



# SPRING MEETING

May 21-24, 2017  
Sheraton Centre Toronto Hotel  
Toronto, Canada



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## Wi-Fi Info

**Network:** Sheraton Meetings

**Password:** thecasinstitute17

## Continuing Education

The CAS Continuing Education Policy applies to all ACAS and FCAS members who provide actuarial services. Actuarial services are defined in the CAS Code of Professional Conduct as “professional services provided to a Principal by an individual acting in the capacity of an actuary. Such services include the rendering of advice, recommendations, findings or opinions based upon actuarial considerations.” Members who are or could be subject to the continuing education requirements of a national actuarial organization can meet the requirements of the CAS Continuing Education Policy by satisfying the continuing education requirements established by a national actuarial organization recognized by the Policy.

This activity may qualify for up to 15.2 CE credits\* for the Spring Meeting for CAS members. Participants should claim credit commensurate with the extent of their participation in the activity. CAS members earn 1 CE credit per 50 minutes of educational session time, not to include breaks or lunch.

*\*The amount of CE credit that can be earned for participating in this activity must be assessed by the individual attendee. It also may be different for individuals who are subject to the requirements of organizations other than the American Academy of Actuaries.*

## Consent to Use of Photographic Images

Registration and attendance at or participation in CAS meetings, seminars and other activities constitutes an agreement by the registrant to the CAS’s use and distribution (both now and in the future) of the registrant or attendee’s image or voice in photographs, videotapes, electronic reproduction and audiotapes of such events and activities.

## Antitrust Notice

The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws. Meetings conducted under the auspices of the CAS are designed solely to provide a forum for the expression of various points of view on topics described in the programs or agendas for such meetings. Under no circumstances shall CAS meetings be used as a means for competing companies or firms to reach an understanding — expressed or implied — that restricts competition or in any way impairs the ability of members to exercise independent business judgment regarding matters affecting competition. It is the responsibility of all meeting participants to be aware of antitrust regulations, to prevent any written or verbal discussions that appear to violate these laws, and to adhere in every respect to the CAS antitrust compliance policy.

For more complete information regarding the CAS antitrust compliance policy, please refer to the CAS Website at <http://bit.ly/20UMw6Z>.

## Casualty Actuarial Society's Envisioned Future (from the CAS Strategic Plan)

The CAS will be recognized globally as the premier organization in advancing the practice and application of casualty actuarial science and educating professionals in general insurance, including property and casualty and similar risk exposure.

### CAS Program Planning Committee

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## CAS Meeting App — Sponsored by Pinnacle Actuarial Resources, Inc.

Download the free CAS Meeting app to your smartphone or tablet and make the most of your time while you're with us at the meeting. Get real-time schedule and speaker updates, the most current version of the list of attendees, maps of the hotel property and meeting space, and more! You can also follow the Spring Meeting Twitter feed and join the conversation.



**iPhone and iPad users** — search “casualty actuarial society” on the Apple App Store.

**Android users** — search “casualty actuarial society” on the Google Play Store.

**Blackberry, Windows, others** — go to this address on your smart phones (omit www): [cas.gatherdigital.com](http://cas.gatherdigital.com).

One of the features of the mobile app is that you and other attendees will have the option to send messages to each other through the app. It's a great way to network with fellow attendees up to and during the event. You may also create a profile of yourself that other event attendees can view. To enable this optional feature, open the app, go to **More** and then **My Account** to establish a password. Please use the email that you used to register for the conference.

**NEW:** Exhibitor Raffle check-in via mobile app. Visit each exhibit booth, check in with the code given by a booth representative, and you can be entered to win a \$250 American Express Gift Card! Winner will be announced at the end of the conference.

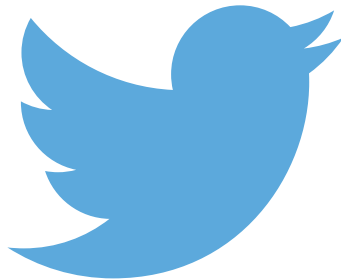
## Wireless Access — Sponsored by The CAS Institute

Attendees of the CAS Spring Meeting have access to complimentary Wi-Fi in the meeting rooms.

### Wi-Fi Info

**Network:** Sheraton Meetings

**Password:** thecasinstitute17



### Tweet from the 2017 Spring Meeting! #CASspring

What's happening at the 2017 Spring Meeting?

We want to hear from you! Tweet about the Spring Meeting educational sessions and meeting events using the hashtag #CASspring.

### Follow the CAS on Twitter @CASact

Not using Twitter yet?

Text “CASact” to 40404 to Follow the CAS on Twitter

And Follow the Prompts to Sign Up!

## Social Media

**The CAS is on Facebook, Twitter and LinkedIn!** Stay informed by following the CAS on social media for exclusive updates on CAS activities! The CAS Facebook, Twitter and LinkedIn pages will feature many different topics including conference updates, online discussions and industry updates. Join and connect with peers and colleagues and discuss issues important to you.

If you cannot access Facebook, Twitter and LinkedIn from your office, please consider signing up to follow us from your personal account at home.



Please visit our website at [casact.org](http://casact.org) and click the social media widgets to find our pages!

## General Information

For more information on the following, please consult the CAS Spring Meeting website, [www.casact.org/spring](http://www.casact.org/spring), or the Spring Meeting app on your smartphone.

## Speaker Opinions

The opinions expressed by speakers at this event are their own and do not necessarily reflect the positions of the CAS.

## Registration Hours

The registration desk will be open as follows:

- **Sunday, May 21**  
4:00 p.m. – 6:30 p.m.      Registration - Concourse Checkroom
- **Monday, May 22**  
7:00 a.m. – 11:30 a.m.      Registration - Concourse Checkroom  
12:45 p.m. – 2:00 p.m.      Registration - Concourse Checkroom
- **Tuesday, May 23**  
7:00 a.m. – 2:00 p.m.      Registration - Concourse Checkroom
- **Wednesday, May 24**  
7:00 a.m. – 11:30 a.m.      Registration - Concourse Checkroom

## Hotel Information

Sheraton Centre Hotel  
123 Queen St. W.  
Toronto, ON M5H 2M9, Canada  
Main Phone: +1-416-361-1000

Checkout time is 12:00 p.m. Those checking out before the conclusion of the meeting may check their bags at the bell desk of the hotel. The CAS is not responsible for lost or stolen items left unattended in public areas of the hotel. CAS staff is unable to accept any bags or other personal items at the registration desk.

Security Note: When leaving the meeting room for an extended period of time, please take valuables and personal belongings with you. Neither the CAS nor the Royal Pacific Resort may be held responsible for lost or stolen items.

## Emergency Information — Meeting Place, After Hours Phone Number and Area Medical Facilities

**Emergency Meeting Place:** In case of emergency or phone/internet outage, please meet at the Fountain at Nathan Philips Square located across Queen Street from the Sheraton Centre Toronto Hotel.

**For Assistance After Regular CAS Registration Desk Hours:** 703-862-4815.

### Nearby Hospitals and Pharmacies

Toronto General Hospital  
Address: 200 Elizabeth St, Toronto, ON M5G 2C4  
Phone: (416) 340-4800  
Hours: Open 24 hours

St. Michael's Hospital  
Address: 30 Bond St, Toronto, ON M5B 1W8  
Phone: (416) 360-4000  
Hours: Open 24 hours

Rexall Pharmacy  
Address: 250 University Ave, Toronto, ON M5H 3E5  
Hours: Open 24 hours  
Phone: (416) 591-6493

Shoppers Drug Mart  
Address: 260 Queen St W, Toronto, ON M5V 1Z8  
Hours: 8AM–12AM  
Phone: (416) 979-3903

### Attendee Lounge

Need a quiet space for a short break? Are you a Toronto local seeking a spot within the Sheraton to relax for a spell? Please feel free to visit the CAS Lounge in Wentworth (2nd floor) where there will be tables, chairs and a water station ready to help you recharge. The lounge is available throughout the Spring Meeting.

### Suggested Attire

Business casual attire is suggested for the conference sessions and receptions. It is best to wear layered clothing as meeting rooms tend to fluctuate in temperature.

In Toronto, the average high temperature during May is 65 degrees F / 18 degrees C and the average low is 43 degrees F / 6 degrees C.

### Celebration of New Members

#### **Monday, May 22, 8:00 a.m. – 8:30 a.m., Grand Ballroom West & Centre with Foyer**

All meeting attendees are invited and encouraged to attend this session — come celebrate the achievements of new CAS members and listen to the Address to Members, presented by former CAS President Mike Fusco.

### Tuesday Buffet Dinner at The Hockey Hall of Fame and Museum

#### **6:30 p.m. – 9:30 p.m.**

Attendees can lace up their skates and head to the Hockey Hall of Fame and Museum in downtown Toronto for Tuesday evening's buffet dinner.

The lower level of the museum offers hockey enthusiasts fun and entertaining insights into the history of the sport, courtesy of the largest collection of hockey memorabilia in the world. Guests can also explore the museum's numerous interactive exhibits, including a standing replica of the Montréal Canadiens dressing room and interactive games that allow guests to step into the shoes of their favorite sportscaster or hockey player.

The upper level of the museum provides an elegant and sophisticated environment to socialize, as well as the once-in-a-lifetime opportunity to grab a photo with hockey's most renowned trophies — including the legendary Stanley Cup!

Please remember to wear your meeting badges or bring your purchased individual ticket.

## Interactive Livestreaming at the Spring Meeting

Participants will join meeting attendees at a select few of the Spring Meeting sessions virtually. Viewers will participate live in a few of sessions remotely from around the globe. Participants attending virtually will have the opportunity to interact with other virtual attendees as well as pose questions to the speakers during the sessions.

## Live Streaming Sessions

**Tuesday, May 23, 6:30 a.m. – 7:30 a.m. (OPTIONAL FOR ON-SITE ATTENDEES)**

C-6: Current Applications of Microinsurance Innovations

**Tuesday, May 23, 8:00 a.m. – 9:30 a.m.**

General Session 3: Economic Capital Modeling — Is It Impacting Business Decisions?

