road as a local road. Roads were classified for the purposes of identifying construction and barrier standards for both roads and bridges.

[84] He identified Jersey barriers as portable concrete pylons used to protect crews in the line of traffic on construction jobs and to replace damaged rails until they are replaced.

[85] He identified the Timber Rail Replacement Priority List for Hants County, created by Guy Deveau when he became the Central District Engineer in 2009.

[86] On cross-examination, he acknowledged that NHI was developed after a notorious 1967 bridge collapse in the United States. Since then, there had been an emphasis on bridge inspections as central to a safe highway system. He agreed with several statements in NHI's Bridge Inspectors Reference Manual, including that inspection reports should be specific, detailed, accurate, consistent and complete, because the information in those reports was used to determine and prioritize maintenance projects.

[87] He acknowledged that the Timber Bridge Barrier Operations Procedure: PR5076 was not a policy but rather mandatory procedure. It set a standard for replacement of timber bridge barriers, effective as of May 25, 2007. The new standard resulted from two fatalities that occurred when a car crashed through a wooden bridge rail.

[88] He acknowledged his training in recognizing rotting wood. He agreed that he was being as objective as possible in the preparation of his March 27, 2009, report respecting MacPhee Brook Bridge. He acknowledged noting rot at the end of timber rails and some missing pieces, resulting in him rating the rails as poor and recommending a new railing system. Replacement of the railing system was not in his control. He did not know what his engineer at that the time (John Freeman) did with his report.

[89] He based his report on his own inspection, without reviewing prior inspection reports. He acknowledged the provision in the NHI Manual respecting the benefits of reviewing prior inspection reports. He was asked to note the contents of inspection reports of 2000, 2004 and 2005. He acknowledged that in his report a handrail on the bridge was inadequate and had not been replaced.

[90] He acknowledged that if he felt Jersey barriers were needed for temporary safety on that bridge in 2009, they would have been available. His responsibility was to report to the engineer; it was the engineer's responsibility to decide whether to place Jersey barriers. Mr. Parkin did not recommend Jersey barriers.

[91] Mr. Parkin acknowledged his inspection report of June 10, 2011, produced as an exhibit without the photographs referred to in his report.

[92] He could not recall if the timber barrier had been replaced on the bridge at the time of this inspection. Some of the notes following this inspection report in the exhibit (Exhibit 3, Tab 3.11) were from his March 27, 2009, report. Similarly, some of the notes attached to the copy of his March 27, 2009 report in Exhibit 3, Tab 3.8 were actually from his 2004 inspection.

[93] Mr. Parkin was shown a video taken by Tammy Ketler on October 22, 2010, showing Robert Smith shaking the timber rail on the west side of MacPhee Brook Bridge. Mr. Parkin acknowledged that the rail was wobbly with a lot of give.

[94] He acknowledged that a Level 1 inspection should be carried every year, except those years when a Level 2 inspection is completed. A Level 2 inspection should be done every second year for bridges on collector or major roads; every four years for bridges on local roads. The exception is that a Level 2 inspection is carried out on those local road bridges every second year when the bridges are not in good condition.

[95] His 2011 Level 2 inspection was a follow-up to the 2009 report, where he had rated the MacPhee Brook Bridge as poor. The poor rating in 2009, he explained, related to the abutment and substructure of the bridge; the rail rating did not affect the rating of the bridge itself.

[96] Finally he identified the November 29, 2011 Expenditure Detail Report for Rail Replacement for the MacPhee Brook Bridge showing that it cost $19,265.82 to replace the rails.

Carl MacPhee

[97] From 2003 to 2012, Carl MacPhee was the Area Operations Supervisor with DTIR for East Hants, where MacPhee Brook Bridge is located. Generally, his responsibility was to maintain the road network in his area. He holds a Bachelor of Science degree, but no post-secondary or technical training in engineering. He has 23 years' experience in construction.

[98] His work force consisted of about 20 employees in the summer. It doubled in the winter. His crew's responsibilities included general maintenance of about 300 kilometres of highways, trunk roads, collector roads and local roads. His area included about 50 bridges.

[99] North Salem Road was a local road. Maintenance included the general condition of the road as well as bridges, guardrails, drainage and signage.

[100] Mr. MacPhee was qualified to conduct Level 1 bridge inspections. He attended training sessions for bridge inspections in 2002 and 2007.

[101] He did not coordinate his Level 1 bridge inspections with the Central District Bridge Engineer, but he did report any obvious deficiencies or damage to bridges to the District Bridge Engineer via copies of his Level 1 reports. He was authorized and did carry out minor repairs to bridges.

[102] His superior was an Area Manager, who in turn reported to a District Director (to whom the District Bridge Engineer also reported).

[103] Mr. MacPhee was familiar with Manual 23, which set out all DTIR's operating procedures. It included procedures for bridge repairs, and PR5076: "Timber Bridge Barriers".

[104] Any old bridge barrier, that required repairs to the extent of more than 50%, was required to be upgraded to meet the new standard that came into effect on May 25, 2007, the implementation date of PR5076. If the repairs required were less than 50%, they were required to be reinstated to the standard existing at the time that the barrier was installed.

[105] The pre-2007 standard for wood bridge barriers on low-volume roads required wood posts attached to the bridge and joined together by horizontal wood timbers. The wood was treated eastern hemlock - previously creosoted, and now pressure treated. The "new" 2007 standard for barriers consisted of flex steel rails attached to 8 x 8 inch wood posts, with the ends of the steel rails curved away from the road and buried in the ground.

[106] He carried out a Level 1 inspection on MacPhee Brook Bridge on October 4, 2010. His inspection report is the first page of Exhibit 3, Tab 3.10. It is on DTIR's form.

[107] While it was his duty to prioritize maintenance for roads in his area, this did not include prioritizing infrastructure like timber bridge barriers, other than in respect of minor repairs. Timber bridge barriers were the responsibility of the District Bridge Engineer. The primary objective of his bridge inspections was to assess needs, carry out minor maintenance then cause the District Bridge Engineer to become aware of any problems via his report.

[108] In completing his October 4, 2010, inspection report, Mr. MacPhee rated the components of the bridge based on his experience. His report noted that only one side of the bridge (the west side) was curbed. He did not believe it was a safety concern because rail systems constructed to the new standard do not require curbs.

[109] As a result of the Ketler accident, the first he was aware of on that bridge, the schedule for upgrading the bridge barriers was advanced from 2014 (the season scheduled on the Priority List of the Central District Bridge Engineer) to shortly after the accident. No curb was installed when the guardrails were upgraded, because the Timber Bridge Barrier classification under PR5076 was 'LVPL1', indicating a local road, with average annual daily traffic of less than 100 vehicles, on a straight road, with the bridge surface being less than 2.5 metres above water.

[110] In his October 4, 2010 report, Mr. MacPhee rates the rail system as poor and added: "Needs upgrade, one section rail replaced after inspection." The section of rail replaced was on the west side of the bridge. He saw no need to replace rails on the east side.

[111] Mr. MacPhee was shown photographs of the rail on the east side of the bridge, taken by Craig Parkin as part of his March 2009 inspection. It showed damaged railings. Mr. MacPhee stated that the east side railing did not look like that at the time of his October 4, 2010, report or he would have had that railing repaired.

[112] Mr. MacPhee attended MacPhee Brook Bridge the day after the Ketler accident and stated that he caused a new rail to be installed. The wood from the destroyed east side timber barrier was retained and stored at his depot after the accident.

[113] He identified the use made of Jersey barriers as protection of open excavations and temporary barriers when bridge railings were removed. No Jersey barriers were on the MacPhee Brook Bridge before October 21, 2010, because the rail was in place.

[114] On cross-examination, Mr. MacPhee acknowledged that he was not an engineer or technician and had used his judgment, not the 'guidelines for condition ratings' in the 1999 DTIR Bridge Inspection Manual, to rate the condition of the bridge. He was asked to compare the ratings in his Level 1 inspection report for MacPhee Brook Bridge to the ratings in the Manual and responded that his ratings would not have changed if he had used the Manual ratings guidelines. His overall rating of "fair" would have remained.

[115] Mr. MacPhee was shown Tammy Ketler's video of the wobbly rail on the west side of the bridge the day after the accident and was asked if it would have affected his rating. He replied that the rail still served its purpose of delineating the bridge. His overall "fair" rating would have remained because the essential elements of the bridge, the deck and the abutment were still good.

[116] Mr. MacPhee acknowledged that the Timber Bridge Barrier Operation Procedure PR 5076, was mandatory since May 25, 2007, and required timber rails to be replaced with the steel rails whenever the rails required upgrading. There are still several bridges in his area that needed to be upgraded to the new standard.

[117] He acknowledged his note in the October 4, 2010, inspection report that the rail system needed to be upgraded. He was aware that the Central District Bridge Engineer would review his report. He added that because the rail system for that bridge was already on the Priority List for an upgrade, it would not be upgraded earlier than the date set out in the Priority List, unless it was damaged to the extent of 50% or more. MacPhee Brook Bridge was put on the Priority List for an upgrade by the District Bridge Engineer in 2009.

Guy Deveau

[118] Since September 2009, Guy Deveau has been the DTIR District Bridge Engineer for the Central District. Since July 2013, he has also been DTIR's acting Area Manager.

[119] Mr. Deveau is a professional engineer with a civil engineering degree. He has worked with DTIR since graduating in 1992.

[120] The Central District Bridge Office is at Bedford. There are approximately 700 bridges in the Central District.

[121] As set out in DTIR's Policies and Procedures Manual 23, Operation Procedure PR5072 "Bridge Responsibilities, Construction and Maintenance", he is responsible for setting the district bridge priorities; ensuring that the annual district bridge inspection and maintenance programs are carried out with the inspections properly completed as well as ensuring that the repairs, restoration and construction are carried out according to plans for both capital and non-

capital maintenance, major and minor, based on available resources. Additionally, he is responsible for the training and supervising of bridge inspectors and bridge maintenance crews.

[122] For the most part, his inspection responsibilities are delegated to his two bridge inspectors.

[123] While various guides/methods were adopted for use by DTIR for bridge inspections over the years, in 2009-10, bridge inspectors used the American National Highway Institute (called NBI inspection method). Mr. Deveau identified and explained in some detail several reference documents and procedures related to and used for bridge inspections, maintenance and replacement in 2009-2010. Exhibit 4, Tab 2, is NHI's Bridge Inspector's Reference Manual; Section 11 and 13 describe the inspection method used by DTIR in 2009-10. Exhibit 3, Tab 10, sets out the NBI rating system used for Level 2 inspections. Exhibit 3, Tab 9, is the DTIR "Bridge Inspection Manual 1999". Exhibit 4, Tab 1, contains three operating procedures (PR 5076, PR5072, and PR 5061) from DTIR's Manual 23.

[124] Mr. Deveau's training in the conduct of bridge inspections included a two-week course by Stantec Engineering in June 2010 as well as several shorter courses.

[125] Mr. Deveau identified the purpose of PR5076 as consistency when determining the type of barrier to be installed on timber bridges. The level of protection required under the new 2007 standard was determined by examining the various criteria set out in the standard, including traffic volume, height above water, water depth, horizontal alignment (curvature) of the road, and road grade. The standard applied where truck traffic was not over ten percent and posted speed did not exceed eighty kilometres per hour.

[126] The lowest rating for a bridge, LVPL1, refers to the lowest performance level for low-volume roads. It applies to bridges with an annual daily average traffic (AADT) of under 100 vehicles and where the bridge deck is less than 2.5 metres above the water. The LVPL2 criteria for new construction or upgrading after May 25, 2007, applied to low-volume roads with less than 400 AADT and bridge decks less than 5 metres above the water. Diagrams attached to PR5076 set out the specifications for barriers for each matrix.

[127] Mr. Deveau identified the Timber Rail Replacement Priority List for the Hants County part of the Central District. The list was prepared by him from inspection reports as a special project in 2009 and completed in early 2010. The list identifies 80 bridges with timber rails in Hants County, of which 29 met the "new" May 25, 2007, standard. The remaining 51 bridges were prioritized and scheduled by Mr. Deveau for upgrading based on the criteria in PR5076. The 21 bridges rated PL1 (more than 3,000 AADT) were given top priority; the 18 LVPL2 bridges were given the second-highest priority and the 12 LVPL1 bridges were given the lowest priority.

[128] MacPhee Brook Bridge, rated LVPL2, and, in overall fair condition, was 28th on the Priority List to be upgraded to the new 2007 PR5076 standard. The estimated cost of the upgrade

was $17,680.00. It was projected on the Priority List to be upgraded in the 2014 construction season, based on the District's annual budget for upgrading.