**Tuesday, May 23, 10:00 a.m. – 11:15 a.m.**

C-2: Addressing Unconscious Bias in the Workplace

**Tuesday, May 23, 1:15 p.m. – 2:30 p.m.**

C-24: Overview and Practical Applications of Machine Learning Methods in Pricing

**Tuesday, May 23, 2:45 p.m. – 4:00 p.m. (OPTIONAL FOR ON-SITE ATTENDEES)**

C-5: Climate Change Risks and Opportunities for Actuaries

## Learning Lounges

Hinging on the idea that social interaction that makes learning stick, the planning committee is arranging two facilitated hour-long events that will take place at the below times and dates. If you like roundtable discussions, consider these lounges as rooms filled with roundtables where each table will have a representative who will report on the discussions. This is an opportunity to provide innovative platforms for our attendees to learn, discuss and debate issues — all while networking and earning continuing education credits.

**Monday, May 22, 3:00 p.m. – 4:15 p.m.**

Learning Lounge 1 (LL-1) – Enterprise Risk Management (Facilitators: Dave Ingram, Bob Wolf)

**Wednesday, May 24, 8:00 a.m. – 9:15 a.m.**

Learning Lounge 2 (LL-2) – Predictive Analytics (Facilitators: Steve Armstrong, Bob Wolf)

## Start a Research Working Party to Address a Particular Work Challenge

Generated and undertaken by CAS members themselves, working parties are collective volunteer groups with the specific goal of producing a research product, such as a written paper or demonstration software within one to two years. They should produce cohesive, accessible material in a consistent format through the collective, controlled nature of the process. Working parties should help the CAS effectively address research problems and harness the creative energy of individual researchers. The research problem could be a particular area of practical actuarial work that could be more effective. The working party usually consists of six to seven volunteers who will strive to complete their research in one year. Those who have an idea are not necessarily required to chair the working party. Working parties are open to all interested researchers, and both CAS members and nonmembers are invited to participate. They have proven to be effective research mechanisms for GIRO, the general insurance research organization of the Institute and Faculty of Actuaries (U.K.).

As a member considers a new working party, these questions should be addressed:

- What issue or challenge is this research idea trying to address?
- Who will benefit from this research (be as specific as possible)?
- What do you see as the finished product or deliverable of this research?
- What is the timeline of this research?
- Are you aware of any previous work being done in this area?

A working party idea must be approved by the CAS Vice President – Research & Development before additional volunteers apart from those who are initially interested in the work are recruited and the work begun.

Do you have an idea for a working party that you'd like your peers at the CAS Spring Meeting to sign up for? Stop by the CAS Booth in by the registration desk to add your idea to the list.

## Sessions by Theme

Each concurrent session is grouped by a primary theme, although sessions may cover multiple themes. See session titles below (p. 48)

### Corresponding Concurrent Sessions and Times

Session Themes	Monday, 1:15 – 2:30	Monday, 3:00 – 4:15	Tuesday, 10:00 – 11:15	Tuesday, 1:15 – 2:30	Wednesday, 8:00 – 9:15
Business Skills		C-26	C-16	C-16R	C-8
CAS		C-29			
Catastrophes			C-3	C-9	
Cyber		C-7			
Emerging Issues	C-18	C-27	C-13, C-28	C-17, C-30	C-1
ERM	C-10	LL-1			
Financial					C-5R
International	C-10		C-6R	C-23	
Predictive Modeling	C-19, C-25, P-1	C-12, C-20	C-14, C-15	C-4, C-24	C-14R, LL-2
Professionalism	C-22	C-11	C-2	C-31	C-22R
Regulatory	C-21			C-23	





# BUCKLE UP. CHANGE IS COMING.

## IT TAKES VISION

It's no secret that autonomous vehicles are poised to revolutionize the auto industry. But what about insurance? As risk experts, we have our view. But we decided to reach out to leaders in technology, law and insurance to learn even more. To hear what they had to say, visit [Milliman.com/drive](http://Milliman.com/drive)



# SPONSORS & ADVERTISERS

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	<p><b>Verisk/ISO</b> Tuesday Evening Dinner Sponsor</p>

# FEATURED SPEAKER

## F-1: Featured Speaker, Eric Garland

**May 22, 2017, 9:45 a.m. – 10:45 a.m.**

Eric Garland, founder and director of Competitive Futures, a competitive analysis firm that provides insight and expert guidance to corporate clients and government agencies, will speak on “The Future of Risk: Evolving Foresight for a World in Transition.”

He will give forecasts about the future of risk — how deeply interconnected world systems are increasing complexity and decreasing the ability to predict sudden shocks. Exploring his work in decision sciences, he will detail how actuaries can improve their understanding of emerging fields such as cognitive bias and behavioral economics to reduce risk and elucidate opportunities for their clients in the years to come.

Garland is trusted for his unique insight and analysis on economic trends, geopolitics and society. He personally consults executives on market growth strategy, leads transformative educational sessions for organizations and specializes in keynotes that spark conversations.

A brief list of notable clients includes Energizer, Coca-Cola, Siemens, the country of France, the City of Charlotte, the state of South Dakota and the Principality of Monaco.

In addition to public speaking and guest broadcast appearances on BBC, AJAM, The History Channel and Politico, Garland has authored three books. His writingwriter has gone viral several times, and Garland has been featured in the *Wall St. Journal*, *The Atlantic* and *Business Insider*, among others.



# GENERAL AND CONCURRENT SESSIONS

## 2017 CAS Spring Meeting Rating System



No prior knowledge of the subject matter is assumed.  
Little or no technical content.



General knowledge of the subject matter is assumed.  
Moderate technical content.



Working knowledge of the subject matter is assumed.  
Moderate to highly technical content.

More detail about the sessions and speakers is found on the CAS Meeting app. All sessions will be recorded (simultaneously audio, slides), except where indicated.

**MONDAY, MAY 22, 2017**

**9:45 a.m. – 10:45 a.m.**



### F-1: The Future of Risk: Evolving Foresight for a World in Transition

#### Grand Ballroom West & Centre

*This session will be webcast live.*

Eric Garland is the founder and director of Competitive Futures, a competitive analysis firm providing insight and expert guidance to corporate clients and government agencies. Forecasting the future of risk, Garland's talk will discuss how deeply interconnected world systems are increasing in complexity and decreasing the ability to predict sudden shocks. Exploring his work in decision sciences, Garland will detail how actuaries can improve their understanding of emerging fields such as cognitive bias and behavioral economics to reduce risk and elucidate opportunities for their clients in the years to come.

Moderator: Nancy Braithwaite, President, CAS

Panelist: Eric Garland, Executive Director, Competitive Futures

# GENERAL AND CONCURRENT SESSIONS

**11:00 a.m. - 12:15 p.m.**

## **General Session 1: TED Talks — Technology Developments Affecting Insurance**

### **Grand Ballroom West & Centre**

*This session will be webcast live.*

This session will feature three short discussions on industry issues in the format of TED talks. TED talks are designed to be short enough to hold people's attention but precise enough to be taken seriously. We have assembled a group of industry pioneers who will be talking about their experiences. Three topics planned for this session will be as follows:

1. Going from an idea/concept to raising capital to ultimately launching a viable product in the insurance space.
2. Understanding blockchain — some say it's as revolutionary as the internet in the way it may change the way we do business.
3. Discussing the latest trends in our sharing economy and the impact on risk management and insurance, using examples such as Uber.

#### Learning Objectives:

- Consider special pricing and reserving techniques for technological advances affecting Insurance and the actuarial profession.
- Explore ways to incorporate technological advances in everyday analyses.
- Use innovation to launch new ideas in the Insurance marketplace.

Moderator/Panelist: Ben Stinson, U.S. Head of Business Development, BrovadaOne, Willis Towers Watson

Panelists: Chad Nitschke, CEO, Bunker  
Magdalena Ramada Sarasola, Senior Economist, Willis Towers Watson  
David Cummings, Senior Vice President, ISO

# GENERAL AND CONCURRENT SESSIONS

1:15 p.m. - 2:30 p.m.



## C-10: Estimating VaR Deep in the Tail: A Practical Method and Tales from Implementation for Solvency II in Mexico

### Civic Ballroom North

The maximum likelihood estimation (MLE) method works well for estimating the parameters of a loss distribution. In some lines of insurance, however, we find that the empirical loss distribution has a much fatter tail than is indicated by the MLE method. A solution from extreme value theory can be useful here. We fit the losses to a distribution and then select a different distribution for the tail. The proposed method is useful for (1) identifying where the tail begins and (2) selecting parameters for the tail. The speakers will present a hands-on explanation of this method, along with the practical considerations for working with regulators when implementing this method in a pricing or reserving model.

Learning Objectives:

- Use diagnostics to determine where the tail of the distribution begins.
- Add to your toolbox a method of selecting parameters for the tail of a distribution.
- Submit a model to a regulator with a better understanding of issues to consider before hand.

Moderator: Martin King, Director of Property and Casualty Actuarial Services, Kaiser Permanente

Panelists: Alejandro Ortega, Educator  
Jose Borrego, Director of Consulting, Lockton  
Maria Karina Suarez Rodriguez, Chief Finance Actuary, AIG



## C-18: An Introduction to InsurTech

### Dominion North

In this session Adam Troyer from Aon Benfield will give a general overview of the InsurTech space where he'll discuss a few of the companies and what problem their business model is trying to solve. Following Benfield will be Chad Nitschke, the CEO and co-founder of Bunker, an InsurTech startup. Nitschke will discuss what his company does, what their goals are, how they got venture capital funds to invest and how he sees his company fitting in with incumbent insurers.

Learning Objectives:

- Understand what InsurTech is as well as some of the problems InsurTech startups are attempting to solve.
- Be familiar with Bunker, an InsurTech startup.

Moderator/Panelist: Adam Troyer, Managing Director, Aon Benfield

Panelist: Chad Nitschke, CEO, Bunker

# GENERAL AND CONCURRENT SESSIONS



## C-19: Introduction to R, Part One

### Provincial Ballroom

Get ready to immerse yourself in a double concurrent session on the single most important technological advance for actuaries since the invention of the pocket calculator.

In this double concurrent session:

- You'll know how to install R, R Studio and any of the many thousands of R packages.
- No longer will you be intimidated by the phrase “familiarity with R is assumed” that you see in descriptions for fancy-schmancy predictive modeling workshops.
- You'll be able to fetch your data, visualize your data, model your data, save your data.

Requirements for this workshop:

- A functioning laptop (PC or Mac)
- Installation of R and R Studio in advance of the workshop (instructions and support for this will be provided)
- Patience, enthusiasm and a sense of humor

NEED TO ATTEND PART TWO.

Learning Objectives:

- Install R, R Studio and any of the many thousands of R packages.
- Fetch and visualize data in R.
- Model data in R and save the results

Moderator/Panelist: Rajesh Sahasrabuddhe, Partner, Oliver Wyman Actuarial Consulting

Panelist: Alexandra Taggart, Actuarial Analyst, Oliver Wyman Actuarial Consulting



# GENERAL AND CONCURRENT SESSIONS



## C-21: Is Affordability the Next Big Issue for Automobile Insurers?

### City Hall Room

Affordability has long had the attention of policymakers throughout both the U.S. and Canada, and indeed, a handful of jurisdictions have implemented affordable rating plans. Now, the Federal Insurance Office (FIO) has proposed an affordability index as a policy tool for monitoring the extent to which affordable automobile insurance is, or is not, accessible in at-risk demographic groups.

Speaker Kathryn Walker will share her analysis of the FIO's Affordability Index and give her insights into the potential implications for insurers, if the Affordability Index became a national standard for rate setting. She will assess the current progress on the research and evaluation of the FIO Affordability Index, discuss the many organizations currently opining on affordability, and present initial results of the application of the Affordability Index.

Speaker Camille Minogue will share her experiences working in a jurisdiction committed to “fair and affordable rates for all.” She will describe how the actuary's work in such a jurisdiction must necessarily change, but in meaningful way that assists policymakers (e.g., politicians, regulators) in achieving their public policy objectives.

Learning Objectives:

- Session participants will be able to identify the multifarious stakeholders and stakeholder concerns within the use of an affordability index to evaluate industry rates.
- Session participants will be able to describe the important value that actuaries bring to the issue of affordability within the ratemaking process.

Moderator: Beverly Phillips, Actuary, Pinnacle Actuarial Resources, Inc.

Speakers: Kathryn Walker, Consulting Actuary, Pinnacle Actuarial Resources, Inc.  
Camille Minogue, Retired Actuary, Law Offices of Dan R. Young



## C-22: Lights! Camera! Professionalism!

### Dominion South

*This session will not be recorded.*

*This session will repeat on Wednesday at 8:00 a.m.*

Come enjoy the acting of some fine fellow actuaries who will take on several skits involving professional dilemmas. Updated for 2017, the skits will lead to some lively and educational audience discussions. You will walk away from this session with a better understanding of the ASOPs, codes of conduct and how to apply them when you face your own professional ethical dilemmas. This session may provide attendees with Professionalism Continuing Education credits.

Learning Objectives:

- Apply the Code of Professional Conduct Precepts, Actuarial Standards of Practice (ASOPs) and the Statement of Principles to actuarial work.
- Recognize actuarial gray areas and respond in a manner that upholds the reputation of the actuarial profession.
- Utilize resources available to help actuaries abide by the standards.

Speakers: Patricia Teufel, Adjunct Professor, University of Connecticut  
Michael Chen, Consulting Actuary, Pinnacle Actuarial Resources, Inc.  
Kimberly Guerriero, Consulting Actuary, Milliman, Inc.

# GENERAL AND CONCURRENT SESSIONS



## C-25: The Predictive Modeling Context With Minimum Bias, GLMs and Credibility

### Civic Ballroom South

Traditional statistical model building involves testing the model assumptions to validate the appropriate model is being applied to the data. For this process detailed model specifications are needed and hypotheses are tested. Instead, the presenters propose predictive performance testing where only the predictive framework is needed. A model is valid as long as it performs well at predicting outcomes for data not used to fit its parameters.

An empirical case study will be presented comparing the relative predictive performance of a multiplicative minimum bias model and a generalized linear model (GLM) without specifically testing the validity of any of the model assumptions, such as likelihoods, independence assumptions, etc. Comparison of models is also made when credibility is incorporated

Learning Objectives:

- Provide examples and describe the difference between the modern context of predictive modeling versus the traditional modeling context. Specifically, be able to list some of the advantages of seeking optimal predictive performance rather than validating model assumptions.
- Summarize the argument for sometimes using the multiplicative minimum bias approach instead of a full-blown modern generalized linear model (GLM) in the predictive modeling context.
- Explain in general how credibility can be incorporated into either multiplicative minimum bias or GLMs. Specifically, be able to give a brief description of the relative simplicity of incorporating credibility into the multiplicative minimum bias approach in contrast with the complexity of incorporating credibility into GLMs.

Moderator/Panelist: Curtis Gary Dean, Distinguished Professor of Actuarial Science, Ball State University

Panelists: Jonathan Evans, President, Convergent Actuarial Sciences, Inc.  
Christopher Gross, President, Gross Consulting



## P-1: What Actuaries Should Know About Nonparametric Regression With Missing Data

### Simcoe/Dufferin

To predict one variable, called the response, given another variable, called the predictor, nonparametric regression solves this problem without any assumption about the relationship between these two random variables. Traditional data, used in nonparametric regression, is a sample from the two variables; that is, it is a matrix with two complete columns. In practical applications, some observations in that matrix may be missed; what can be done in this case is the subject of this paper. Three possible scenarios are considered. First, if the probability of missing an observation depends on its value, then no consistent estimation is possible. Second, if all predictors are available and the probability of missing the response depends on value of the predictor, then a nonparametric regression, based on complete cases, is optimal. Third, if all responses are available and the probability of missing the predictor depends on value of the response, then a special estimation procedure, based on all available observations, is optimal. Examples will illustrate the results and possible extensions will be discussed.

Learning Objectives:

- Identify emerging risks in North America's agricultural sector and the potential impacts on the Canadian and U.S. economies.
- Apply a credibility framework to develop actuarially sound rates for an emerging risk, using Livestock Mortality insurance as an example.
- Identify the types of missing data and how to deal with each using nonparametric regression.

Speaker: Sam Efromovich, Professor, University of Texas at Dallas

# GENERAL AND CONCURRENT SESSIONS

**3:00 p.m. - 4:15 p.m.**



## C-7: Data and Cybersecurity: Legal and Regulatory Developments

### **Dominion South**

This session will consider the issues associated with recent developments in regulation of cybersecurity matters and the cyber insurance marketplace, as well as new cyber-related issues looming on the horizon. The proposed cybersecurity model law of the National Association of Insurance Commissioners (NAIC) will be discussed, including a deep-dive into how its provisions would impact the insurance industry and some of the criticisms of the NAIC's approach. Other activity at the state level will also be discussed, including some of the most recent guidance developed by insurance departments. Tips for working with regulators to avoid compliance pitfalls will also be shared. Lastly, the possibility of federal regulation will be considered, with an analysis of the pros and cons of such a scenario.

Learning Objectives:

- Evaluate companies' cybersecurity compliance and take steps to remedy any shortfalls.
- Review companies' cyber liability insurance policies and identify potential coverage gaps or other issues to address.
- Take steps to prepare companies for data breaches, including the development of breach prevention and post-breach response protocols.

Moderator/Panelist: Fred Karlinsky, Shareholder & Co-Chair, Insurance Regulatory and Transactions Practice, Greenberg Traurig, P.A.

Panelists: Lori Nugent, Shareholder, Greenberg Traurig, P.A.  
Robert Parisi, Managing Director, Marsh FINPRO



## C-11: Focus on New Fellows: Volunteering, Millennials and the Growing CAS

### **City Hall Room**

Attention, New Fellows! Now that you're finished with exams, do you know services are available to you? Do you wish there were additional services available?

New members make up more than one-third of the CAS membership and will guide CAS success into the future. In this interactive session, the CAS New Members Committee will discuss their role in the CAS as millennials and volunteers, and ask what CAS membership means to you.

New Fellows are encouraged to attend to share their thoughts and ideas on the future of the CAS.

Learning Objective:

- Utilize CAS resources and staff and be prepared to guide the future of the CAS through the millennium.

Moderator/Panelist: Matt Caruso, Membership & Volunteer Manager, CAS

Panelists: Kathryn Walker, Consulting Actuary, Pinnacle Actuarial Resources, Inc.  
Kimberly Guerriero, Consulting Actuary, Milliman, Inc.  
Pammi Yeung, Assistant Actuary, Liberty Mutual Insurance

# GENERAL AND CONCURRENT SESSIONS



## C-12: GLM: A Deep Dive of Frequency-Severity vs. Pure Premium Approach

### Civic Ballroom South

Because Tweedie distribution is getting more popular for the GLM-based predictive modeling practice, the comparison on frequency-severity separated modeling approach vs. pure premium modeling approach is always a hot topic in many P&C pricing and underwriting predictive modeling projects.

It is not only a technical question on estimation accuracy, it data availability, product management and various implementation considerations.

In this session, we will discuss pros and cons of the two modeling approaches under different modeling scenarios (e.g., long-tail vs. short-tail, high volume vs. low volume). We will specifically describe major challenges of using each of the two approaches and showcase studies for each approach. We will also provide a guideline from the class plan development and implementation perspective about how to make a judgment.

Learning Objectives:

- Assess and evaluate the pros and cons of the frequency-severity vs. pure premium approaches.
- Develop a process to judge which approach to use from a technical perspective.
- Develop a process to judge which approach to use from a class plan development and implementation perspective.

Moderator: Greg Gilbert, Opta Information Intelligence

Panelists: John (Jun) Zhou, Project Manager, Achmea  
Jun Yan, Specialist Leader, Deloitte Consulting LLP



## C-20: Introduction to R, Part Two

### Provincial Ballroom

Get ready to immerse yourself in a double concurrent session on the single most important technological advance for actuaries since the invention of the pocket calculator. No longer will you be intimidated by the phrase “familiarity with R is assumed” seen in descriptions for fancy-schmancy predictive modeling workshops.

In this double concurrent session:, you will learn how to install R, R Studio and any of the many thousands of R packages, and you’ll be able to capture, visualize, model and save your data.

Requirements for this workshop are:

- A functioning laptop (PC or Mac).
- Installation of R and R Studio in advance of the workshop (instructions and support for this will be provided).
- Patience, enthusiasm and a sense of humor.

Moderator/Panelist: Rajesh Sahasrabudde, Partner, Oliver Wyman Actuarial Consulting

Panelist: Alexandra Taggart, Actuarial Analyst, Oliver Wyman Actuarial Consulting

# GENERAL AND CONCURRENT SESSIONS



## C-26: Presenting to Non-Actuaries

### Dominion North

This interactive session will use live polling and a Q&A session to discuss real-life examples in which communication and presentation style were integral to the outcome of a discussion. Different audiences and generations require various communication strategies (e.g., consultants vs. company actuaries vs. academic setting vs. student/employer interactions). Effective presentation skills will be examined in the context of the presentation's specific audience, goals and motivations. Various scenarios and points of view from the panelists and the audience will be incorporated. Resources for self-improvement of communication and presentation skills will be suggested. No prior knowledge is required.