[129] Mr. Deveau testified that the Timber Rail Replacement Program ("TRRP"), put in place in 2007, was intended to address the deficiencies in timber guardrails throughout Nova Scotia. DTIR looked first at recently constructed timber barriers to ensure they met with the May 25, 2007, standard; many did not. Under the program, timber rails that pre-dated May 25, 2007, were not required to be upgraded, but DTIR, pursuant to this replacement policy, determined to proactively plan the upgrading of these grandfathered timber rails that had been constructed before May 25, 2007. Operation Procedure PR5076 required retrofitting or upgrading of timber rails out of turn if 50% or more of the posts of an existing timber rail required replacement.

[130] Mr. Deveau reviewed Greg Parkin's March 27, 2009 inspection report for MacPhee Brook Bridge. He was aware of the several enumerated deficiencies. His action in response was to ensure the bridge's proper place on the Priority List for replacement of the timber rails.

[131] Mr. Deveau was asked to describe the duties of Carl MacPhee in respect of bridges in his area as the Operations Supervisor at Milford. It was his duty to ensure maintenance of roads and bridges, including repairs and replacement of timber bridges in his area.

[132] Bridges were inspected annually, in accordance with PR5061. Carl MacPhee's Level 1 inspection and reports would be reviewed by one of Mr. Deveau's engineers and, if urgent matters appeared, would be reviewed by him. As set out in PR5061, s. 3.3, the frequency of Level 2 inspections depended upon a series of factors, including the type of road and the NHI rating of the bridge.

[133] Mr. Deveau explained in detail the elements and criteria relevant to determination of priorities on the Timber Rail Replacement Priority List and how MacPhee Brook Bridge was placed on the list as 28th in priority for upgrading.

[134] The highest priority was given based upon the AADT of the road. A trunk road or a route, both of which had much higher traffic volumes than local roads, was given top priority. Other relevant criteria were applied to determine priority within the classes of low-volume roads. Mr. Deveau prioritized amongst bridges within the same classification based upon his review of the inspection reports and comments of the inspectors.

[135] The Timber Rail Replacement Priority List was not the only Priority List in the Central District. There was another for timber bridges in Halifax County and a master list for repair, construction and upgrades for all other elements of bridges (other than rails), including concrete rehabilitation and road surfaces.

[136] At any one time, 200 to 400 bridges required work in the Central District and funds were limited such that all needed repairs could not be carried out at once. The priority lists were used to plan and assign funds from the annual budget for the next year's construction season. Any urgent issues that arose within the year were dealt with immediately. If the cost of the upgrading

of timber rails for any particular bridge came in under budget, then the timber barriers for the next highest priority bridge would be carried out in that season's work schedule.

[137] Exhibit 3, Tab 6, is a spreadsheet used by Mr. Deveau that showed the Central District Bridge Maintenance Budget for the fiscal year commencing April 1, 2010, and ending March 31, 2011. It showed the projected cost, actual cost and amount above or below budget for work being carried out during that year on bridges under his various budgets, including the Timber Barrier Replacement Budget.

[138] Timber rail upgrades or replacements could come under two budgets: one was exclusively for replacement of timber rails, which budget in 2010 was $218,000.00 for the Central District; a second budget was for all types of repairs and replacement of elements of timber bridges, which budget for 2010 was $407,800.00. The total budget for all bridge work of all types in the Central District for that year was $1,310,100.00. His spreadsheet showed that on March 7, 2011, with 24 days remaining in the year, he had expended $1,220,402.00 or over 97% of the budget with $89,698.00 left to spend.

[139] Mr. Deveau then described the bridge management system (Exhibit 3, Tab 10). Its objective was the protection of the traveling public through six listed procedures. The program was used to track bridge inspections and helped to determine which bridges needed Level 2 inspections. This program was in place when Mr. Deveau became the Central District Bridge Engineer in September 2009.

[140] Mr. Deveau was asked to describe how the classification of the North Salem Road affected the maintenance of the MacPhee Brook Bridge. He noted that because it was a low-volume, local road, it had lower priority for maintenance than trunk roads and routes. When it was a matter of choosing maintenance on a bridge on a trunk road or route versus on a low-volume, local road, the bridge on the trunk road or route got higher priority because of the higher traffic volumes, the higher speeds of vehicles and the amount of truck traffic. Another consideration was that drivers on trunk roads or routes were usually less familiar with the conditions of the roads than those who used low-volume, local roads.

[141] Mr. Deveau stated that he was limited by a fixed budget for maintenance, upgrading and repair. Even if he had been given an unlimited budget, he did not have access to sufficient work forces, internally or externally, to carry out all needed work immediately.

[142] Mr. Deveau was not aware of any records with respect to the original construction of the MacPhee Brook Bridge. He understood it had been constructed in 1914; however, based on his examinations, it was obvious to him that the bridge had been reconstructed in the late 1970s or early 1980s.

[143] Mr. Deveau walked through the inspection reports and related photographs of the Level 2 inspections of 2000, 2004 and 2009. He had no direct knowledge of what repairs had been carried out as a result of these inspections. He confirmed that the timber guardrails on the MacPhee Brook Bridge were replaced to the May 25, 2007, standard (flex steel guardrails) in the

spring of 2011, ahead of the time scheduled for their upgrading on the Timber Rail Replacement Priority List. This was because, by Policy PR5076, it was required that the bridge be upgraded whenever the barrier was destroyed to the extent of 50% or more.

[144] The upgrade was carried to the new standard. The expense for this upgrade had not been forecast or budgeted for the 2010-11 fiscal year, but was carried out in that year and came out of Mr. Deveau's budget.

[145] Mr. Deveau explained that the reason that a guardrail meeting the new 2007 standard was not installed immediately after the October 21, 2010, accident was because he needed time to consider whether the bridge, as a whole, needed replacement. He instructed Carl MacPhee immediately after the accident to put up a temporary timber barrier. At the same time, another bridge situate on the paved portion of the North Salem Road (with a higher traffic volume) was being upgraded to the May 2007 standard as planned by the Priority List.

[146] When the guardrails were constructed on the MacPhee Brook Bridge in the late 1970s or early 1980s, they were not crash-tested guardrails. They were not intended to hold a vehicle back, but rather only to delineate the bridge. The handrail on the barrier was for the purpose of pedestrian protection.

[147] In contrast, guardrails constructed under PR5076, the design and construction of which he explained in detail, were crash tested and, depending upon the angle of impact as well as the size and speed of the vehicle, designed to deflect most vehicles that struck them. The PR5076 design was also intended, unlike any prior standard, to distribute the force of any impact along all of the guardrail posts.

[148] Mr. Deveau was unaware of any accident on the MacPhee Brook Bridge before October 21, 2010. If an accident had occurred, he would have been required to examine the reason for the accident. If the reason for the accident was due to the condition of the bridge, then it would get higher priority for upgrading.

[149] Mr. Deveau was cross-examined. He was aware of a fatal accident involving a vehicle leaving a bridge with a timber barrier in icy conditions, which led to the Timber Bridge Barriers Operating Procedure (PR5076) of May 25, 2007.

[150] He reviewed photographs respecting the use of spike and bolts on MacPhee Brook Bridge. His observation was that all of the posts were secured to the bridge by bolts and that rails, or some rails, appeared to be secured to the post by spikes. He agreed that if posts were secured to the bridge by spikes, there would be an issue or concern. This was not a concern with respect to the attachment of rails to posts.

[151] He reaffirmed his direct evidence that MacPhee Brook Bridge was required to be maintained to the standard of the time when it was constructed (PR5076, para 3). Only when it was replaced pursuant to PR5076 would it be required to meet the standard in PR5076.

[152] Spikes were not acceptable for use once the timber barriers were replaced in accordance with PR5076. He disagreed with counsel's suggestion that the use of spikes on timber rails was unsafe. He stated the primary purpose of the rail component in this situation was for delineation of the bridge and for pedestrian safety. The use of spikes provided a strong enough connection for their intended use. It was speculative to suggest that bolts would have provided more structural strength.

[153] Mr. Deveau was not aware of when the NBI rating system was instituted by the American NHI or when parts of it were adopted by DTIR. DTIR had used it and the Ontario (OSIM) standard to create its own standards. DTIR had sent inspectors for training under both the NBI and Ontario systems. DTIR looked at different agencies from which to find the better ways of carrying out their responsibilities.

[154] He agreed that one of the primary roles of bridge inspections was public safety and that barrier systems are intended to provide a degree of safety to the traveling public, but did not entirely agree that the purpose of barriers was to prevent vehicles from going off bridges. Barriers may be for the purpose of delineation or resistance. Barriers may be an aid to keep vehicles from going off the sides of bridges, but barriers were not intended to prevent vehicles that crashed into a barrier from crashing through.

[155] When asked to point to a document that set out that a bridge rail was for the purpose of the delineation, he repeated that not all railings were crash tested or intended to hold back vehicles, but rather existed for delineation of the bridge and the protection of pedestrians.

[156] When asked if timber bridges and timber barriers were still acceptable in Nova Scotia, he answered yes and pointed to PR5076. On LVLP1 bridges, it was acceptable for the barrier to consist of either a wheel guard or the flex steel guardrail. He referred to para 3 of PR5076 and Sheet 1 of Appendix A. Timber barriers were also acceptable where less than 50% of the existing bridge barrier required replacement. Reinstatement of the barrier was required to be to the standard which applied at the time of original construction.

[157] Wheel guards were acceptable where it was more probable that there would be no or very few pedestrians.

[158] Because there was only one AADT survey for North Salem Road, he was uncertain that the AADT for that road was under 100 vehicles per day; for that reason, Mr. Deveau rated MacPhee Brook Bridge as LVLP2.

[159] Mr. Deveau stated that the purpose of inspections was to report on the condition of the bridge so as to provide timely maintenance. Failure to take prompt action on recommendations did not "make the inspection system worthless."

[160] It was not the role of bridge inspectors to form or give engineering opinions or set timelines for the implementation of recommendations. They were not trained to do that. Their role was to report on the conditions of the bridges. It was the responsibility and role of the bridge

engineer to decide how to act on the conditions set out in inspection reports and the recommendations therein. Recommendations were carried out based on the Priority List and availability of monies to carry them out.

[161] Mr. Deveau and his four counterparts used their professional engineering judgment to determine how to act on inspection reports. Bridge engineers, not bridge inspectors, were responsible for carrying out PR5076.

[162] Mr. Deveau had not seen the 2000 Level 2 inspection report; it predated him. He was unaware of any inspection reports between 2000 and 2004. He was not aware of what action was taken in respect of the December 7, 2004, inspection report or how long records of expenditures were retained by DTIR. He believed that a bridge condition report dated March 3, 2005, was in respect of the December 7, 2004 inspection.

[163] It was his review of Craig Parkin's March 2009 inspection report that caused him to determine that MacPhee Brook Bridge should be upgraded to a new guardrail system and lead him to put it on the Timber Rail Replacement Priority List with the priority he assigned. He agreed that the March 2009 report, like the reports on 50 or 60 other timber bridges in Hants County and 70 or 80 timber bridges in Halifax County, showed a need for new rails. Mr. Deveau stated that his predecessor would not have acted on the recommendation in Mr. Parkin's 2009 report because he was still addressing deficiencies on timber guardrails on trunk roads and routes, which roads and routes had a higher priority for rail replacement. When Mr. Deveau arrived in September 2009, DTIR was still working on deficiencies on trunk roads and routes.

[164] With regards to the reporting of missing rails or parts of rails in the inspection reports, he would have sent a message to the District Operations Supervisor to reinstall the missing pieces as part of its day-to-day maintenance responsibility. In this case, Carl MacPhee had replaced pieces of timber with rotten ends on his own.

[165] Mr. Deveau was directed to Exhibit 3, Tab 8, a DTIR two-page document entitled "Bridge Inspection and Reporting Procedures". His approach to recording, reporting and acting on bridge inspections carried out its purpose, policy and objective.

[166] The fact that inspection reports showed a number of deficiencies, such as rot, was typical. That is why MacPhee Brook Bridge was placed on the Priority List. Its location on that list was a result of comparing its condition and the relevant factors with those of other timber bridges.

[167] He disagreed with the suggestion that the creation of the Priority List reflected a "cost effective" approach to timber rail replacement as opposed to a "probability of risk" approach. He stated the Priority List dealt primarily with risk, not cost.

[168] Mr. Deveau was asked to explain the color-coding on his Timber Rail Replacement Priority List. "Pink" indicated bridge slated for full replacement; timber rails on these bridges would not be upgraded if their turn in the Priority List arrived before they were to be fully

replaced. "Green" indicated that the timber rails on that bridge met the 2007 PR5076 specifications.

[169] Mr. Deveau agreed with the statement that the lower the risk to the public, the lower the bridge would be on the Priority List. When he created the Priority List, he evaluated the risk of an accident and the seriousness of an accident arising from the condition of the bridge barriers. In the case of MacPhee Brook Bridge, he assessed the risk of a serious accident as fairly low. He acknowledged that some risk is accepted as part of the prioritization; there was some risk in everything.

[170] It was impossible to design roads to prevent every accident. It was part of his consideration that drivers were expected to drive according to the conditions of the road. Drivers on low-volume, local roads would normally be more familiar with the conditions of that road than drivers on larger, busier roads. His responsibility was to look at ways to minimize the risk to the public. He disagreed with the suggestion that it was his job to ensure that all bridges were safe so that a car hitting the edge would be redirected.

[171] He repeated that he created the template for the Timber Rail Replacement Priority List with all of the relevant factors and criteria in mind. He had persons working for him attend each of the bridges; enter the raw data from inspection reports on templates he created, then he determined each bridge's position on the Priority List.

[172] Mr. Deveau did not recognize the spreadsheet (Exhibit 3, Tab 2), a record of the history of road accidents in Nova Scotia, nor know how or by whom the information was generated. Upon review of the entry of this accident in that exhibit, he suggested that the information probably came from a police report, copies of which he regularly received in his new acting manager's role.

[173] Mr. Deveau did not visit MacPhee Brook Bridge before placing it on the Timber Rail Replacement Priority List. He did review recent photographs of the bridge and inspection reports. He was not physically able to visit all 700 bridges in his district.

[174] He was familiar with Exhibit 3, Tab 6, which was the budget for bridge maintenance in the Central District. He believed that a separate section of the budget for timber guardrail replacement ("RIM") came into existence in 2007. For the fiscal year 2010/2011, the RIM portion of the bridge maintenance budget for the Central District was $218,000.00. In addition, he acknowledged, his office had separate funding from the total district funding for bridges of approximately 1.1 million dollars. The cost for the timber rail replacement on MacPhee Brook Bridge, totalling $19,265.00, came out of the RIM budget for that year.

[175] Mr. Deveau reviewed inspection reports and other raw data respecting deficiencies for the purpose of placing bridges on the Priority List. He reviewed data, photographs and reports to determine if any deficiencies were so alarming that they required immediate action. In each of those cases, he would visit the site of the bridge to determine the urgency of the repair.

[176] Mr. Deveau's prioritization for timber rail replacement was based on application of the rating criteria. He denied the suggestion that he could simply "move things around" on the list as he saw fit. He added that a deficiency did not necessarily mean a requirement for maintenance. Bridge barriers were not primary structural elements. He repeated that the reason replacement of the timber rails on the MacPhee Brook Bridge was advanced from 2014 (as projected on the Priority List) to 2011 was that, in accordance with PR5076, more than 50% of the rail had been destroyed.

[177] On redirect, Mr. Deveau stated that the creation of the Timber Rail Replacement Priority List was a policy to address the issues relating to the upgrading of timber bridge barriers.

Dr. John Robinson

[178] Dr. John Robinson gave opinion evidence for the defendant. Like Dr. Wilson, he has impressive credentials. He is a professional civil engineer (B. Eng., 1969; M. Eng., 1972; Ph. D., 1982). His formal education and 44-year work experience was in respect of traffic and transportation systems, specializing in providing independent advisory services to road agencies and authorities. He has carried out highway safety audits in seven provinces and in the United States. He was the chairperson of one of the first major road safety audits in Canada – the 1997 Ontario Highway 407 Safety Review Committee of Professional Engineers.

[179] He has gained both theoretical and practical knowledge respecting the issues and standards underlying highway design, engineer practices and road safety by reason of his roles as a former director of technology programs for what is now the Transportation Association of Canada (TAC) and on its behalf on an AASHTO research committee as well as a continuing member of many TAC committees.

[180] He played a role in the creation of TAC's geometric design guide and co-authored its chapter on roadside safety. For TAC he conducted numerous workshops on the TAC manual and related road safety issues. He is involved in current studies for a major revision of TAC's 1999 Manual.

[181] He has participated in numerous forensic investigations related to civil claims with respect to road design, operations and road safety in six provinces; he has testified as an expert witness four or five times.

[182] Dr. Robinson's opinion report is dated March 3, 2013. His report was not a rebuttal report to the report of Dr. Wilson. Both were filed at the same time. Absent a written rebuttal report, the court did not permit him to give oral rebuttal evidence respecting Dr. Wilson's report and trial evidence.

[183] His report examined the circumstances of the collision with the timber rail in place at the time of the accident on October 21, 2010, and assessed its condition and appropriateness in the context of DTIR's then prevailing procedures and practices, including:

1. the types of rails used on this type of bridge and their propriety to this bridge;

2. whether DTIR had in place a proper system for prioritizing timber bridge rail maintenance; and,

3. the prevailing DTIR practices for bridge inspections and their role in defining maintenance and rehabilitation needs for bridges and bridge rails.

[184] His detailed written analysis is summarized in 13 opinions, each of which was reviewed in his direct evidence:

1. The general physical character and condition of the North Salem Road on the day of the collision was in keeping with its local, low-volume road function in the provincial highway network.

2. The lack of any collision history associated with the MacPhee Brook Bridge suggested that this bridge functioned in an acceptable and benign manner from a road safety viewpoint prior to the Ketler crash.

3. Any analysis of barrier conditions on the MacPhee Brook Bridge crossing should be carried out in the context of the low-volume nature of the North Salem Road upon which it is located.

4. The original MacPhee Brook Bridge that existed on the day of the collision was constructed in 1914. To the best of his knowledge, no broadly accepted or applied timber bridge barrier guidelines, standards, policies, warrants, or other practices were in place at that time in Nova Scotia.

5. Road conditions and/or design factors did not place any role in causing the Ketler crash.

6. The primary cause of the crash was the sudden arrival of a deer on the roadway and its collision with Mr. Ketler's vehicle.

7. Mr. Ketler's vehicle left the bridge because of the failure of the timber bridge barrier on the right side of the structure to retain the vehicle upon impact.

8. The DTIR approach to timber bridge barrier selection and maintenance decisions since 2007, as described in their procedural number PR5076, is in keeping with current technical knowledge and practices, which ensures consistency when determining the type of bridge barrier to be installed on new timber bridges and the types of repair to be carried out on existing bridges.

9. The DTIR approach to timber bridge barrier selection and maintenance decisions, as described in procedure PR5076, appropriately recognizes and deals with the challenges posed

by very low-volume road bridge situations, such as that existing at the MacPhee Brook Bridge, as well as provides appropriate guidance and technical responses to those needs.

10. The DTIR bridge management system represents an essential and appropriate bridge management tool of the type widely deployed in North American road agencies for monitoring bridge inventories and conditions as well as providing consistent and defensible input to bridge maintenance, planning and prioritization decisions.

11. The Timber Rail Replacement Priority system developed and used by the Central District of DTIR, as reflected in Deveau's Priority List (Exhibit 3, Tab 5), represents an essential and appropriate tool for prioritizing and scheduling maintenance decisions on barrier systems for timber bridges. It uses inputs from DTIR's procedure PR5076 and condition data from the DTIR bridge management system to prioritize the maintenance and replacement process, which helps to ensure the consistency and defensibility of the final Priority List.

12. Maintenance on very low-volume roads or bridges often receives low priority in any resource prioritization scheme in the absence of a road safety incident or other manifestation of a critical risk. This appears to have been the case with the repairs to the MacPhee Brook Bridge, whose timber barrier was first identified as requiring maintenance in the year 2000. In any road or bridge prioritization system, where the emphasis must be placed on achieving the most cost-effective deployment of scarce public monies and the overall minimization of risk exposure to the travelling public, low-volume roads, with their attendant relatively low public risk exposure, often receive lower priorities. Because of the low-traffic volumes and the unique familiarity of the majority of users with the roads, the risks are generally regarded as manageable.

13. In reviewing the findings of his investigation, particularly in the light of the very low-volume nature of the North Salem Road and MacPhee Brook Bridge, it was his opinion that DTIR exercised a reasonable and appropriate standard of care in its maintenance of the condition of the MacPhee Brook Bridge. DTIR employed current guidelines and practices common to the field, appropriate procedures and resources, as well as technically sound prioritization and management systems.

[185] He expanded on his analysis and conclusions in his oral evidence.

[186] Respecting the first opinion, he added that low-volume roads constituted about 80% of the total mileage of roads but a very small percentage of traffic. Most drivers on low-volume roads live on those roads; who are familiar with the road and its hazards as well as the changes in the hazards. Therefore, they are better able to manage risks than users of higher-volume roads. It is almost impossible to justify economically the maintenance of low-volume roads; therefore, road agencies permit less stringent design and maintenance standards for low-volume roads. This broad policy is fundamental to all road agencies everywhere.

[187] His third opinion did not mean that DTIR did not have a duty to maintain and monitor the condition of the North Salem Road in a responsible manner.

[188] With respect to his fourth opinion, there were no guidelines in place for the design or construction of timber rails when MacPhee Brook Bridge was built.

[189] Dr. Robinson opined that procedure PR5076 was consistent with the practice throughout Canada and the United States for decision making respecting maintenance and replacement of timber rails. Because the design standards for replaced rails was not in place when MacPhee Brook Bridge was constructed, and the procedure in PR5076 regarding when those rails would be replaced was followed, the "new" design standards for rails in PR5076 had no impact upon the Ketler accident.

[190] Respecting his tenth and eleventh opinions, he clarified that he was referring to DTIR's bridge management system that existing at the time of the accident on October 21, 2010.

[191] The Timber Rail Replacement Priority List was an essential component of the management of DTIR's investment in bridges. The list incorporated all of the factors and conditions relevant to the assigning of the appropriate priority consistent with the assessment and management of risk to the traveling public.

[192] With respect to his fourth opinion, Dr. Robinson opined that, absent any history of accidents on a bridge, it is justified to place a lower priority on upgrades to timber rails on low-volume roads. This would achieve the objective of maximizing the safety benefit to the traveling public.

[193] Dr. Robinson noted that the October 2000 inspection report recorded the condition of the bridge but did not refer to any maintenance needs. The report reflects the natural, progressive deterioration of wooden timbers over time. He explained the use and importance of standardized terms in the inspection reports to ensure consistency in the rating system. Element 332 in that report rates the condition of the 28 metres of rails (both side of bridge). Of five possible ratings (1 – 5), 23.5 metres were shown as fully protected and functional; 4 metres were shown to be exposed to deterioration and 0.5 metres were under active attack but not yet damaged to the point where they were not functional. No part of the railing was rated 4 and 5, an indication of failure. This information was a necessary tool to DTIR in planning priorities for future maintenance.

[194] The criteria in PR5076 provided for three levels of barrier protection for roads based on traffic volumes. "LVPL" was a term adopted by Ontario's Transportation Department from the American AASHTO manual, and meant "low volume performance level". LVPL1 provided the lowest level of protection with some resistance at low speeds. LVPL2, the designation assigned to the MacPhee Brook Bridge, provided a higher level of resistance (protection) at higher speed and angles of attack. PL1, the rating for roads with an AADT of 400 to 3,000 vehicles per day, provided a much higher level of protection for more vehicles at higher speeds.

[195] Before the early 1980s, bridge rail design and timber barrier standards were based on the "static load approach" without any crash testing. When crash testing began in the early 1980s, most of these timber railings designed under the "static load" approach failed. In 1985, the American Transportation Authority required that future rail design take into consideration crash

testing. This lead to two studies: one for bridges and the other for roadside barriers, both of which developed a full range of approved barriers. Dr. Robinson stated that the design standards in PR5076 for low-volume roads came from these studies. The purpose of the new barriers was to reduce the probability that a vehicle would penetrate the barrier.

[196] Before 1985, the purpose of timber barriers was to delineate bridges and, where possible, to resist penetration. The AASHTO Manual points out that on low-volume roads, it is not appropriate to design barriers to resist penetration.

[197] Dr. Robinson has given opinion evidence, as an engineer, in court proceedings. He stated that for an engineer to reach a forensic conclusion, he would need to do a technical analysis. He visited MacPhee Brook Bridge twice; once in 2012 and again a few weeks before trial. He stated that the visits were important to understand the condition of the road and bridge, including the bridge's orientation, approaches and visibility as well as the manner in which the road may contribute to an accident.