Learning Objectives:

- Differentiate between the types of discussions on different topics, depending on the target audience.
- Create effective presentations based on the audience and the key takeaways that the presenter wishes to impart.
- Reflect upon prior experiences and recognize how to improve the outcome of future presentations.

Moderator/Panelist: Aaron Hillebrandt, Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Panelists: David Prevo, Senior Actuarial Analyst, Country Financial  
Jeffrey Zheng, Assistant Teaching Professor, University of Notre Dame  
Stefan Peterson, Manager, Deloitte Consulting  
Somil Jain, Senior Product Manager, Plymouth Rock Assurance New Jersey



## C-27: The Risk Impact of the Internet of Things

### Civic Ballroom North

As more homes, business and wearables are being connected, these Internet of Things (IoT) devices can help carriers better understand the risks they are insuring. IoT devices can also provide services back to insureds beyond merely indemnifying them for losses incurred. These technologies may also present new risks to insurers. This session will focus on the risk impact associated with IoT specifically focused on non-vehicle related technologies, including smart homes and wearable technologies.

Learning Objectives:

- Evaluate the impact of emerging IoT technologies on risk presented to insurers and their customers.
- Consider how the emergence of IoT devices might impact claims, rating plans and other aspects of insurer operations.

Moderator: Linda Brobeck, Pinnacle Actuarial Resources, Inc.

Panelists: Peter Rousmaniere, Journalist and Consultant, WorkersCompensation.com  
George Hosfield, Senior Director, Home Insurance Vertical, LexisNexis Risk Solutions

# GENERAL AND CONCURRENT SESSIONS



## C-29: An Update from Admissions

**Simcoe / Dufferin**

*This session will not be recorded.*

Topics will include how CAS Admissions is addressing specific suggestions from a candidate working group session; incorporating technology into the examination process; restructuring the CAS Admissions Department and related volunteer opportunities; and other priorities for the coming year. Candidates are welcome to attend to interact with the presenters.

Learning Objectives:

- Apply your skills and experience to the CAS Admissions process.
- Incorporate proper technology in the examination process.
- Volunteer for restructured opportunities in the Admissions area.

Moderator/Panelist: Michelle Iarkowski, Manager, Deloitte Consulting, LLP

Panelist: Steven Armstrong, Vice President – Pricing and Analytics, Allstate

## LL-1: ERM

**Churchill**

Hinging on the idea that social interaction that makes learning stick, the planning committee is arranging two facilitated sessions for Spring Meeting attendees with responsibilities in one or both of these areas. These 75-minute sessions will be led by experienced practitioners in the field who will have attendees discuss and brainstorm solutions to challenges facing the profession in these areas. This will provide a platform for actuaries to discuss issues, learn and network.

Facilitators: Dave Ingram, Senior Vice President, Willis Towers Watson

Bob Wolf, Vice President & Chief Actuary, Stonetrust Insurance



# PROUD OF OUR PEOPLE

Liberty Mutual proudly congratulates our new  
Casualty Actuarial Society Fellows, Associates, and CERA.

## New Fellows

Christine Garvey  
Buu Huynh  
Samantha Ugol

Huan Yvonne Liu  
Michael Mahachi  
Sungho Noh  
Julia Osborn  
Walker Parent  
Derek Shupe  
Justin Teal  
Katherine Unger  
Stanley Wang  
Jonathan Woelfel  
Xin Shirley Xu  
Katheryn Yerry

## New Associates

Jonathan Almagro  
Kyle Benzing  
Eric Brecht  
Danielle Brennan  
Jennifer Dyson  
Kathryn Fagnoli  
Erik Fingar  
Stephen Giusti  
Kevin Goldsmith  
Zhoujie Guo  
Robert Henault  
Caitlin Hendricks  
Nicholas LeClaire  
Ruiqi Li

## New CERA

Parker Koppelman

[libertymutualgroup.com/careers](https://libertymutualgroup.com/careers)

Liberty Mutual Insurance is an equal opportunity employer. We acknowledge, welcome, and accept the differences that each employee brings to the workplace.

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## Congratulations to Travelers' newly credentialed CAS actuaries.

### FCAS

Hao Ding  
Cale Nelson

### ACAS

Kara Anderson  
Colleen Duggan  
Joshua LaPointe  
Katherine Tubbs  
Erin Yetter

Samantha Delperdang  
Mikalai Filon  
Ashley Leonard  
Ashley Wirz  
Kevin Zech

Jacqueline Dufficy  
Neal Kalinsky  
Melissa Pinsonneault  
Nicholas Wood

We are proud of you and your accomplishments!

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# GENERAL AND CONCURRENT SESSIONS

6:30 a.m. – 7:30 a.m.

## OPTIONAL SESSION



### C-6: Current Applications of Microinsurance Innovations

#### Grand Ballroom East

*This session will be livestreamed.*

P&C microinsurance products range from on-demand coverage for personal articles to sensor-based drought coverage in Zimbabwe. In this session, members of the CAS Microinsurance Working Party will discuss why organizations may want to consider microinsurance in their strategies and how actuaries can get involved. Specific areas considered will be market selection, measuring impact, and developing products, as well as understanding micro coverage needs in mature markets.

#### Learning Objectives:

- Apply technological and design innovations from microinsurance to broaden the actuarial skill set and administer exceptional products.
- Quantify business potential in developing markets internationally and domestically and develop strategies to serve coverage needs.
- Address challenges such as basis risk or product unfamiliarity that may arise in developing microinsurance products.

Moderator/Panelist: Jim Weiss, Director, Analytic Solutions, ISO

Panelists: Barbara Chabbaga, Lead Consultant, AB Consultants

Thomas Johansmeyer, AVP, PCS Strategy and Development, ISO

# GENERAL AND CONCURRENT SESSIONS

**8:00 a.m. – 9:30 a.m.**



## General Session 2: The U.S. Election and the Affordable Care Act

### Grand Ballroom West & Centre

After implementing the Affordable Care Act (ACA) in 2010, the U.S. health care system came one step closer to Canada's, a system made up of a group of public health insurance plans covering all legal residents. The ACA has seen its share of growing pains and, in the wake of the new political regime in the U.S., is vulnerable to potential changes and possible repeal.

Speakers will compare and contrast the Canadian and U.S. health care plans, specifically with up-to-date knowledge of the new U.S. administration's plans for ACA and the impacts on insurance availability and affordability — both direct and indirect on the property-casualty sector. This may include a discussion around the pros and cons of private versus public health insurance.

Learning Objectives:

- Discuss the issues the ACA has aimed to solve and preliminarily achieved.
- Identify some intended and unintended consequences of the ACA on the health care and P&C sectors.
- Discuss the current status of potential refinements to the current ACA.

Moderator/Panelist: Keith Palmer, Director, Workers Compensation Research Institute

Panelists: John Ruser, President and CEO, Workers Compensation Research Institute

Gregory Chrin, Senior Manager, Deloitte Consulting, LLP

Laura Cali Robison, Insurance Commissioner & Chief Actuary, Oregon Division of Financial Regulation



## General Session 3: Economic Capital Modeling — Is it Impacting Business Decisions?

### Grand Ballroom East

*This session will be livestreamed.*

Actuaries have been wrestling with the concept of economic capital modeling, capital adequacy and capital allocation for over 100 years. A significant evolution has been in play over that time in clarifying the purpose, methods and usage of the various techniques. Arguably, however, no clear winning technique has emerged — and that may be the point. There may not need to be one clear winning technique. Are economic capital models being built primarily to comply with regulations (i.e., ORSA and Solvency II)? Are the resultant models actually being used in business decisions?

The panelists will discuss the above inquiries, highlighting best-practices that have emerged and lessons from various successful practical implementations as well as the challenges that consider executive level and regulatory acceptance.

Learning Objectives:

- Utilize a global perspective on how the evolution of economic capital modeling is shaping business decisions.
- Acquire industry viewpoints on economic capital modeling and its use in compliance vs internal business use.
- Gain industry perspective on key successes of practical usage in business decisions

Moderator/Panelist: Kevin Madigan, Director, Willis Towers Watson

Panelists: Kendra Felisky, Board Member, CAS

David Ingram, EVP, Willis Towers Watson

# GENERAL AND CONCURRENT SESSIONS

10:00 a.m. – 11:15 a.m.



## C-2: Addressing Unconscious Bias in the Workplace

### Grand Ballroom East

*This session will be livestreamed.*

Participants in this session will learn about the biological origin of bias. We will cover the four basic types of unconscious biases that affect us and the way that we interact with others. The session will include examples that apply to actuaries in the work force.

Learning Objectives:

- Create a more inclusive environment in at work.
- Avoid common traps in everyday interactions with colleagues and clients where such biases can lead to bad decision-making.

Moderator/Panelist: Alejandro Ortega, Vice Chair, CAS Diversity Committee

Panelists: Kezia Charles, Consulting Actuary, Willis Towers Watson  
Dale Woods, Senior Consultant, Willis Towers Watson



## C-3: Casualty: You're Doing it Wrong

### Civic Ballroom North

Casualty catastrophe has traditionally been addressed through the risk management technique of risk avoidance, resulting in risk exclusions and casualty insurance products that offer limited coverage. This session will focus on new technologies and innovative modeling methods that allow for the identification, prioritization and management of casualty catastrophe risk. The panelists will discuss how these new techniques are being used to inform business decisions in areas such as underwriting and pricing. The session will examine the growth potential of the casualty insurance market that can be achieved through the use of nontraditional techniques in the management of casualty accumulation risk.

Learning Objectives:

- Manage and steer the casualty accumulation risk within your portfolio.
- Identify potential business applications and uses of casualty catastrophe tools.
- Apply innovative modeling techniques to facilitate growth in the casualty insurance market.

Moderator/Panelist: Nicole Van Allen, Manager, Client Services & Actuary, Praedicat, Inc.

Panelists: Alison Nisonger, Swiss Re  
Andrea Boudreau, Manager of Modeling, Praedicat, Inc.  
Dana Embree, Portfolio Steering & Pricing Actuary, Allianz Global Corporated Specialty SE



## C-6R: Current Applications of Microinsurance Innovations

### Dominion South

*This is a repeat session. For descripton, please go to page 34.*



# GENERAL AND CONCURRENT SESSIONS



## C-13: How Sustainability Practices Impact P&C Insurance

### City Hall Room

Starting with an overview of the pillars and principles of a general sustainability framework, this session will introduce the potential implications of sustainable practices on P&C insurance operations (investments, underwriting, product design, claim adjudication and reporting). In line with United Nations Principles for Sustainable Insurance, this session will also explore sustainability considerations to take into account while completing actuarial work in reserving, pricing or risk management.