[198] He testified that there are three possible contributing factors to a collision that form part of a technical analysis. Ninety-five percent involve some human error; thirty-five to forty percent involve roadway conditions; and, five to eight percent involve mechanical failure of the vehicle. More than one factor is often present in any collision. The site visit permits the technical investigator to confirm witness statements as well as to see what the driver saw and what action he or she took.

[199] Respecting his thirteenth opinion, Dr. Robinson concluded that DTIR exercised the reasonable and appropriate standard of care in the formulation and carrying out of its duty of care in respect of its bridge management system, including inspections and maintenance together with its program for upgrading of timber rails on low-volume roads.

[200] In a short cross-examination, Dr. Robinson acknowledged that he was not asked to give an opinion about the physical condition of MacPhee Brook Bridge at the time of the accident. Furthermore, at the time he attended at the bridge, the barriers in place were those constructed to the PR5076 LVPL2 standard.

[201] Dr. Robinson did not agree with counsel's suggestion that one of the functions of a barrier was to prevent vehicles from running off the side of a bridge. A barrier's purpose before 1985 did not include reducing the risk that a vehicle would penetrate the barrier. A barrier's purpose after 1985 was to resist penetration to some extent.

[202] Dr. Robinson was shown photographs showing potholes on the North Salem Road at MacPhee Brook Bridge. He did not mention them in his report because, in his view, and according to the plaintiff in his discovery evidence, the road condition had no influence on the accident. Whether it would have had an influence would depend upon a vehicle's speed as well as the nature, size and location of potholes.

[203] He disagreed with counsel's characterization of his direct evidence as stating that it was impossible to justify investment in low-volume roads. He said it was not impossible but rather difficult to give budget priority for maintenance on low-volume roads in competition with maintenance needs for roads that better serve the public interest in road safety.

[204] He acknowledged that the need for maintenance on the timber rails on MacPhee Brook Bridge was first identified in 2004, before operational procedure PR5076 was implemented. MacPhee Brook Bridge timber rails were not put on the Priority List for replacement until after the implementation of PR50765.

[205] Finally, while the only AADT survey in evidence was from 1997, he concluded that the usage of 170 average daily vehicles appeared to be unchanged from 1997.

Part 2 - Submissions

Plaintiff's submissions on liability

[206] In its pre-trial brief, the plaintiff submits that the defendant was aware from its own inspection reports carried out before the Ketler collision that the rail on the east side of the bridge was in poor condition and in need of maintenance. Despite the inspection reports, required maintenance was not undertaken before the accident. While the rail barrier appeared to be "whole", it was wobbly and contained rotten wood.

[207] The defendant owed motorists a duty of care. The plaintiff notes that the defendant does not dispute that it owed a duty of care.

[208] The standard of care was described in *Leddicote v Nova Scotia*, 2002 NSCA 47, (*Leddicote*) at para 31, as follows:

> The existence of a duty of care in circumstances such as these is determined by the two-step test enunciated in *Anns v. Martin London Borough Council* [1978] A.C. 728 (H.L.), reaffirmed by the Supreme Court of Canada in *Ryan v. Victoria (City)* (1999), 168 D.L.R. (4th) 513 and most recently applied in *Ingles v. Tutkaluk Construction Ltd.*, [2000] 1 S.C.R. 298. The principles from such cases were understood and correctly invoked by the trial judge. He framed three questions:
>
> 1. Did the province owe a duty of care to the plaintiff?
>
> 2. If so, what was the standard of care?
>
> 3. Did the province breach that standard?
>
> He found that the province owed a duty of care to Ms. Leddicote. In addressing the second question, Justice Tidman properly observed:

> The courts have made it clear that the province has a duty to take reasonable care in maintaining public highways to best ensure the safety of the driving public. The standard is not so rigid as to hold the province to be a virtual insurer against harm to the public using the highways.

[209] Justice Tidman's trial decision, affirmed on appeal, was to the effect that the province's duty was to take reasonable care in maintaining public highways to best ensure the safety of the driving public. This duty and standard is equally applicable to bridges. The plaintiff says that the standard of care is reasonableness, which is reflected in the defendant's operational directives and procedures. The plaintiff argues that the evidence proves that the province breached that standard of care.

[210] Despite the foreseeable risk of harm to the traveling public, identified in the inspection reports in 2004, 2005, March 2009 and October 4, 2010 (which reports recommended maintenance or replacement of the rail system), the defendant failed to maintain safe conditions by:

1. failing to immediately to act "to limit the use of or close a structure (the bridge) that was revealed by inspection to endanger public safety"; and,

2. failing to more effectively program maintenance, repair and rehabilitation work through early detection of structural deficiencies.

[211] The plaintiff notes that despite MacPhee Brook Bridge being scheduled for the replacement of its timber rails to the PR5076 standard in 2014, within one year of the accident it was fast tracked for upgrade. The plaintiff claims that despite Carl MacPhee's October 4, 2010, report, the only documented repair was his replacement of a single rail in an otherwise rotted rail system.

[212] The defendant's own directives on early detection and immediate action were ignored. In particular, the new timber rail standards (PR 5076) adopted on May 25, 2007, had not been applied to this bridge before the accident of October 21, 2010. This was despite a March 2009 inspection report recommending the replacement.

[213] Annual inspections were not carried out.

[214] Common sense, when applied to the obvious wobbly and rotten condition of the bridge rails, demanded remedial action.

[215] The plaintiff submits that even if a different standard of care applied to low-volume traffic roads, the defendant could not ignore clear safety risks or its own inspector's recommendations. He suggests that the existence of a sports track located off the North Salem Road brings into question whether North Salem Road was a low-volume traffic road.

[216] The plaintiff relies upon Dr. Wilson's opinion to the effect that the guardrail on the bridge had deteriorated to the point that it would not redirect an errant vehicle or prevent it from careening off the bridge. Despite the defendant being aware of the risks from previous fatalities on timber bridges, it had not made an effort to implement temporary improvements.

[217] Six years of documented deficiencies and unsafe conditions that place the public at risk did not meet the standard of care on the defendant.

[218] Plaintiff's oral submission at trial largely repeated its pretrial brief. Counsel pointed out the difference between a policy and an operational procedure in the determination of the standard of care on the defendant. He referred to Justice Cory in *Brown v British Columbia*, [1994] 1 SCR 420, (*Brown*) cited by the New Brunswick Queen's Bench in *Bubar v New Brunswick*, [1995] NBJ 389, (*Bubar*) at paras 13 and 14, for the analysis of what constituted a policy decision versus an operational decision or process in respect of reasonable maintenance of a highway.

[219] True policy decisions are usually dictated by financial, economic, social and political factors. Operational procedures are concerned with the practical implementation of policies. The latter are made on the basis of expertise, technical standards and standards of reasonableness. PR5076, 5072 and 5061, in the defendant's Manual 23, are operational procedures.

[220] The plaintiff referred the court to *Balan v Newfoundland*, [1994] NJ 426 (NfldSC), (*Balan*) for the proposition that while true policy decisions do not attract a duty of care, as described by Justice Cory in *Just v British Columbia*, [1989] 2 SCR 1228, (*Just*) decisions and actions involving the design and construction of a highway are operational in nature and must be subject to a duty to act with reasonable care (para 68). Decisions and actions involving implementation of a guardrail policy are operational in nature (para 82) and, based on Dr. Wilson's evidence in that case (*Balan*), the guardrail was found not to have been installed in accordance with good engineering practice (para 109).

[221] The determination of whether the existing bridge barrier at MacPhee Brook Bridge required the replacement of 50% or more of the posts, per PR5076, was an operational decision, for which decision the defendant owed the plaintiff a duty of care. Counsel submits that the defendant breached its duty and standard of care in two ways.

[222] First, in May 2007, when Operational Procedure PR5076 came into effect, it created a duty to replace existing timber barriers when 50% or more of the posts required replacement. Second, the defendant's inspection report revealed that 50% or more of the posts were needed to be replaced (the plaintiff says 100% were needed to be replaced) and these reports were ignored. Counsel expanded on both bases of liability.

[223] On the first basis, concerns about the timber bridge barrier system lead to PR5076, a new standard in keeping with the then-current technology, knowledge and practices. The standards were not applied to MacPhee Brook Bridge, even though three years had passed. The barrier inadequacy identified in the 2004 inspection report should have led to the replacement of the timber barrier as soon as the new standard was put in place in 2007. Instead there were no repairs

before the March 2009 inspection, in which report Mr. Parkin recommended installation of a new rail system.

[224] The plaintiff submits that Mr. Deveau erred in not giving MacPhee Brook Bridge a higher priority for replacement. He argues that Deveau's evidence of his risk assessment and the factors by which a lower probability of risk to the public lead to a lower priority does not stand scrutiny.

[225] When the defendant accepts a risk, no matter how low the probability, it must accept responsibility for the risk.

[226] Because of rot, the rail could not have prevented a vehicle from going over the east side of the bridge. The defendant had to accept the consequences of the risk. It could have brought the bridge up to the new 2007 standard or placed available temporary "Jersey" barriers in place.

[227] Despite its on-going duty to maintain the bridge, the defendant appeared to have ignored maintenance requirements identified in the inspection reports. Putting the bridge on the Priority List for upgrading the rail to the PR5076 standard was not sufficient. Failure to act within a reasonable time breached the standard of care.

[228] Expanding on the second basis of liability, counsel submits that even if the defendant was not required to replace the timber rail to the PR5076 standard until money was available, it was negligent in not maintaining the timber rail until it could be replaced. Liability arises from the deteriorated condition reported by various inspectors, whose reports with photographs are in evidence. This basis of liability includes the fact that the evidence shows that the curb on the east of the bridge was missing and had not been replaced.

[229] The court was directed to the defendant's 'Bridge Inspection and Reporting Procedures' policy (Ex 3, Tab 8), in which the inspection program was identified as including the following objectives:

1. to provide immediate action to limit the use of or to close any structure which is revealed by inspection to endanger public safety; and,

4. to enable bridge maintenance, repair and rehabilitation to be programmed more effectively through early detection of structural deficiencies.

[230] These objectives were not followed in the case at bar.

[231] Mr. Deveau said it was he who decided on the implementation of bridge recommendations, but he was unable to identify any document to affirm that the decision was his. Counsel directed the court's attention to PR5061, ss. 1.3 and 1.4, which stated that the District Engineer was responsible for maintaining the database and advising the Director or Area Manager involved of any safety concerns. Counsel submits that Mr. Deveau's statement that he

was the one to decide on priorities was contrary to the defendant's own manual in this regard and to the National Highway Institute December 2006 Manual (Ex 3, Tab 2.7).

[232] The plaintiff asked the court to accept Dr. Wilson's opinion that the rail was so deteriorated that it was unable to redirect a vehicle. The defendant produced no opinion evidence respecting the condition of the bridge and its own inspection reports provided lots of evidence respecting the condition of the rail.

[233] The plaintiff argued that Mr. Deveau's evidence that the rail was only for the purpose of the delineation of that edge of the bridge was contrary to its own policy, the NHI reference manual and public safety. Mr. Deveau was unable to point to a document that said the rail on the bridge on a low-volume road was only for the purpose of delineation. Dr. Robinson stated that a function of a rail was to redirect to some extent. There was no need for inspectors to report rot if the rails only purpose was to delineate the edge of the bridge.

[234] While Mr. Deveau stated that the defendant was only obligated to maintain the rail to the standard of the day, he did not even know what standard existed on the date of construction (approximately 1914) or at the time of the last major refit (in the late 1970s or early 1980s). There were no documents before the court of the standards in existence at either time. Dr. Robinson found nothing respecting the standard that existed before 2007.

[235] The plaintiff submits that Mr. Deveau did not give clear answers to questions and he referred to standards without any documentary support. The effect of acceptance of this evidence would be that, by failing to update an old bridge to the 2007 standard in PR5076, a lower standard of care applied. This defies common sense. Even if the standard of care was not the standard in PR5076, the east rail on the MacPhee Brook Bridge was not up to any standard of any day at the time of the accident.

Defendant's submissions on liability

[236] In its pre-trial brief, the defendant submits that it was not negligent in the maintenance of the bridge's rail system.

[237] Furthermore, the plaintiff's injuries were not caused by the condition of the bridge rail. The cause of the accident was the sudden arrival of a deer and its collision with the plaintiff's vehicle on a straight, dry, gravel roadway. The plaintiff lost control of his vehicle, then veered to the right through the rail, landing onto the north bank of the brook a few feet below.

[238] The defendant is responsible for the repair, maintenance and inspection of the bridge. Guy Deveau, an engineer and the Central District Bridge Engineer, supervised the inspection of bridges, including timber bridges in the Central District. The direction for bridge inspections comes from the 1999 Bridge Inspection Manual (Ex. 3, Tab 9) and Manual 23 (PR5061).