#### Learning Objectives:

- Recognize some possible gaps and opportunities arising from the development of a sustainable framework for a P&C insurer. We will provide handouts that will help visualize sustainable frameworks and identify current sustainable practices and gaps.
- Identify possible factors related to sustainable insurance that may affect the approaches and assumptions underlying the actuarial work and its reporting.
- Participate in a sustainability assessment and contribute to the development of sustainable strategies for a P&C insurer.

Moderator/Panelist: Houston Cheng, Consulting Actuary, KPMG LLP

Panelists: Anh Tu Le, Consulting Actuary, KPMG LLP  
Arnaud Van Dijk, Senior Manager, Global Sustainability Services, KPMG LLP  
Wesley Griffiths, 2VP and Actuary, The Travelers Companies, Inc.



## C-14: How to Effectively Use New and External Data

### Civic Ballroom South

*This session will repeat on Wednesday at 8:00 a.m.*

The first speaker in this session will highlight the need to look at external data sources and how to connect to them. He will identify companies using external data sources to solve various business problems and will discuss using artificial intelligence or machine learning to digest unstructured data into structured data sets.

The second speaker will talk about what to consider when looking at external data, such as the strategic view of the company, management support for long-term projects, areas that can benefit from new data and business and regulatory constraints. He will also compare and contrast the capabilities of data scientists and actuaries and discuss how they can work together to achieve the company goals.

#### Learning Objectives:

- Identify external data sources and connect to them.
- Structure external data sets.

Moderator: Benoit Carrier, Managing Director, Aon Benfield

Panelists: Gregory Gilbert, Chief Data Scientist, Opta Information Intelligence  
Maxime Lafleur-Forcier, Senior Manager R&D, TD Insurance

# GENERAL AND CONCURRENT SESSIONS



## C-15: Improving Actuarial Reserve Analysis Through Claim-Level Predictive Analytics

### Dominion North

Aggregate reserving techniques such as triangle analysis dominate current actuarial practice. However, there is much to be gained by analyzing the detail that is otherwise lost when triangles are created. Advances in predictive modeling are allowing companies to detect patterns in data that were not able to be detected in the past. Session panelists will illustrate some of the approaches and the benefits of using predictive modeling techniques in actuarial reserving. This work ranges from adding additional insight to traditional reserving techniques by analyzing changes in case reserve adequacy or assisting with reserve segmentation, to a full reserve development model based on individual claim development and emergence behavior over the life of a claim.

Learning Objectives:

- Evaluate the use of predictive modeling techniques for ad hoc and other traditional analyses, such as case reserve adequacy.
- Construct a claim life cycle model to build a triangle-free approach to actuarial reserving.
- Build objective case reserving algorithms to provide an alternative triangle with useful properties to the actuary.

Moderator: Kathryn Walker, Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Panelists: Christopher Gross, President, Gross Consulting  
Claudine Modlin, Director, Willis Towers Watson



## C-16: Influential Public Speaking: How to Be A More Effective Technical Communicator

### Provincial Ballroom

*This session will repeat on Tuesday at 1:15 p.m.*

More than ever, property-casualty actuaries need to speak with clarity and confidence. Communication is the top nonquantitative skill that actuaries need to succeed, according to a recent Casualty Actuarial Society survey. As former Chrysler Chairman Lee Iacocca said, “You can have brilliant ideas, but if you can’t get them across, your ideas won’t get you anywhere.”

Participants will discover how to communicate technical content more effectively so that diverse audiences will understand and pay attention. This engaging and interactive session will assist junior actuaries who want proven public speaking tactics as well as veterans who want a practical refresher on being a more engaging speaker.

Learning Objectives:

- Identify your natural speaking strengths and weaknesses, and describe how to engage different stakeholders.
- Learn how to overcome public speaking nervousness with simple but effective mental and physical exercises.
- Describe how to effectively structure your presentation and articulately answer impromptu questions.

Speaker: Ron Tsang, Author and Speaker, R.H. Tsang Consulting

# GENERAL AND CONCURRENT SESSIONS



## C-28: Tax Changes and the Impact on the Insurance Market

### Churchill Room

It's on the minds of most everyone in the investing and business communities — lower taxes! The president and congressional leadership have identified tax reform as a priority. Lower is better is a great conclusion; however, it is not that simple. This session will explore the implications of tax reform on the property-casualty insurance business with respects to investing, reinsurance, liquidity, reserving and competition.

Learning Objectives:

- Adjust rate filings to better reflect the new tax laws.
- Adjust a company's investment portfolio to better reflect the new tax laws.
- Determine alternate reinsurance strategies that better reflect the new tax laws.

Moderator: Joshua Fishman, Senior Vice President, Willis Towers Watson

Panelists: Kenneth Kruger, Executive Vice President, Willis Towers Watson  
Elizabeth Petrie, Manager, Washington National Tax, KPMG, LLP

**1:15 p.m. – 2:30 p.m.**



## C-4: Claims Level Analytics

### Dominion North

The natural progression of technology has made it possible to accumulate very granular data about policies, claims, exposures and other related data. At the moment, actuarial literature regarding how to analyze such data and integrate the results into insurers' processes is quite sparse. As a result, P&C actuaries are insufficiently prepared to take advantage of this opportunity or even to support the assumption that investment in technology, software and research is justified.

The CAS Claims Level Analytics Working Party has been charged with investigating existing actuarial literature regarding claims level analytics and the tools and methods necessary for analyzing claim level data.

In this session, we will present the working party's findings, including a discussion of the benefits and challenges of using claim level analytics for claims departments, pricing, reserving, ERM and reinsurance. We will also present a variety of claims level models and discuss how those models can be integrated into insurers' processes, as well as discuss a unified model that could underlie both pricing and reserving and provide useful inputs for claim departments.

Learning Objectives:

- Work with more granular data.
- Interact with multiple models, each of which is potentially able to be integrated with their current processes.
- Identify how claim level analytics can be integrated into both pricing and reserving simultaneously, using a unified model.

Moderator/Panelist: Michael Henk, Consulting Actuary, Milliman, Inc.

Panelists: Christopher Gross, President, Gross Consulting  
Ronald Lettofsky, Senior Actuarial Manager, Claims Analytics, Allianz Global Corporate & Specialty SE

# GENERAL AND CONCURRENT SESSIONS



## C-9: Declaring and Estimating Industry Catastrophes

### Churchill Room

Session panelists will first address the process of declaring an industry catastrophe and estimating industry ultimate losses for these declared catastrophes. The speakers will then share an approach to setting reserves for a catastrophe event.

Learning Objectives:

- Establish insurance company reserves.
- Identify potential catastrophe exposures earlier in the reserving process.

Panelists: Shantelle Thomas, Vice President, Allstate Insurance Company  
Thomas Johansmeyer, AVP, PCS Strategy and Development, ISO



## C-16R: Influential Public Speaking: How to Be A More Effective Technical Communicator

### Provincial Ballroom

*This is a repeat session. See description on page 38.*



## C-17: Insurance and the Rise of Drones

### Dominion South

This session approaches the emerging topic of drone use from technical, operational and insurance perspectives, and participants will learn about the past, present, potential future uses of drones; drone accidents; . U.S. drone laws and regulations; potential legal issues arising from drone operations; and drone insurance underwriting and coverage issues.

The audience will come away with a well-rounded understanding of drones and insurance that will allow them to take their next steps in using and insuring drones.

Learning Objectives:

- Better underwrite the drone exposure.
- Recognize legal issues arising from drone operation.
- Properly use a drone.

Moderator: David Snow, Executive Vice President, Swiss Re

Panelists: Anthony Mormino, Senior Legal Counsel, Swiss Re  
Richard Wlezien, Professor and Chair of Aerospace Engineering, Iowa State University

# GENERAL AND CONCURRENT SESSIONS



## C-23: Ontario Auto Reform: A Review of the Impact on Changes Occurring in the past 10 Years

### Civic Ballroom North

The effects on Ontario Auto Reform for the 2015 and 2016 changes are the subjects of this session. Currently, Ontario personal auto insurance contribute about 20 percent of premium to the overall Canadian P&C market. As such, insurers and regulators are keenly aware of the profitability in this market. Ontario drivers are paying the highest premium in Canada, which averages about five percent of disposable income. There have been a series of reforms in the past 10 years and there is an expectation for a fundamental change in 2018, which aims to reduce the premium by more than 25 percent.

Speakers: Todd Orrett, RSA Canada  
Robert Anderson, Actuarial Manager, The Hertz Corporation



## C-24: Overview and Practical Application of Machine Learning Methods in Pricing

### Grand Ballroom East

*This session will be webcast live.*

The term “machine learning” covers a range of methods in pricing and other insurance applications that can be powerful and have very practical benefits. Such methods can aid in further improving statistical modeling (e.g., GLM) results or more broadly bring valuable insights to complex problems. There can also be a number of practical challenges in using these methods effectively. In this session, we will review a range of commonly used methods and show different ways that they are being applied in insurance. The session will focus on the high-level mechanics of each method and the benefits/challenges of their application, as opposed to the underlying technical details.

Learning Objectives:

- Utilize some common machine-learning methods.
- Apply these methods to improve GLM results in the field of insurance pricing.
- Make informed decisions on which methods pair well with what type of application.

Moderator/Panelist: Claudine Modlin, Director, Willis Towers Watson

Panelists: Duncan Anderson, Managing Director, Willis Towers Watson  
Mark Richards, Director: Data, Discovery & Decision Science; Personal Lines, Allstate Insurance Company

# GENERAL AND CONCURRENT SESSIONS



## C-30: Wellness Data: The Next UBI?

### City Hall Room

Sleeping on the job has never been a fast track to success; but sleeping on the way to the job may lead to an early and unscheduled retirement. Research found that more than one-in-five fatal car accidents in the United States involves a drowsy driver.

Property-casualty insurers have long offered discounts to policyholders who attend defensive-driving courses or submit to telemetric examination of their driving habits with usage-based insurance (UBI) devices. Unfortunately, those approaches achieve only limited success because they focus on behaviors surrounding the insured asset and not on a policyholder's larger decisions about wellness. A more effective approach might address how to minimize underlying risk factors that cause or contribute to P&C losses.

This session will bring various perspectives on the relationship between "wellness data" and P&C risk, and it will illustrate how P&C insurers may take a nod from life insurers and apply modeling to new data sources such as wearables, which could help improve underwriting and marketing.

Learning Objectives:

- Identify some of the challenges and opportunities in using wellness data.
- Discover specific correlations that have been found when applying wellness data to traditional P&C insurance areas (auto, etc.).

Moderator/Panelist: Lin Xing, Lead Analytic Scientist, ISO

Panelist: Marc Paquin, Director, Partnerships & Business Development, Carré Technologies (Hexoskin)



## C-31: Who Wants To Be An Actuary?

### Civic Ballroom South

Come refresh your knowledge of actuarial professionalism in this interactive session! This trivia game will cover a number of topics including a review of the code of conduct and ASOPs, which can help you determine what you know and what you might want to review. Who said professionalism can't be fun? This session may provide attendees with Professionalism Continuing Education credits.

Learning Objectives:

- Apply the Code of Professional Conduct Precepts, Actuarial Standards of Practice (ASOPs), and the Statement of Principles to actuarial work.
- Review the proper actuarial documents.
- Utilize resources available to help actuaries abide by the standards.

Speakers: Jeffrey Casaday, Consultant, Toa Reinsurance Company of America

Peter Royek, Senior Vice President & Actuary, Toa Reinsurance Company of America

# GENERAL AND CONCURRENT SESSIONS

**2:45 p.m. - 4:00 p.m.**

## OPTIONAL SESSION



### C-5: Climate Change Risks and Opportunities for Actuaries

#### Grand Ballroom East

*This session will be livestreamed.*

*This session will repeat on Wednesday at 8:00 a.m.*

Explore how climate change risks are measured scientifically and what ways the insurance industry could play a larger role in managing these risks. Presenting in an accessible manner and assuming no scientific background from the audience, panelists will review and discuss some recent results from climate science presented at the Fifth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC AR5). In particular, the panel will discuss both observed, documented changes in the climate as well as projected future changes based on climate models. Next, we will turn our attention to the three potential responses — mitigation, adaptation and geoengineering — and ask which provides the biggest opportunity for the insurance industry. Finally, we will discuss a relatively new financial product known as a weather derivative and how it can be used to manage weather risk. The last part of the session is based on the 2015 Variance paper “Incorporating Spatial Dependence and Climate Change Trends for Measuring Long-Term Temperature Derivative Risk.”

Learning Objectives:

- Identify the primary sources of scientific evidence for global climate change and estimate the pace and scope of this global change.
- Identify risk reduction and climate adaptation initiatives that the insurance industry could lead.
- Create and price simple financial products, known as temperature derivatives, that help manage temperature risk.

Speaker: Robert Erhardt, Assistant Professor of Statistics, Wake Forest University

**3:00 p.m. - 4:00 p.m.**

## ROUNDTABLES

### R-1 — Data Visualization

#### City Hall Room

Want to pick up some tips on how to most effectively display your data? Have some data visualization tips to share? Join our discussion. We will start with a couple of data visualization exercises and then talk about trends and the future of data visualization.

Facilitator: Alison Khan, Actuary, The Travelers Companies, Inc.

### R-2 — Diversity in the Actuarial Profession

#### Civic Ballroom North

The financial case for diversity is strong. However, diversity efforts often fail if there is no culture of inclusion. In this roundtable, you are invited to share your thoughts on what we can do create more inclusive environments in the workplace, and how we can all help to increase the diversity in the profession.

Facilitator: Kezia Charles, Consulting Actuary, Willis Towers Watson

# GENERAL AND CONCURRENT SESSIONS

## R-3 — Internet of Things

### Civic Ballroom South

The Internet of Things (IoT) promises exponentially more data, communicated from devices including everything from home appliances to automobiles to fitness monitors to utility meters. With more data on insured risks there is great excitement about how this data can improve the business of insurance, but also significant trepidation and uncertainty. Participants are encouraged to discuss their plans, desires and concerns regarding the applications of IoT in P&C Insurance.

Facilitator: George Hosfield, Sr. Director, Home Insurance Vertical, LexisNexis Risk Solutions

## R-4 — Microinsurance Working Party

### Dominion South

Join us for a broad discussion on a year of research by the CAS microinsurance working party, and how innovations in micro-insurance are being successfully deployed in developing and mature markets. Barbara, Jim, and Tom will discuss key issues for launching, growing, and operating microinsurance programs – including regulation, distribution, and managing cost-effective operations. We look forward to an interactive discussion, and the ideas brought by each participant.

Facilitators: Barbara Chabbaga, Lead Consultant, AB Consultants  
Thomas Johansmeyer, AVP, PCS Strategy and Development, ISO

## R-5 — The New Associates Perspective: Advancing Your Career through the CAS

### Dominion North

New Associates are invited to participate in this roundtable discussion about the decision to pursue a career as a property casualty actuary. The CAS has implemented an aggressive marketing strategy to attract students and new ACAS input is invaluable. We will discuss how the CAS can position itself as the best career path for aspiring actuaries. In addition, we will discuss how the CAS can improve its connection to candidates sitting for exams and better engage new members in the CAS community. This roundtable is limited to New Associates only.

Facilitator: Matt Caruso, Membership and Volunteer Manager, Casualty Actuarial Society  
Kimberly Guerriero, Consulting Actuary, Milliman, Inc.

## R-6 — Presenting to Non-Actuaries

### Provincial Ballroom North

This roundtable will share and discuss real life situations in which communication & presentation style was integral to the outcome of a discussion. The discussion will focus on different presentation styles used for various types of audiences encountered by consultants, company actuaries, and others, along with resources for self-improvement of presentation skills.

Facilitator: David Prevo, Senior Actuarial Analyst, Country Financial

## R-7 — Sustainability Practices in P&C Insurance

### Provincial Ballroom South

How do we make the leap from “Corporate Social Responsibility” to Sustainability? What is the impact of sustainability on actuarial processes and methodologies? Participants are invited to discuss these topics and the way forward.

Facilitator: Anh Tu Le, Senior Manager, KPMG, LLP



# GENERAL AND CONCURRENT SESSIONS

## R-8 — An Update from Admissions

### Churchill Room

Topics will include how CAS Admissions is addressing restructuring Basic Education to reflect changes from the SOA and IAA ; specific suggestions from our candidate working group survey; incorporating technology into the examination process; related volunteer opportunities; and other priorities for the coming year.

Facilitators: Michelle Iarkowski, Manager, Deloitte Consulting, LLP  
Steven Armstrong, Vice President – Pricing and Analytics, Allstate

WEDNESDAY, MAY 24, 2017

8:00 a.m. – 9:15 a.m.



## C-1: Actuarial Perspectives in the Era of Social Consciousness

### Dominion North

Gun liability bills have been introduced in a number of states over the last few years. The insurance industry has not been engaged in the discussion in more than a superficial level. This session will give attendees the opportunity to look critically at the issues involved in gun liability insurance — the public policy goals and the economics involved as well as how an insurance framework could or could not achieve its desired goals.

The second part of the discussion will focus on the rise of third-party data and its implications for the industry. Competitive pressures compel insurance companies to introduce new pricing factors, though in some cases this may be detrimental to the industry as a whole, and particularly to consumers. The issue will be analyzed in the context of game theory and the Nash equilibrium. A method to measure the overall economic value of pricing factors will also be discussed.

Learning Objectives:

- Empower attendees to think critically about socially important issues and use their expertise and analytical abilities to contribute to the discussion and debate.
- Gain perspective in areas outside the focus of an actuary's traditional day to day work.
- Encourage attendees to challenge accepted norms and view issues through new perspectives.

Moderator/Panelist: Stephanie Rabin, Senior Vice President, Vermont Mutual

Panelists: Joshua Wykle, Actuarial Manager, Vermont Mutual  
Peter Kochenburger, Executive Director, Insurance Law LL.M. Program, University of Connecticut



## C-5R: Climate Change Risks and Opportunities for Actuaries

### Civic Ballroom South

*This is a repeat session. For description, please go to page 43.*

# GENERAL AND CONCURRENT SESSIONS



## C-8: Data Visualization

### Provincial Ballroom

Actuaries are tasked with not only analyzing data but also communicating its intricacies and implications. Are you using the right techniques to visualize data? When will a pie chart suffice and when do we need something more complex? Alison Khan will present the building blocks of good data visualizations. Then Jonathan Poole will focus on examples of how data interaction can lead to faster and greater insights.

Learning Objectives:

- Better communicate results of data you analyze.
- Choose the right techniques to visualize data.
- Recognize more quickly and with greater insights data interactions.

Moderator: David Snow, Executive Vice President, The Travelers Companies, Inc.

Panelists: Alison Khan, Actuary, The Travelers Companies, Inc.  
Jon Poole, Montpelier Re  
Jason Yeung, Senior Manager, Solution Architects, Qlik



## C-14R: How to Effectively Use New and External Data

### Civic Ballroom North

*This is a repeat session. See description on page 37.*



## C-22R: Lights! Camera! Professionalism!

### Dominion South

*This is a repeat session. See description on page 14.*

## LL-2: Predictive Analytics

### Churchill

Hinging on the idea that social interaction that makes learning stick, the planning committee is arranging two facilitated sessions for Spring Meeting attendees with responsibilities in one or both of these areas. These 75-minute sessions will be led by experienced practitioners in the field who will have attendees discuss and brainstorm solutions to challenges facing the profession in these areas. This will provide a platform for actuaries to discuss issues, learn and network.

Facilitators: Steve Armstrong, Vice President – Pricing and Analytics, Allstate  
Bob Wolf, Vice President & Chief Actuary, Stonetrust Insurance

# GENERAL AND CONCURRENT SESSIONS

9:45 a.m. – 11:15 a.m.



## General Session 4: Wildfire and Flood Situation in North America

### Grand Ballroom West & Centre

North America has experienced significant wildfire and flood catastrophes in recent years. The May 2016 Fort McMurray wildfire in Alberta will be the costliest insured disaster in Canadian history and the August 2016 Louisiana Flood, the worst U.S. disaster since Hurricane Sandy in October 2012. Multiple wildfires occurred on the West Coast in 2015; Toronto went through a large storm and flash flooding in July 2013.

In the U.S., there has also been an ongoing political and insurance industry debate over how to provide more affordable and robust flood coverage than currently provided by FEMA. Some Canadian companies recently started to provide private flood insurance.