[239] MacPhee Brook Bridge appears to have been constructed around 1914 and rebuilt (or substantially rebuilt) in the 1970s or early 1980s. The bridge was built in accordance with the

standards existing at the time of its construction. There is no evidence before the court with respect to the standards that existed at the time of its reconstruction in the 1970s or early 1980s.

[240] Absent a safety incident, and the presence of an imminent risk to motorists, maintenance on low-volume roads and bridges receives lower priority than on higher-volume, higher-risk highways.

[241] PR5076, in the defendant's Manual 23, is in keeping with the current technology and practices to ensure consistency when determining the types of barriers for new timber bridges as well as repairs for existing bridges.

[242] Regular inspections were carried out on MacPhee Brook Bridge.

[243] After a fatal accident on a timber bridge in Guysborough County in 2007, the defendant implemented, via PR5076, a new standard for timber rails together with a program for prioritizing the replacement of existing timber rails. PR5076 is the tool by which the defendant prioritized and scheduled maintenance decisions for timber bridge rail systems.

[244] Craig Parkin's Level 2 March 27, 2009, inspection report noted five deficiencies respecting MacPhee Brook Bridge and gave the bridge an overall NBI rating of 4, meaning it was in poor condition. He noted that the timber rails were rotten at all ends with a few pieces missing. As a result of his report, the bridge was put on the Timber Rail Replacement Priority List and was slated for upgrade to the new PR5076 standard in 2014. The process for prioritizing and the factors considered by Mr. Deveau in placing MacPhee Brook Bridge on the list for rail upgrading was appropriate, not careless or negligent.

[245] On October 4, 2010, Carl MacPhee's Level 1 inspection report rated the bridge overall as "F" for fair and noted that the rail system "needs upgrade, one section rail replaced after inspection". MacPhee was satisfied that his repair made the bridge compliant with the pre-2007 standard.

[246] The new PR5076 standard for timber bridge rails, which provided for a combination of timber posts and metal rails, would provide a greater degree of probability of deflecting a vehicle back onto a bridge. These rails were not designed or guaranteed to do either. The primary objective of the rail or barrier under the old standard was to delineate the bridge, to provide some safety for pedestrians and to provide for some measure of resistance when struck by some vehicles.

[247] The rail on MacPhee Brook Bridge was upgraded to the PR5076 standard shortly after the 2010 Ketler accident, before it was scheduled for upgrading on the Priority List. This was because the rail was completely destroyed in the accident.

[248] The bridge inspection and reporting procedure (Ex. 3, Tab 8), which is part of the bridge management system, outlined five ways that the inspection program would obtain the objective of protecting the travelling public. It was these procedures that resulted in the PR5076 standard

for new timber bridge rails and for a method of upgrading existing bridges. The new standard provided greater protection, but neither the old nor new standard guaranteed that a vehicle would be deflected or stopped upon impact.

[249] There is no evidence before the court that, if the barrier on the MacPhee Brook Bridge had been constructed to the new PR5076 standard before October 21, 2010, it would have deflected or stopped the Ketler vehicle. Such a finding would require an accident reconstruction analysis that was not carried out in respect of this accident. The onus of proving liability and negligence by the defendant rests on the plaintiff. The plaintiff has produced no evidence that a failure to upgrade the rail system to the new standard would have prevented the accident or lessened the plaintiff's injuries.

[250] With respect to the duty of care, the defendant states that it is not an insurer but acknowledges, as stated by Tidman, J. at para 28 of *Leddicote supra*, it had a duty to take reasonable care in maintaining public highways to best ensure the safety of the driving public.

[251] The defendant refers the court to *Swinamer v Nova Scotia*, [1994] 1 SCR 445, (*Swinamer*) at para 23, where the court found that it would be a readily foreseeable risk that harm might befall highway users if it were not reasonably maintained.

[252] With respect to the standard of care, the defendant cites four decisions that, it says, should guide this court in determining its duty to the plaintiff: *Ryan v Victoria*, [1999] 1 SCR 201, (*Ryan*) at para 38; *Just supra*, at para 23; *Anderson v British Columbia*, 2008 BCSC 41, (*Anderson*) at para 43; and, *Hanscher v Saskatoon*, 1998 S.J. No. 116 (PC), (*Hanscher*).

[253] Counsel submits that keeping a highway reasonably safe does not extend to a requirement to retrofit. The term "repair" does not encompass a requirement to redesign and reconstruct a highway to a higher standard or to upgrade to a higher standard than that to which it had been previously designed and constructed. However, repair does require it to restore the highway to its previously designed and constructed state. It cites *Fry v Henry and Alberta*, [1985] A.J. No. 954 (CA), (*Fry*), at para 4.

[254] In this case, Carl MacPhee's evidence was that he reinstated the rail to the standard applicable at the time of the original construction in accordance with PR5076. The defendant submits that the placement of MacPhee Brook Bridge on the Timber Rail Replacement Priority List in the summer of 2010, with replacement scheduled for 2014, was reasonable as well as in accordance with the defendant's policy of public safety.

[255] The replacement program (PR5076) was designed to retrofit timber bridge rails to the higher PR5076 standard. The timing of the upgrading of the MacPhee Brook Bridge, and its placement on the Priority List, was based on objective, relevant factors explained at trial by Mr. Deveau. The list, as well as where MacPhee Brook Bridge was placed on that list for upgrading, was not negligent.

[256] Counsel suggests that the plaintiff argued that the fact that the replacement of bridge rails was moved up the list after the accident, shows that it could and should have been upgraded earlier. The defendant argues that, in accordance with the policy, the bridge was moved up because it had been totally destroyed in the accident.

[257] Despite being a straight, low-volume road with no accident history, MacPhee Brook Bridge was closely monitored and repaired when necessary, commensurate with the low risk that motorist would likely face.

[258] The defendant repeated that the plaintiff bore the burden of proving that a timber rail constructed in the 1970s or 1980s, in a better or perfect condition, would have prevented Ketler's two-tonne Jimmy from going through the rail, thereby reducing his injuries. Absent an accident reconstruction analysis, there is no evidence upon which the court can make that factual finding.

[259] A pre-2007 timber barrier was not intended to guarantee that a vehicle could stop or be deflected. While the type of rail designated for low-volume roads and for new bridges after PR5076 was of a higher standard, it too did not guarantee deflection even if there had been a duty on the defendant to retrofit pre-2007 timber bridge rails immediately in 2007.

[260] The defendant submits that the plaintiff's injuries were caused by the sudden appearance of the deer and his reaction, a non-tortious event. The defendant should not be liable for injuries not proven to be caused by its negligence. Counsel cites: *Athey v Leonardi*, [1996] 3 SCR 458, (*Athey*).

[261] In oral argument, counsel for the defendant submitted that PR5076 was a policy document that set the standard for the construction of rails on new and existing timber bridges, where replacement of more than 50% of posts was required. Whether the defendant's standard of care was met is determined in the context of the inspection and maintenance regime in place, including:

1. the design standard for timber barriers in place for bridges built before 2007;

2. the availability of public funds; and,

3. the decisions made by Mr. Deveau as the District Bridge Engineer in 2009 and 2010 respecting the inspection reports and the creation of the Priority List for upgrading existing timber bridge rails.

[262] Counsel notes that the plaintiff argued that the failure creating liability was not at the inspection level but at the decision-making level (Mr. Deveau, the District Bridge Engineer). What Mr. Deveau did at the operational level, beginning with his appointment in late 2009, was to collect and collate the inspection report results for all timber bridges in his district; to hire a person to check the bridges; to compile the data respecting each bridge in accordance with factors he determined (Ex. 3, Tabs 2, 3 and 4); to set priorities in accordance with the policy and

operational manuals in place (Ex. 4, Tabs 1, 2 and 3; Ex. 3, Tabs 8 through 13), and to create a Priority List (Ex. 3, Tab 5), which he then caused to be implemented.

[263] Mr. Deveau properly applied the bridge maintenance regime in respect of the inspection reports and the creation of the Priority List. There was no evidence that the procedure used or the factors considered were unreasonable. There were about 700 bridges in the Central District, of which about 200 were timber bridges. His duty was to upgrade all of the pre-2007 timber bridges to the PR5076 standard, either when more than 50% of the posts required replacement or in accordance with the policy for upgrading with the available resources on the basis of priority to the greatest risks to the safety of the motoring public.

[264] Dr. Wilson did not comment on the factors or inputs selected and considered by Mr. Deveau in creating the Priority List. Dr. Robinson did opine that the bridge maintenance system in place was consistent with the current highway safety practices and that the factors considered by Mr. Deveau in creating the Priority List to upgrade to PR5076 standard was reasonable.

[265] There was no evidence that the Timber Barrier Replacement Priority List (Ex. 3, Tab 5) was completed on the basis of irrelevant factors or carelessness or bad faith.

[266] The evidence was that the existing timber barrier was likely put in place in the 1970s or early 1980s, when MacPhee Brook Bridge was reconstructed. Mr. Deveau testified that such barriers were not crash tested nor designed to take the force of large vehicles, such as the Jimmy that Ketler was driving. It was only designed to give some resistance.

[267] Absent an accident reconstruction analysis, it is speculative to submit that the barrier on MacPhee Brook Bridge, had it been in better condition, would have deflected Ketler's vehicle. There is no factual basis for Dr. Wilson's opinion to that effect. There was no evidence that the pre-2007 barrier design standard would deflect a two-tonne Jimmy in the circumstances as existed on October 21, 2010.

[268] PR5076 created a new standard respecting timber rails for new timber bridges and for older bridges which required replacement of more than 50% of their posts. The standard that applied to pre-2007 timber bridges was the standard that applied when the barrier was constructed in the 1970s or early 1980s.

[269] The burden was on the plaintiff to establish what the design standard was at the time of construction of MacPhee Brook Bridge, and that the condition of MacPhee Brook Bridge did not meet that standard. Counsel submits that the plaintiff did not discharge that onus.

[270] Both Mr. Deveau and Dr. Robinson testified that the primary purpose of the timber rail was the delineation of the bridge and the provision of some resistance; Mr. Deveau added that it was to provide safety to pedestrians crossing the bridge. Neither testified that the pre-2007 design standard was intended to deflect a vehicle, specifically one like the Ketler vehicle, as no performance standards existed prior to the 2007 PR5076 standard.

[271] None of the inspection reports or photographs in evidence shows that 50% of the posts on the MacPhee Brook Bridge, specifically the east side of the bridge, were missing or needing replacement. None of the inspection reports disclosed a need to expedite the upgrading of the barrier system on MacPhee Brook Bridge, other than in accordance with the policy that directed the District Bridge Engineer was to prioritize the upgrading timber barriers and set out the factors he was to use.

[272] Upgrading the pre-2007 timber bridge barriers was a policy decision. It is only if the actions were carried out carelessly or negligently, particularly the actions of Mr. Deveau taken in respect of the implementation of that policy decision, that the defendant might be held liable for the resulting damages.

Plaintiff's oral reply submission

[273] The plaintiff repeated that at the time of construction, the timber rails were not rotten; however, 100% of the posts were rotten and needed replacement on October 21, 2010. The plaintiff submits that the court should not rely upon the observations of Carl MacPhee made on October 4, 2010, because he had no formal training as a bridge inspector. He was not familiar with and did not apply the NBI rating system.

[274] The plaintiff does not claim, nor have to prove, that if the barrier on MacPhee Brook Bridge was in perfect condition, it would have deflected Ketler's vehicle. This case is about the condition of the bridge at the time of the action and whether the defendant, in its maintenance and inspection program, took reasonable care.

Part 3 – The Law

Negligence

[275] Negligence is conduct that falls below the standard required by society. The law of negligence has many purposes, including to compensate victims for injuries caused by someone's careless conduct as well as to deter such careless conduct. The law is forever changing to meet new circumstances and changes in society's standards.

[276] The "ABC Rule", the traditional English formulation of the elements of negligence, requires the establishment of a duty of care between the parties, a breach of that duty, and damages caused by the breach.

[277] Each of these three seemingly-simple elements has been subdivided and parsed by courts into smaller bits for easier analysis and to adjust the test to differing circumstances. There is no universally accepted subdivision of, or order for analysis of, the elements of negligence, or even what "bits" must be considered at what part of the analysis.