The first speaker will talk about flood modeling in the U.S. and Canada. He will also discuss the issues around wildfire modeling. The second speaker will discuss how flood insurance could be privatized and the challenges to overcome for privatization.

#### Learning Objectives:

- Refine pricing loads for wildfire risk.
- Refine pricing loads for flood risk.
- Contrast public and private flood insurance coverages.

Moderator/Panelist: Benoit Carrier, Managing Director, Aon Benfield

Panelists: Steven Jakubowski, President, Impact Forecasting

Ned Dolese, CEO, Coastal American Insurance Company

# PERSONAL ATTENDANCE RECORD

The Casualty Actuarial Society (CAS) designates this educational activity for a maximum of 17.9 CE credits (including optional roundtables and sessions on Tuesday) or 15.2 CE credits (including optional roundtables only). Participants should claim credit commensurate with the extent of their participation in the activity. It is an actuary's responsibility to make a reasonable, good-faith determination of what CE opportunities will enhance his or her ability to practice in a desired field. CAS members earn 1 CE Credit per 50 minutes of educational session time, not to include breaks or lunch.

Educational Activity	Day	Start Time	Attended
<b>Featured Speaker (earn up to 1.2 CE )</b>			
Eric Garland	M	9:15 a.m.	_____
<b>General Sessions (earn up to 1.8 CE per General Session)</b>			
G-1 TED Talks — Technology Developments Affecting Insurance	M	11:20 a.m.	_____
G-2 The U.S. Election and the Affordable Care Act	T	8:00 a.m.	_____
G-3 Economic Capital Modeling — Is it Impacting Business Decisions?	T	8:00 a.m.	_____
G-4 Wildfire and Flood Situation in North America	W	9:45 a.m.	_____
<b>Concurrent Sessions (earn up to 1.5 CE per Concurrent Session)</b>			
C-1 Actuarial Perspectives in the Era of Social Consciousness	W	8:00 a.m.	_____
C-2 Addressing Unconscious Bias in the Workplace	T	10:00 a.m.	_____
C-3 Casualty: You're Doing it Wrong	T	10:00 a.m.	_____
C-4 Claims Level Analytics	T	1:15 p.m.	_____
C-5 Climate Change Risks and Opportunities for Actuaries	T	2:45 p.m.	_____
C-6 Current Applications of Microinsurance Innovations	W	8:00 a.m.	_____
	T	6:30 a.m.	_____
	T	10:00 a.m.	_____
C-7 Data and Cybersecurity: Legal and Regulatory Developments	M	3:00 p.m.	_____
C-8 Data Visualization	W	8:00 a.m.	_____
C-9 Declaring and Estimating Industry Catastrophes	T	1:15 p.m.	_____
C-10 Estimating VaR Deep in the Tail: A Practical Method and Tales from Implementation for Solvency II in Mexico	M	1:15 p.m.	_____
C-11 Focus on New Fellows: Volunteering, Millennials and the Growing CAS	M	3:00 p.m.	_____
C-12 GLM: A Deep Dive of Frequency-Severity vs. Pure Premium Approach	M	3:00 p.m.	_____

*All sessions will be recorded except where indicated above by an asterisk (\*).*

# PERSONAL ATTENDANCE RECORD

C-13	How Sustainability Practices Impact P&C Insurance	T	10:00 a.m.	_____
C-14	How to Effectively Use New and External Data	T	10:00 a.m.	_____
		W	8:00 a.m.	_____
C-15	Improving Actuarial Reserve Analysis Through Claim-Level Predictive Analytics	T	10:00 a.m.	_____
C-16	Influential Public Speaking: How to Be a More Effective Technical Communicator	T	10:00 a.m.	_____
		T	1:15 p.m.	_____
C-17	Insurance and the Rise of Drones	T	1:15 p.m.	_____
C-18	An Introduction to InsurTech	M	1:15 p.m.	_____
C-19	Introduction to R, Part One	M	1:15 p.m.	_____
C-20	Introduction to R, Part Two	M	3:00 p.m.	_____
C-21	Is Affordability the Next Big Issue for Automobile Insurers?	M	1:15 p.m.	_____
C-22	Lights! Camera! Professionalism!*	M	1:15 p.m.	_____
		W	8:00 a.m.	_____
C-23	Ontario Auto Reform: A Review of the Impact on Changes Occurring Over the Past 10 Years	T	1:15 p.m.	_____
C-24	Overview and Practical Application of Machine Learning Methods in Pricing	T	1:15 p.m.	_____
C-25	The Predictive Modeling Context With Minimum Bias, GLMs and Credibility	M	1:15 p.m.	_____
C-26	Presenting to Non-Actuaries	M	3:00 p.m.	_____
C-27	The Risk Impact of the Internet of Things	M	3:00 p.m.	_____
C-28	Tax Changes and the Impact on the Insurance Market	T	10:00 a.m.	_____
C-29	An Update from Admissions*	M	3:00 p.m.	_____
C-30	Wellness Data: The Next UBI?	T	1:15 p.m.	_____
C-31	Who Wants To Be An Actuary?	T	1:15 p.m.	_____
LL-1	ERM	M	3:00 p.m.	_____
LL-2	Predictive Analytics	W	8:00 a.m.	_____
P-1	Exploring New Frontiers: Applying a Credibility Framework to Price a New Product Line and Using Nonparametric Regression with Missing Data	M	1:15 p.m.	_____
--	Roundtable Discussions (up to 1.2 CE)*	T	2:45 p.m.	_____

*All sessions will be recorded except where indicated above by an asterisk (\*).*

# 2017 SPRING MEETING SCHEDULE

## Sunday, May 21

4:00 p.m. – 6:30 p.m.	Registration.....	Concourse Checkroom
5:00 p.m. – 6:30 p.m.	Recognition Reception for New Associates and their Spouses/Guests .....	Waterfall Garden
6:00 p.m. – 6:30 p.m.	New ACAS Photo Session.....	TBD
6:30 p.m. – 7:30 p.m.	Welcome Reception .....	Dominion Ballroom & Foyer

## Monday, May 22

7:00 a.m. – 4:30 p.m.	Registration.....	Concourse Checkroom
7:00 a.m. – 5:00 p.m.	Attendee Lounge .....	Wentworth (2nd Floor)
7:00 a.m. – 9:00 a.m.	Continental Breakfast .....	Sheraton Hall/Osgoode Ballroom West
8:00 a.m. – 8:30 a.m.	Welcome, Sponsored by EY, Celebration of New Members.....	Grand Ballroom West & Centre
8:30 a.m. – 9:15 a.m.	Business Session.....	Grand Ballroom West & Centre
9:15 a.m. – 9:45 a.m.	Refreshment Break .....	Sheraton Hall/Osgoode Ballroom West
	New Member Group Photo Session .....	TBD
9:45 a.m. – 10:45 a.m.	Featured Speaker.....	Grand Ballroom West & Centre
10:45 a.m. – 11:00 a.m.	Transition Break	
11:00 a.m. – 12:15 p.m.	General Session I .....	Grand Ballroom West & Centre
12:15 p.m. – 1:15 p.m.	Luncheon, Sponsored by Milliman .....	Sheraton Hall/Osgoode Ballroom West
1:15 p.m. – 2:30 p.m.	Concurrent Sessions	

City Hall Room	Civic Ballroom North	Civic Ballroom South
C-21: Is Affordability the Next Big Issue for Automobile Insurers?	C-10: Estimating VaR Deep in the Tail: A Practical Method and Tales from Implementation for Solvency II in Mexico	C-25: The Predictive Modeling Context With Minimum Bias, GLMs and Credibility

Dominion South	Dominion North	Provincial Ballroom	Simcoe / Dufferin
C-22: Lights! Camera! Professionalism!	C-18: An Introduction to InsurTech	C-19: Introduction to R, Part One	P-1: Exploring New Frontiers: Applying a Credibility Framework to Price a New Product Line and Using Nonparametric Regression with Missing Data

2:30 p.m. – 3:00 p.m.	Refreshment Break, Sponsored by The CAS Institute .....	Sheraton Hall/Osgoode Ballroom West
3:00 p.m. – 4:15 p.m.	Concurrent Sessions	

Churchill	City Hall Room	Civic Ballroom North	Civic Ballroom South
LL-1: ERM	C-11: Focus on New Fellows: Volunteering, Millennials and the Growing CAS	C-27: The Risk Impact of the Internet of Things	C-12: GLM: A Deep Dive of Frequency-Severity vs. Pure Premium Approach

Dominion South	Dominion North	Provincial Ballroom	Simcoe / Dufferin
C-7: Data and Cybersecurity: Legal and Regulatory Developments	C-26: Presenting to Non-Actuaries	C-20: Introduction to R, Part Two	C-29: An Update from Admissions

5:00 p.m. – 6:30 p.m.	Officers' Reception for New Fellows and their Spouses/Guests .....	Osgoode Ballroom West
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# 2017 SPRING MEETING SCHEDULE

## Tuesday, May 23

6:30 a.m. – 7:30 a.m.	Optional Concurrent Session C-6: Current Applications of Microinsurance Innovations .....	Grand Ballroom East
7:00 a.m. – 11:30 a.m.	Registration.....	Concourse Checkroom
7:00 a.m. – 4:00 p.m.	Attendee Lounge .....	Wentworth (2nd Floor)
7:00 a.m. – 9:00 a.m.	Continental Breakfast, Sponsored by The CAS Institute.....	Sheraton Hall/Osgoode Ballroom West
8:00 a.m. – 9:30 a.m.	General Session II.....	Grand Ballroom West & Centre
8:00 a.m. – 9:30 a.m.	General Session III .....	Grand Ballroom East
8:40 a.m. – 4:15 p.m.	Student Program .....	Simcoe/Dufferin
9:30 a.m. – 10:00 a.m.	Refreshment Break.....	Sheraton Hall/Osgoode Ballroom West
10:00 a.m. – 11:15 a.m.	Concurrent Sessions	

City Hall Room	Civic Ballroom North	Civic Ballroom South	Dominion South
C-13: How Sustainability Practices Impact P&C Insurance	C-3: Casualty: You're Doing it Wrong	C-14: How to Effectively Use New and External Data	C-6R: Current Applications of Microinsurance Innovations

Dominion North	Provincial Ballroom	Churchill Room	Grand Ballroom East
C-15: Improving Actuarial Reserve Analysis Through Claim-Level Predictive Analytics	C-16: Influential Public Speaking: How to Be a More Effective Technical Communicator	C-28: Tax Changes and the Impact on the Insurance Market	C-2: Addressing Unconscious Bias in the Workplace

11:15 a.m. – 1:15 p.m.	Lunch on Your Own	
12:45 p.m. – 2:00 p.m.	Registration.....	Concourse Checkroom
1:15 p.m. – 2:30 p.m.	Concurrent Sessions	

City Hall Room	Civic Ballroom North	Civic Ballroom South	Dominion South
C-30: Wellness Data: The Next UBI?	C-23: Ontario Auto Reform: A Review of the Impact on Changes Occurring Over the Past 10 Years	C-31: Who Wants To Be An Actuary?	C-17: Insurance and the Rise of Drones

Dominion North	Provincial Ballroom	Churchill Room	Grand Ballroom East
C-4: Claims Level Analytics	C-16R: Influential Public Speaking: How to Be a More Effective Technical Communicator	C-9: Declaring and Estimating Industry Catastrophes	C-24: Overview and Practical Application of Machine Learning Methods in Pricing

2:45 p.m. - 4:00 p.m.	Optional Concurrent Session C-5: Climate Change Risks and Opportunities for Actuaries .....	Grand Ballroom East
3:00 p.m. – 4:00 p.m.	Roundtables	

City Hall Room	Civic Ballroom North	Civic Ballroom South	Dominion South
R-1: Data Visualization	R-2: Diversity in the Actuarial Profession	R-3: Internet of Things	R-4: Microinsurance Working Party

Dominion North	Provincial Ballroom North	Provincial Ballroom South	Churchill Room
R-5: The New Associates Perspective: Advancing Your Career through the CAS	R-6: Presenting to Non-Actuaries	R-7: Sustainability Practices in P&C Insurance	R-8: An Update from Admissions

6:30 p.m. – 9:30 p.m.	Tuesday Evening Buffet Dinner, Sponsored by Verisk/ISO.....	Hockey Hall of Fame and Museum
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# 2017 SPRING MEETING SCHEDULE

## Wednesday, May 24

7:00 a.m. – 11:30 a.m.	Registration.....	Concourse Checkroom
7:00 a.m. – 11:30 a.m.	Attendee Lounge .....	Wentworth (2nd Floor)
7:00 a.m. – 9:00 a.m.	Continental Breakfast .....	Sheraton Hall/Osgoode Ballroom West
8:00 a.m. – 9:15 a.m.	Concurrent Sessions	

Churchill	Civic Ballroom North	Civic Ballroom South	Dominion South	Dominion North	Provincial Ballroom
LL-2: Predictive Analytics	C-14R: How to Effectively Use New and External Data	C-5R: Climate Change Risks and Opportunities for Actuaries	C-22R: Lights! Camera! Professionalism!	C-1: Actuarial Perspectives in the Era of Social Consciousness	C-8: Data Visualization

9:15 a.m. – 9:45 a.m.	Refreshment Break.....	Grand Foyer
9:45 a.m. – 11:30 a.m.	General Session IV & Adjournment.....	Grand Ballroom West & Centre

## SPOUSE/GUEST PROGRAM

### Sunday, May 21

4:00 p.m. – 6:30 p.m.	Registration – Concourse Checkroom
5:00 p.m. – 6:30 p.m.	Recognition Reception for New Associates and their Spouses/Guests – Waterfall Garden
6:30 p.m. – 7:30 p.m.	Welcome Reception – Dominion Ballroom & Foyer

### Monday, May 22

7:00 a.m. – 9:00 a.m.	Continental Breakfast – Sheraton Hall/Osgoode Ballroom West
8:00 a.m. – 8:45 a.m.	Welcome, Celebration of New Members – Grand Ballroom West & Centre
5:00 p.m. – 6:30 p.m.	Officers' Reception for New Fellows and their Spouses/Guests – Osgoode Ballroom West

### Tuesday, May 23

7:00 a.m. – 9:00 a.m.	Continental Breakfast – Sheraton Hall/Osgoode Ballroom West
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### Wednesday, May 24

7:00 a.m. – 9:00 a.m.	Continental Breakfast – Sheraton Hall/Osgoode Ballroom West
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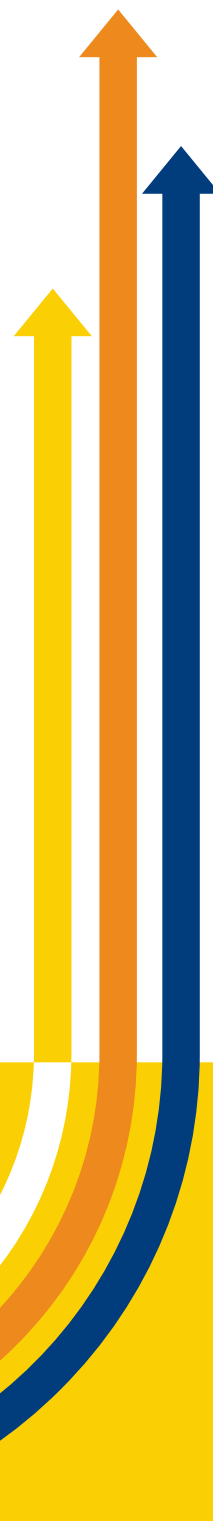




# LIFE HAPPINESS LIBERTY

At Liberty Mutual, we embrace all that fulfills and inspires our employees. That's why we create a workplace that gives them more room to stretch. To raise their voice. To make a real difference in the world. We're proud to be a company that champions our employees' pursuits — both at work and in life.

[libertymutualgroup.com/careers](https://libertymutualgroup.com/careers)

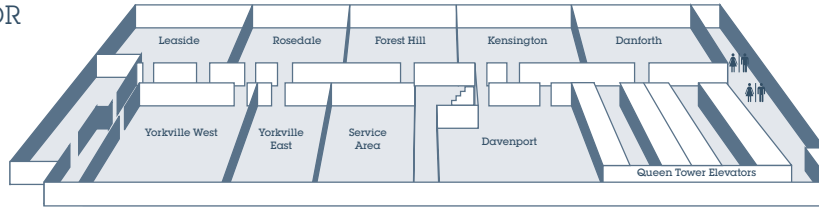


Liberty Mutual Insurance is an equal opportunity employer. We acknowledge, welcome, and accept the differences that each employee brings to the workplace.

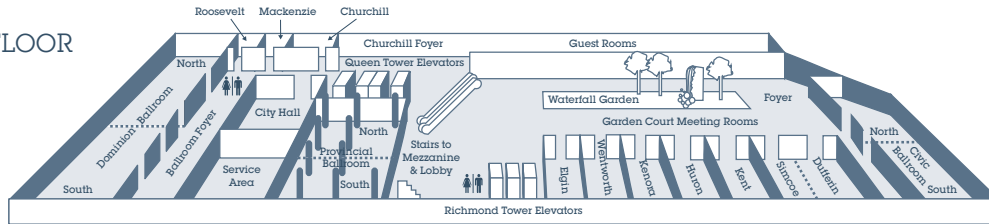


# HOTEL MAP

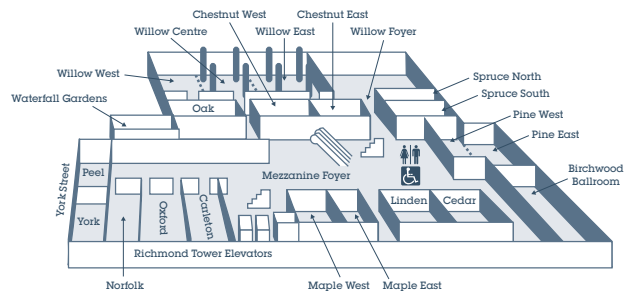
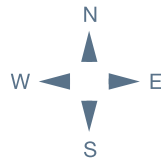
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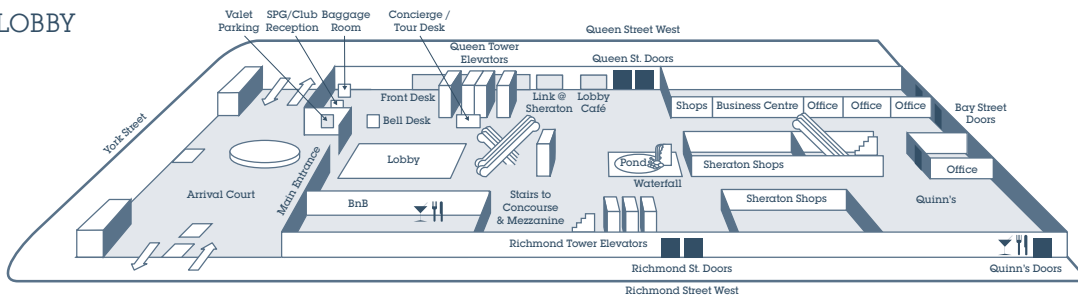
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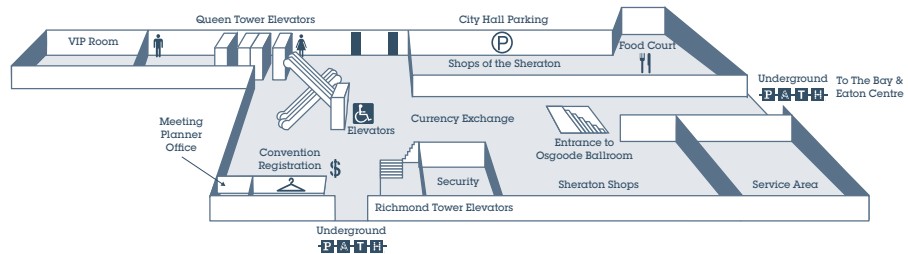
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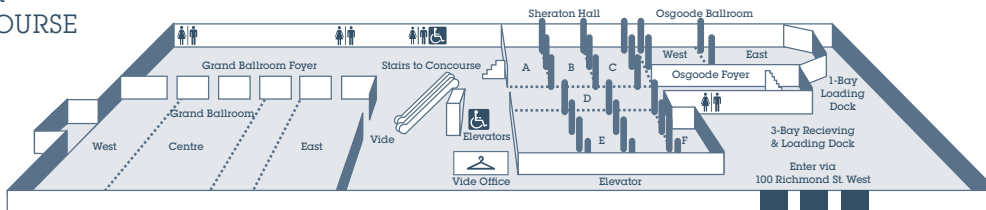
## LOBBY



## CONCOURSE



## LOWER CONCOURSE





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