[278] For example, Allen M. Linden and B. Feldthusen in *Canadian Tort Law*, 9th Edition, (Markham: LexisNexis, 2011) utilize a six-part analysis, which analyses the elements in reverse order to the traditional ABC rule. To make sense of the state of the law relevant to the facts of this case, this court has relied upon their insights, but not their analytical framework. For that (and for his insights), I adopt the more traditional "ABC" analysis as described by Lewis Klar in *Tort Law*, 5th Edition, (Toronto: Carswell, 2012).

The duty of care

[279] Being careless does not automatically make one liable for losses caused to others. Negligence law imposes restrictions as to which actors must observe a duty of care, what victims can claim compensation, what activities are covered and what categories of losses are compensable (Klar, p. 169).

[280] The duty analysis, in general terms, asks two questions: When does the loss impose a duty on an actor for the benefit of a victim? What policy reasons limit the types of actors, victims, activities and losses for which a duty exists?

[281] The modern concept of duty of care starts with the neighborhood principle. In *Donoghue v Stevenson*, [1932] A.C. 562 (H.L.), the court removed the concepts of privity of contract and a closed list of relationships between parties as a requisite for an actor being liable to a victim. It replaced these categories with a generalized duty to:

> … take reasonable care to avoid acts or omissions which you can reasonably foresee would be likely to injure your neighbour. … persons who are so closely and directly affected by my act that I ought reasonably to have them in contemplation as being so affected when I am directing my mind to the acts or omissions which are called in question.

[282] It soon became apparent that the reasonable foreseeability test alone did not allow for consideration of other values that impact whether a duty of care should arise.

[283] In *Anns v Merton London Borough Council*, [1978] A.C. 728 (H.L.), (*Anns*) the House of Lords imposed a two-stage test to determine duty of care. The two stages were described in the decision as follows:

> First one has to ask whether, as between the alleged wrongdoer and the person who has suffered damage there is a sufficient relationship of proximity or neighbourhood such that, in the reasonable contemplation of the former, carelessness on his part may be likely to cause damage to the latter – in which case a *prima facie* duty of care arises. Secondly, if the first question is answered affirmatively, it is necessary to consider whether there are any considerations which ought to negative, or to reduce or limit the scope of the duty or the class of person to whom it is owed or the damages to which a breach of it may give rise.

[284] In 1984, the Supreme Court of Canada adopted the *Anns* two-stage analysis in *Kamloops v Nielsen*, [1984] 2 SCR 2, (*Kamloops*). The test was adhered to, without modification, by the Supreme Court of Canada in many decisions over the next 17 years. See, for example, *Ryan v. Victoria*, at paras 23 to 27.

[285] In *Cooper v Hobart*, 2001 SCC 79, (*Cooper*), and *Edwards v LSUC*, 2001 SCC 80, (*Edwards*), the court reformulated the test to "hone the role of policy concerns" in the duty analysis. The court reintroduced some policy considerations at the stage-one analysis. Now at stage one, a court must consider two questions: (1) whether the harm caused was the foreseeably reasonable consequence of the act; and (2) were there factors (policy concerns) arising from the relationship of the plaintiff and defendant that, despite their proximity, should negate a duty of care. At stage two, residual policy concerns, extraneous to the relationship or proximity between the parties that might negate or restrict the *prima facie* duty, are considered.

[286] In subsequent decisions, the Supreme Court of Canada appears to have said that the proximity analysis (stage one, step two) is only required when the plaintiff alleges that a new form of duty arises.

[287] In *Odhavji Estate v Woodhouse*, 2003 SCC 69, (*Odhavji Estate*) and *Hill v Hamilton-Wentworth*, 2007 SCC 41, (*Hill*), the Supreme Court of Canada required that the plaintiff prove that:

(1) the harm was reasonably foreseeable;

(2) there was sufficient proximity between parties that it would not be unjust or unfair to impose a duty of care; and,

(3) there were no policy reasons to negate or restrict the duty.

[288] The first question at stage one – reasonable foreseeability, recognizes that in almost all activity there is some risk of injury to others. Complicating this analysis is the fact that foreseeability is also an important part of the breach of the standard of care analysis.

[289] This complication is ameliorated by two considerations: (1) courts look at foreseeability in a general sense at the duty of care stage of the analysis; they do not apply it to the specific factual matrix of the case before the court; and (2) since 2001, courts have put significantly more emphasis on 'proximity' and 'policy', the second and third elements of the duty of care analysis.

[290] Whether there is sufficient 'proximity' between the parties, such that it would be "fair and just" to impose a duty of care, is a question of law. Proximity is used to categorize and characterize the type of relationships by which a duty of care arises. In most relationships, the legal question of a whether a relationship is sufficiently proximate (that is, "close and direct") has already been decided in analogous cases or cases involving similar circumstances and no further analysis is necessary.

[291] Because negligence is an evolving tort, when claims of negligence promote a novel duty in the sense of the 'proximity' between the wrongdoer and the victim, the proximity analysis (stage one, step two) involving policy considerations becomes necessary and prominent. In public tort cases, proximity is often resolved by reference to the statute-imposed duties of statutory defendants.

[292] Even if a *prima facie* duty of care is found at stage one, it may be negated by broad policy considerations other than those related to the 'proximity' of the parties. This is the third element, or stage 2, of the duty of care analysis. No catalogue of, or limit to, these policy considerations exists. They include consideration of societal, economic and political values.

[293] These policy considerations are particularly relevant to defendants who are public institutions. Policy considerations include recognition of, and restraints on, the roles of the legislative and executive branches of government in passing laws, setting levels of taxation, making political and policy decisions, as well as prioritization of public expenditures. Lewis Klar writes that policy considerations and the duty of care analysis revolve around when ordinary negligence principles are, and are not, the appropriate forum than equity, public law and legislation, in assessing how actors, victims, activities and losses should be regulated.

[294] Once a plaintiff establishes a *prima facie* duty of care at stage one, the defendant must advance compelling reasons to negate the duty. Justification of an immunity or restriction on the duty requires evidence of a real potential for negative consequences, not merely speculation. For this, see *Hill supra*, at paras 46 to 48, and *Fullowka v Pinkerton's of Canada Ltd*., 2010 SCC 5, (*Fullowka*) at paras 56 to 57.

[295] Public authorities are, for many activities, subject to the ordinary principles of negligence. However, according to Lewis Klar, in chapter 8 of his text, there is a line between government activities that are subject to the ordinary principles of negligence law and those activities which promote a public interest and may harm a private interest, which activities ought not to be assessed by ordinary negligence principles. The identification by the Supreme Court of Canada in *Cooper/Edwards* of a separate 'proximity' policy factor changed significantly the assessment of when a duty of care is owed by government or its agencies.

[296] Absent an express statutory enactment imposing a duty on government in favour of a private individual (or a *Hedley Byrne* negligent advice scenario), the *Cooper/Edwards* analysis is followed. Normally the proximity factor (stage one, step two) requires the court to determine that the statutory authorization for the activity is intended to protect the interests of private persons before a duty of care arises. This involves statutory interpretation of the authorization. Absent a specific statutory duty to act in the interests of private persons, only where a statutory authority does something, which would give rise to a *prima facie* duty if done by a private individual, if proximity found.

[297] On the other hand, where specific statutory enactments require government to perform public functions, the statute creates a *prima facie* duty of care that fulfills stage one of the *Cooper/Edwards* test of foreseeability and proximity. An example relevant to this case is the

Public Highways Act, which expressly imposes on government a duty to maintain and repair public highways. The defendant conceded this duty in its pre-trial submissions.

[298] The primary policy consideration (at stage two of the *Cooper/Edwards* analysis) that limits or mitigates a *prima facie* duty of care arises from the dichotomy between a policy and operational decision. The former was described in *Anns* as the exercise of discretion by a public authority. Policy decisions are immune from ordinary negligence principles so long as the authority acts *bona fide*, or in good faith. Operational decisions are not immune from ordinary tort liability.

[299] In *Just v. British Columbia*, the Supreme Court of Canada defined policy decisions narrowly, and operational decisions and actions broadly. It determined that both the manner in which highway inspections were organized, and how they were carried out, were operational. It is relevant to the facts in this case that, in *Just*, the court held that budgetary allotments for departments should be classified as policy decisions.

[300] In subsequent decisions, starting with *Swinamer* and *Brown*, the Supreme Court rejected this narrow definition of policy decisions. The court held that a department's planning of a tree removal program (*Swinamer*) and creation of two different work schedules (summer and winter) for snow removal (*Brown*) were policy decisions and immune from the application of ordinary negligence principles, so long as the decisions were made in good faith.

[301] In *Kamloops*, the court found the defendant municipality liable because its decision not to consider enforcement proceedings was most likely made for improper reasons; therefore, it was not a policy decision taken in the *bona fide* exercise of discretion. Said differently, in *Kamloops*, the court found that the decision was a policy decision, which lost its immunity because it was not made in good faith.

[302] In summary, the Supreme Court of Canada has broadened its view of what constitutes a policy decision since *Just*.

[303] Other residual policy considerations at stage two of the duty of care analysis include: the court's hesitancy to second-guess political decisions of statutory authorities; the potential conflict of interest between government's duty to the public versus the plaintiff, or between the plaintiff and other private persons, whose interests may, *inter se*, be conflicting (*Cooper supra*); creation of indeterminate or inordinate liability; creation of a significant financial burden on taxpayers, and circumstances where the activity is purely legislative, judicial or quasi-judicial.

[304] In their text, Linden and Feldthusen organized their analysis of negligence law with the standard of care and causation analysis (ch. 4 to 8) preceding the duty of care analysis (ch. 9). In their view, the issue of whether a duty of care is owed should largely be limited to consideration of the policy issues - as a check on the other two analysis. Immunity is granted for otherwise negligent conduct. In their view, the emphasis in the duty of care analysis has evolved from foreseeability and proximity to policy.

[305] Like Klar, they agree that the modern approach, which started with the *Donoghue* neighborhood principle, evolved into a two-stage analysis: first, *Anns supra* imposed a two-stage test, adopted in Canada by *Kamloops*, followed for seventeen years until substantially modified in *Cooper* and *Edwards,* and further 'explained' in *Hill* and *Fullowka*.

[306] Linden and Feldthusen write that it is difficult today to successfully attack negligent government conduct through tort law by reason of the second stage of the *Anns* or *Cooper/Edwards* analysis.

[307] In their view, the residual policy considerations that negate a duty at the second stage, as listed in *Cooper*, should be relied upon only if they are seriously overriding, convincing or compelling. They should not be based upon speculation but the real potential for negative consequences.

[308] They appear to opine that the stage-two analysis is most relevant to government or public authority defendants as developed in the policy-operational dichotomy. They appear to agree with Klar's interpretation that, in *Brown* and *Swinamer*, the Supreme Court has broadened immunity (absent proof of bad faith or irrationality) by broadening what constitutes a policy decision.

[309] While suggesting that some of the post *Cooper/Edwards* decisions are inconsistent, they appear to acknowledge that, in respect of government authorities who undertake road maintenance, only a narrow range of decisions are operational and therefore not immune from ordinary negligence principles, and that decisions based on budgetary considerations are policy decisions.

The standard of care

[310] The B in the ABC Rule relates to the standard of care and what constitutes breach of the duty of care. Linden and Feldthusen (ch. 5 to 7), and Klar (ch. 9), appear to agree on the legal analysis of this second element.

[311] Conduct is negligent if it creates an unreasonable risk of harm. Not all risky conduct is negligent.

[312] In determining whether a risk is unreasonable, the court balances the danger created by the conduct with the utility of the conduct: "If the hazard outweighs the social value of the activity, liability is imposed; if it does not, the defendant is exonerated" (Linden and Feldthusen, p. 134).

[313] Liability ultimately rests on the determination of whether the risk of harm is perceived as reasonable or unreasonable.

[314] Learned Hand expressed this notion in a formula: liability depends on whether B (the burden of adequate precaution) is less than P (the probability of injury) and L (the seriousness of the injury, if it occurs).

[315] Klar writes that the Hand formula provides an economic analysis of a negligence conduct. He adds that: "A reasonable risk … is one whose costs of avoidance is greater than the probability of the injury multiplied by its severity … An unreasonable risk … is one whose cost of avoidance is less than the probability of injury multiplied by its severity." (p. 355).

[316] Linden and Feldthusen add a fourth element to the Hand formula: (i) the chance, probability or likelihood of harm times; (ii) the gravity or severity of the potential loss is measured against; (iii) the purpose or object of the act times; and, (iv) the cost or burden to the actor to remove the risk (p. 134).

[317] The likelihood of injury is essentially a question of statistical fact. The severity of injury speaks for itself. The cost of avoidance is not simply an economic issue. It includes activity that can only be made safer by altering it significantly or risking the loss of the valuable objective or utility of the activity (for example by significantly reducing speed limits on all roads).

[318] Despite the Hand formula, risk assessment is not an exact science. It considers economic and non-economic issues. The measure of whether a risk of harm is reasonable or unreasonable is measured on an objective (not a subjective) standard.

[319] The duty is to exercise reasonable care – care that would be taken in the circumstances by a reasonable person (also often described as a "prudent" or "careful" person).

[320] A difficult analysis arises from the fact that the measure of a reasonable person in any case specifically does not include the trier of fact, whether judge or jury, nor any particular individual with his or her own idiosyncrasies. Rather, the reasonable person is a non-existent, mythical person whose standard of reasonableness is that "adopted by the community by persons of ordinary intelligence and prudence" (Klar, p. 344).

[321] The resort to an impersonal test (Klar), or elimination of the personal equation (Linden and Feldthusen), is aimed at ensuring the application of an objective determination, independent of the parties or the idiosyncrasies of any particular person or of the trier of fact.

[322] The reasonable person is not perfect, nor "a person of infinite resource and sagacity", nor a person having the wisdom of Solomon, nor a person with the benefit of hindsight.

[323] The reasonable person is not obligated to exercise the best possible judgment or to avoid all possible risks.

[324] The law presumes the reasonable person possesses a certain level of intelligence but is free of over-apprehension or from over-competence. This is qualified only by the fact that

persons possessing superior knowledge are expected to act in accordance with that superior knowledge.

Causation

[325] The "C", in the ABC Rule, is causation. It has two dimensions: cause in fact; and cause in law. Only after establishment of cause in fact, that is, that the defendant's negligent act actually caused the plaintiff's loss, does the court enter into an analysis of whether the connection between the negligent act and the loss was "proximate" or "remote".

[326] The law respecting the first issue – cause in fact, was subject to some ambiguity until the Supreme Court of Canada decision in *Clements v Clements*, 2012 SCC 32, despite David Chiefetz's suggestion to the contrary in "Factual Causation in Negligence After Clements", 41 Adv Q 179, June 2013.

[327] I agree with the observations of Shantona Chaudhury and Erik S. Knutsen that *Clements* restored *Snell v Farrell*, [1990] 2 SCR 311, as the guiding light for judges faced with difficult causation cases, minimizing the significance of material contribution, and emphasizing that the "but for" causation test *must* be applied in a robust common-sense fashion. (Chaudhury, Shantona, "Causation in the Law of Negligence: Where are we now? Where are we going? *Clements v Clements*; *Ediger v Johnston*", 40 Adv Q 257, September 2012, and Knutsen, Erik S., "Coping with Complex Causation Information in Personal Injury Cases", 41 Adv Q 149, June 2013)

[328] The Supreme Court's description of the cause in fact analytical framework is articulate and comprehensive. It reads in part:

> [6] On its own, proof by an injured plaintiff that a defendant was negligent does not make that defendant liable for the loss. The plaintiff must also establish that the defendant's negligence (breach of the standard of care) *caused* the injury. That link is causation.
>
> [7] Recovery in negligence presupposes a relationship between the plaintiff and defendant based on the existence of a duty of care – a defendant who is at fault and a plaintiff who has been injured by that fault. …
>
> [8] The test for showing causation is the "but for" test. The plaintiff must show on a balance of probabilities that "but for" the defendant's negligent act, the injury would not have occurred. Inherent in the phrase "but for" is the requirement that the defendant's negligence was *necessary* to bring about the injury – in other words that the injury would not have occurred without the defendant's negligence. …

[9] The "but for" causation test must be applied in a robust common sense fashion. There is no need for scientific evidence of the precise contribution of the defendant's negligence made to the injury. …

[10] A common sense inference of "but for" causation from proof of negligence usually flows without difficulty. Evidence connecting the breach of duty to the injury suffered may permit the judge, depending on the circumstances, to infer that the defendant's negligence probably caused the loss. …

[11] Where "but for" causation is established by inference only, it is open to the defendant to argue or call evidence that the accident would have happened without the defendant's negligence, i.e. that the negligence was not a necessary cause of the injury, which was, in any event, inevitable. …

…

[13] To recap, the basic rule of recovery for negligence is that the plaintiff must establish on a balance of probabilities that the defendant caused the plaintiff's injury on the "but for" test. This is a factual determination. Exceptionally, however, courts have accepted that a plaintiff may be able to recover on the basis of "material contribution to risk of injury", without showing factual "but for" causation. … this can occur in cases where it is impossible to determine which of a number of negligent acts by multiple actors in fact cause the injury, but it is established that one or more of them did in fact cause it. …

[14] "But for" causation and liability on the basis of material contribution to risk are two different beasts. "But for" causation is a factual inquiry into what likely happened. The material contribution to risk test removes the requirement of "but for" causation and substitutes proof of material contribution to risk. …

[15] … "material contribution as a substitute for the usual requirement of "but for" causation only applies where it is impossible to say that a particular defendant's negligent act in fact caused the injury. …

[16] … A defendant in an action in negligence is not a wrongdoer at large: he is a wrongdoer in respect of the damage which he actually causes to the plaintiff' … For that reason, recourse to a material contribution to risk approach is necessarily rare, and justified only where it is required by fairness and conforms to the principles that ground recovery in tort.

[21] … The usual requirement of proof of "but for" causation should not be relaxed where the result would be to permit plaintiffs to recover in the absence of evidence connecting the defendant's fault to the plaintiff's injury. … Sopinka J. stated that if the injury likely was brought about by neutral factors, that is, it would have occurred absent any negligence, the plaintiff cannot succeed. To

> allow recovery where the injury was the result of neutral factors would neither further the goals of compensation, fairness and deterrence, nor comport with the theory of corrective justice that underlies the law of negligence.

[329] The facts in this case do not invite consideration of the alternate "material contribution to risk of injury" as a basis for liability. The factual matrix does not involve multiple defendants and multiple negligent acts, one of which (it being impossible to tell which one) did in fact cause the injury (Knutsen, p. 155).

[330] The second causation issue – proximity or remoteness, was not before the court in *Clements*. This legal issue deals with whether a negligent defendant's act was a proximate cause of the plaintiff's injury or whether it was too remote. Linden and Feldthusen write that this issue is distinct from, although often improperly intermingled with, the cause in fact analysis. They suggest that the current approach for determining the scope of liability, once causation in fact is established, varies with the uniqueness of the factual matrix of each case.

[331] In common situations, case law provides expected standards for measuring foresight. These include, for example, the thin-skull situation and rescue cases.

[332] Linden and Feldthusen reads, at page 378:

> Simply stated, the issue here is whether the defendant, whose conduct has fallen below the accepted standard of the community, should be relieved from paying for some unusual damage that his conduct helped to bring about. By formulating the question in this way, we spotlight the value choice which must be made in disposing of the case. There is no need to disguise the fact that some intuition and feeling are involved in this determination, but we must also insert as much rationality as we can into the process. A new approach to the remoteness would recognize this basic truth.

Continuing on page 381:

> Some courts have openly admitted that they are utilizing a hindsight test in these cases. In other words, looking back, the court must find that the accident was extraordinary in order to relieve a defendant of liability.
>
> In deciding remoteness questions, therefore, the court should approach them with an open mind, without the blinkers of directness or foresight. At the outset it should be recognized that denying liability for some particular though unusual harm caused by a negligent defendant should be a rare event. All the tests enumerated above should be exploited. The ideas of risk and foresight are a helpful beginning. In addition, however, certain policy factors should be assessed. If the case deals with a personal injury rather than a property loss, this should be considered. … The potential for deterrence and education must be examined. … Lastly, general or market deterrence may be accomplished by transferring the

> entire cost of mishaps to the activity which produces them. It is only after full consideration of all of these policy matters and after employing each of the available tests that a court should undertake to decide a case. …

[333] In his text, Klar asks the same question, makes the same observations and concludes at page 487:

> … ultimately all remoteness questions will be decided by the application of common sense, pragmatics and politics. …

At page 495 he adds:

> In recent years, the courts have been frank in admitting that the reasonable foreseeability test, whether defined in terms of probable or possible risks, has been a useful shield, behind which the judicial policies dictating the resolution of remoteness questions can be hidden. …
>
> One can refer to several cases in which courts have frankly recognized the policy content of the remoteness question.

And at page 496:

> It is clear that "instinct" and "intuition" are not satisfactory tests of remoteness. Certainty and predictability surely require that courts do better than that in articulating those facts which direct them to the resolution of remoteness problems.

[334] There appears to be considerable overlap between the analysis of proximity at stage one step two in the duty of care analysis and the analysis respecting causation in law.

Application of law to facts

Part I Duty of care analysis

[335] The Supreme Court of Canada decisions summarized above require this court to consider three questions:

#1 Was the harm / injury reasonably foreseeable? (Stage 1, Step 1)

#2 If so, is the relationship between the plaintiff and the defendant sufficiently "close and direct" (proximate) that it is not unfair to impose a duty of care on the defendant? (Stage 1, Step 2)

#3 If a *prima facie* duty of care is found at Stage 1, do any policy considerations, based on political, economic or societal values, negate or limit the *prima facie* duty of care? (Stage 2)

[336] The onus is on the plaintiff for questions #1 and #2, and on the defendant for question #3. If a duty of care is found, this court must still consider whether the plaintiff has established that the defendant has breached the appropriate standard of care, and, if so, whether that breach was the factual and proximate cause of the harm or injury to the plaintiff.

[337] The first two questions (Stage 1, Steps 1 and 2) are not really in dispute. The defendant acknowledges a *prima facie* duty of care has been established at Stage 1. At Stage 1 Step 1, the harm or injury was, in a general sense, reasonably foreseeable. At Stage 1 Step 2, the *Public Highways Act* (ss. 4 and 5) imposes a statutory duty on the defendant to reasonably maintain public highways to best insure the safety of users of the highways.

[338] In their closing submissions, counsel disagree on whether PR5076 in DTIR's Policies and Procedures Manual was a policy decision, which, when taken in conjunction with budget restraints affecting the maintenance of highways in Nova Scotia, limits the defendant's duty of care in the circumstances of this case.

[339] The plaintiff submits that PR5076 and related Procedure Numbers PR5072 and PR5061, and the inspection procedures directive (Ex 3, Tab 8) involve implementation of policies and are not true policy decisions. The plaintiff relies upon the 1989 decision of the Supreme Court of Canada in *Just v. British Columbia* for limiting the scope of policy decisions.

[340] I do not agree with the plaintiff. The scope of policy decisions, since *Just*, such as those described as policy decisions in *Swinamer* and *Brown* (and *Leddicote*), are similar to the policy decisions reflected in the new standard for timber bridge barriers created by PR5076. That document is a policy statement, which set a new technical standard for, and the timing of implementation of that standard for, timber bridge barriers. PR5076 did not provide that the new technical standards were to be applied to every existing timber bridge barrier immediately, but rather required barriers to be maintained to the standard of the time when they were constructed until 50% of the posts on either side of the bridge required replacement. I accept the defendant's evidence that the matrix that mandated upgrading to the new technical standard in PR5076 did not exist on or before October 21, 2010. This is clear in the thorough evidence of Guy Deveau and Dr. Robinson, whose evidence (and opinions in the case of Dr. Robinson) were thorough, logical, and supported by the documentary evidence. I relied on their evidence in preference to any other evidence.

[341] The defendant, primarily through the evidence of its bridge engineer Mr. Deveau and through Dr. Robinson, established that the bridge engineer's action in the creation of the Replacement Priority List was reasonable. The creation of the Replacement Priority List was a proactive action by the bridge engineer to provide for an orderly replacement of old timber bridge barriers to the new technical standard set out in PR5076. Placement on the list did not mean that, if 50% or more of the posts on a barrier required replacement, the barrier would not

be replaced immediately, but would wait until its place on the priority list. The evidence was clear that whenever a timber bridge barrier met the criteria for replacement to the new technical standard as set out in PR5076 that it would be done, the effect of which would be a delay in upgrading timber bridge barriers on the priority list that had not yet been upgraded.

[342] PR5076, the defendant's policy decision was reasonable. It did not require immediate replacement of timber bridge barriers to the new technical standards. The court notes that by the time that the Replacement Priority List for the portion of East Hants in the Central District was in place in early 2010, that 29 of the 80 bridges with timber barriers already met the new standard and MacPhee Brook Bridge was in 28th place on the list of 51 timber bridge barriers remaining to be upgraded to the new standard. Mr. Deveau's evidence on the basis of placing this bridge barrier for upgrading on the list was thorough, logical, reasonable and consistent with the policies in DTIR's manual.

[343] The research, methodology, factors or analysis employed by the bridge engineer in creating the Replacement Priority List for timber bridge barriers was carried out in a reasonably careful manner, without negligence. Counsel for the plaintiff submitted that, based on the contents of Level 1 and Level 2 inspection reports over a thirteen year span, the bridge engineer was negligent in failing to place the upgrading of this barrier much higher on the priority list. No evidence was put before the court, either directly or through cross-examination (particularly of Mr. Deveau, whose evidence was given in a clear, direct, credible manner and whose evidence the court relied upon), that would suggest that the factors that he relied upon and the methodology that led him to place this barrier in 28th spot was deficient, unreasonable or negligent.

[344] In determining the scope of the duty of care, I conclude that PR5076 did not require replacement of the timber bridge barriers on MacPhee Brook Bridge immediately after May 25, 2007, or at any time before October 21, 2010 to the new standard in PR5076. Neither 50% or more of the posts on either side of the bridge nor 50% of the existing bridge barrier required replacement on October 21, 2010. Said differently, I am satisfied, based on the evidence before the court, that 50% or more of the posts on either side of the bridge did not require replacement.

[345] The duty of care owed by the defendant was to maintain the timber bridge barriers to the standard which applied at the time of their original construction, which standard was the standard in place when the bridge was substantially reconstructed in the late 1970's or early 1980's. Dr. Robinson's evidence described how after 1985, the research and discussions respecting establishing new standards for guardrails evolved, resulting in the new technical standards incorporated in PR5076.

[346] The standard of care based on the technical standards at the time this bridge's barriers were constructed is dealt with in Part II of this analysis.

[347] Both counsel refer the court to the trial and Court of Appeal decisions in *Leddicote*. In that case, Ms. Leddicote lost control of her car in slush on a highway, skidded and was rear-

ended by a vehicle driven by Ms. Patterson. She sued the province with respect to the condition of the highway and Ms. Patterson for following too closely.

[348] The trial court apportioned liability between Ms. Leddicote and Ms. Patterson, 90% against Leddicote and 10% against Patterson. The unanimous Court of Appeal upheld the trial court's decision that the province's policy was reasonable and reasonably carried out; therefore, the province did not breach the duty and standard of care owed to the plaintiff. Justice Saunders agreed with the trial decision on apportionment. Justice Cromwell and Chief Justice Glube adopted Justice Saunders reasons, except for the apportionment of liability between Ms. Leddicote and Ms. Patterson. The trial decision predated *Cooper* and *Edwards*. The Court of Appeal decision, dated April 5, 2002 (heard January 21, 2002), did not refer to the important decisions of the Supreme Court of Canada in *Cooper* and *Edwards*, delivered on November 16, 2001, nor did the Court of Appeal have the benefit of the subsequent Supreme Court of Canada decisions in *Odhavji Estate*, *Hill* and *Fullowka*.

[349] In finding the defendant province not liable, the trial judge at paras. 20 to 31 relied on the Supreme Court of Canada decision in *Ryan* and, through it, the House of Lords decision in *Anns*. It appears that Justice Tidman did not conduct the analysis as described in *Cooper* and *Edwards*. At paragraph 26 he simply concluded that there was proximity between the parties and that the province did raise as an issue that it did not have a duty of care. At paragraph 27, he described the standard of care as follows:

> Maintenance and care of public highways in the province is provided for in the *Public Highways Act*, R.S.N.S. 1989 c. 371. There is nothing in the *Act*, however, that either expressly mandates the provincial government to maintain public highways in a particular way or excuses it from doing so. Rather, the courts over time have determined the standard of care for maintenance of public highways. The courts have made it clear that the province has a duty to take reasonable care in maintaining public highways to best ensure the safety of the driving public. The standard is not so rigid as to hold the province to be a virtual insurer against harm to the public using the highways. It is, for instance, unreasonable to demand that after a snowstorm every highway be immediately cleared of ice and snow. Allowance must be made for priorities to be established in maintenance depending on the degree of use of the highway with the busiest highways being cleared first. For instance, in the application of salt to slippery highways it is reasonable to expect that during or after a storm salt would be applied to the Sydney By-Pass before being applied to the highway leading into Meat Cove. Consequently, the province is required to take reasonable care, including prioritizing, to ensure that public highways are safe for use by the travelling public.

[350] In respect of whether the province breached the standard of care, he wrote at para 30:

> … I find that the Department of Transportation had in effect a reasonable policy to ensure that the highways, and particularly Highway 101, are properly cleared of

> snow and ice during and after storms. I also find that on the day in question that policy was adequately carried out by Mr. Slaunwhite. It may be that snow was left on the highway that formed the slush patch in issue or it may be that the slush accumulated in the area as a result of automotive traffic on the highway. In either event it is not unreasonable to expect to find various accumulations of snow or slush on the highway during and after snow storms and in this case immediately after a snow storm.

[351] The Court of Appeal in *Leddicote* cited the Supreme Court of Canada in *Ryan* and another 2000 decision, *Ingles v Tutkaluk Construction Ltd.*, [2000] 1 SCR 298, where it affirmed the trial judge's finding that the province owed a duty of care. It quoted para 27 with respect to the standard of care and added that the standard of care did not make the province an insurer, but only imposed a standard of reasonable care and, citing para 30 of the trial decision, the Court of Appeal held that the trial judge properly applied the law to the evidence; that is, that the defendant province had adequately carried out a reasonable policy.

[352] Since 2001, the Supreme Court of Canada has expanded upon the negation and limitation of the duty of care in respect of government actions and broadened considerably the scope of what constitutes a policy decision in respect of which government exercises discretion, which when exercised in good faith courts will respect.

[353] The evidence in this case is clear. MacPhee Brook Bridge was believed to have been first constructed in the early 1900s and substantially reconstructed in the late 1970s or early 1980s. The railings for that bridge met the standards for railings at the time it was reconstructed. Their purpose, as described by Dr. Robinson, was primarily to delineate the side of bridges and provide protection for pedestrians. He noted that barriers were designed to provide some resistance to penetration for roads other than low volume roads (by the AASHTO standard), but not in respect of low volume roads. The technical standard for barriers, before PR5076 were not based on dynamic crash testing.

[354] As a result of fatalities on small wooden bridges in icy conditions before 2007, the province adopted a new technical standard for timber bridge barriers as of May 2007, in the form of PR5076. PR5076 set out a new standard for construction of timber bridge barriers and a policy directive as to when those barriers would have to be replaced with barriers meeting the new technical standard.

[355] The policy set out three technical standards, dependent on the volume of traffic, the height of the bridge over the body of water, the road grade-in, and the road curvature approaching the bridge. The policy did not provide for immediate replacement of all previously constructed timber bridge barriers to the new standard. The policy specifically provided that "area managers and district bridge engineers are responsible and accountable for the implementation of this procedure." The policy specifically set out when repair would be to the old standard and when repair would be to the new standard.

[356] Pursuant to PR5076 the defendant investigated the condition of all timber bridge barriers in the Central District, listed all of the relevant factors identified in PR5076 and created a Replacement Priority List for upgrading timber bridge barriers before they were required to be upgraded, as financial resources were available. Mr. Deveau described the process in detail. The Replacement Priority List did not affect the obligation of the defendant to replace timber bridge barriers to the new standard, where 50% or more of the posts required replacement, or to reinstate to the standard which applied to the original construction where repairs affecting less than 50% of the posts required replacement.

[357] The defendant, through its witnesses, satisfied the court that:

a) the purpose of the barrier on the MacPhee Brook Bridge before PR5076 was primarily to delineate the edge of the bridge for vehicles and pedestrians;

b) the posts and rails were repaired, as needed; and,

c) there was a plan to repair and replace existing timber bridge barriers up to the new PR50765 standard before PR5076 mandate their replacement, based on a prioritization of the risks to the traveling public and the budget monies available to implement the new 2007 technical standard.

[358] Based on the totality of the defendant's evidence, I am satisfied that the implementation of PR 5076 was a reasonable response to the risk of the traveling public and that it was carried out in a reasonable manner.

[359] Policy PR5072 made the bridge engineer responsible for setting the priorities and ensuring the annual inspections, repairs, restoration and construction of bridges were carried out in accordance with plans for capital and non-capital maintenance, both major and minor. This is the policy that the defendant had in place. It was reasonably carried out by the defendant.

Part II Standard of care

[360] I conclude from the whole of the evidence that on October 21, 2010, the curb on the east side of the MacPhee Brook Bridge was missing; that the ends of some of the railings - that is, the horizontal pieces, appeared to contain rot; and, at least on the west side of the bridge, and likely on the east side, the railing was not rigidly attached to the bridge - that is, it was wobbly. This state of repair of MacPhee Brook Bridge timber rails is consistent with the observations in the Level 1 and Level 2 inspection reports. While the court is satisfied that the area operations supervisor affected minor maintenance and repair to the barriers, to within a few weeks before this accident, the timber railings were not up to their condition at the time of their construction, which I take to be the late 1970s or early 1980s. That standard was not the new technical standard identified in PR5076.

[361] I accept Dr. Robinson's and Mr. Deveau's evidence with respect to the standards that existed for timber bridge barriers before PR5076. Previous to the new standards identified in

PR5076, railings were not crash tested and they were primarily designed to delineate the bridge, make pedestrian crossing safer and to provide some deflection at low speeds, in certain circumstances, when struck at certain angles.

[362] To the extent that the barrier on the east side of MacPhee Brook Bridge was not maintained to the condition when it was constructed in about the late 1970's or early 1980s, the defendant breached the standard of care it owed to the plaintiff.

Part III Causation in fact

[363] The plaintiff must prove that the negligence of the defendant in fact caused his injury. In this case, the plaintiff must prove the defendant's failure to maintain the timber bridge barrier on the east side of the bridge to the condition at the time of its original construction, caused his harm or injury; said differently, that the failure of the defendant to maintain the bridge to the standard of the late 1970s or early 1980s, made a difference in the injury he suffered.

[364] On direct and cross-examination, Dr. Wilson acknowledged that he was not aware of any accident reconstruction investigation having been carried out in respect of this accident, nor did he have any data that would enable him to express an objective determination of whether a barrier built to the new 2007 technical standard or the former AASHTO standard would have kept the plaintiff's vehicle from veering off the bridge.. In addition, he was unaware, and the court is satisfied that there was no evidence, that described enough particulars of how the plaintiff's vehicle veered through the barrier so as to find or infer that the railing would probably have redirected the vehicle to a safe stop on the bridge. The particulars would include the mass of the plaintiff's Jimmy; where on the bridge the railing was struck; the angle at which the plaintiff's vehicle struck the railing; and, the speed at which the vehicle was driving at the time that a deer ran out into the plaintiff's path and he struck the railing.

[365] In order for the plaintiff to establish that the defendant's negligence in failing to maintain the pre-2007 standard for timber bridge barriers would have caused him not to go over and off the bridge, he would have to satisfy the court that the pre-PR5076 technical standard for the barrier would probably have prevented him from going through the railing and off the bridge. In *Snell*, Justice Sopinka made it clear that causation in fact need not be established to scientific certainty, but he and the Supreme Court in *Clements* were clear that there must be some evidence from which the court, applying common sense, can infer that the vehicle in this case would likely not have gone off the bridge if the timber railing had been to the standard of its original construction in the late 1970s or early 1980s.

[366] There is no evidence from which the court can determine whether this railing, maintained to that standard, would have prevented Mr. Ketler's vehicle from careening off the bridge. Speculation is not permissible.

[367] The plaintiff has not established factually, on a balance of probabilities, that but for the failure of the defendant to maintain the bridge barrier to the condition at the time of its construction, the plaintiff's vehicle would not have gone off the bridge.

Conclusion

[368] The duty of care on the defendant was to maintain the timber bridge barrier to the standard that applicable to the original construction in the late 1970s or early 1980s, and not to the technical standards in PR5076.

[369] The barrier on the east side of MacPhee Brook Bridge probably did not meet that standard on October 21, 2010.

[370] I am satisfied, based primarily on the evidence of Dr. Robinson, that a timber barrier maintained to the condition at the time of its construction on this low volume road was not intended, and would not have prevented the Ketler vehicle from careening off the bridge.

[371] I am not satisfied that the condition of the timber barrier on the east side of MacPhee Brook Bridge on October 21, 2010, made a difference with regards to whether the Ketler vehicle would have gone over the bridge, which event caused the harm and injury for which Mr. Ketler claims damages.

[372] The plaintiff's action is dismissed.

[373] The court will receive written submissions respecting costs if the parties are unable to agree.

Warner, J.