Mobility Systems: Land, Sea, Air and Space

GLINCOSE 14th Annual GLNC
Regional ConferenceNCDetroit, MI, USA
Rescheduled for Fall of 2022

Hybrid Edition



The International Council on Systems Engineering (INCOSE) is a not-for-profit membership organization founded (in 1990) to develop and disseminate the trans-disciplinary principles and practices that enable the realization of successful systems. INCOSE is designed to connect systems engineering professionals with educational, networking, and career-advancement opportunities in the interest of developing the global community of systems engineers and systems approaches to problems. We are also focused on producing state-of-the-art work products that support and enhance this discipline's visibility in the world.



To address complex societal and technical challenges by enabling, promoting, and advancing systems engineering and systems approaches.

119 INCOSE Corporate Advisory Board (CAB) Member Organizations (June 2021)

321 Gang, Inc Aerospace Corporation. The Airbus AM General LLC Analog Devices, Inc. ARAS Corp Australian National University Aviation Industry Corporation of China BAE Systems Ball Aerospace Bechtel Becton Dickinson Blue Origin Boeing Company, The **Bombardier Transportation** Booz Allen Hamilton Inc. C.S. Draper Laboratory, Inc. California State University Carnegie Mellon University SEI Change Vision, Inc. Colorado State University SE Programs Cornell University Cranfield University Cubic Cummins Inc. Cybernet MBSE Co, Ltd Defense Acquisition University Deloitte Consulting, LLC **Denso Create Inc** Drexel University

Eindhoven University of Technology EMBRAER ENAC Federal Aviation Administration (FAA) Ford Motor Company Fundacao Ezute General Dynamics **General Electric Aviation** General Motors George Mason University Georgia Institute of Technology IBM Idaho National Laboratory ISAE - Supaero ISDEFE ITID, Ltd Jacobs Jama Software Jet Propulsion Laboratory John Deere Johns Hopkins University KBR **KEIO** University L3Harris Technologies Leidos Lockheed Martin Corporation Los Alamos National Laboratory ManTech International Corporation Maplesoft Massachusetts Institute of Technology (MIT)

MBDA (UK) Ltd

Missouri University of Science & Technology MITRE Corporation, The Mitsubishi Heavy Industries, Ltd NASA National Reconnaissance Office (NRO) National Security Agency Enterprise Systems Naval Postgraduate School Nissan Motor Co, Ltd No Magic Inc. (Dassault Systemes) Northrop Grumman Corporation Pacific Northwest National Laboratory Pennsylvania State University Peraton Petronas Nasional Berhad Prime Solutions Group, Inc Project Performance International (PPI) QRA Corp **Raytheon Corporation Roche Diagnostics** Rolls-Royce Saab AB SAIC Sandia National Laboratories Siemens Sierra Nevada Corporation Singapore Institute of Technology Skoltech SPEC Innovations Stellar Solutions

Stevens Institute of Technology Strategic Technical Services LLC Swedish Defense Materiel Administration Systems Planning and Analysis Thales **Torch Technologies Trane Technologies** Tsinghua University TUS Solution LLC UC San Diego UK Ministry of Defense (MoD) University of Alabama in Huntsville University of Arkansas University of Connecticut University of Maryland University of Maryland, Baltimore County University of Michigan, Ann Arbor University of New South Wales University of Southern California University of Texas at El Paso (UTEP) University of Washington ISE US Department of Defense (DoD) Veoneer VG2PLAY Vitech Volvo Construction Equipment Woodward Inc Worcester Polytechnic Institute- WPI

Zuken Inc



Alliances and Collaborations – by Memorandum of Understanding (MoU) * CLICK ON THE LOGOS BELOW TO LEARN MORE



* Not all INCOSE inter-organizational Alliances and Collaborations are shown. This is a sampling of example MoUs in June of 2021.

Three Sectors with 74* Chapters in 35 Countries

* Some emerging (new) chapters not shown below.

Sector III

Asia-Oceana

(9 Chapters)

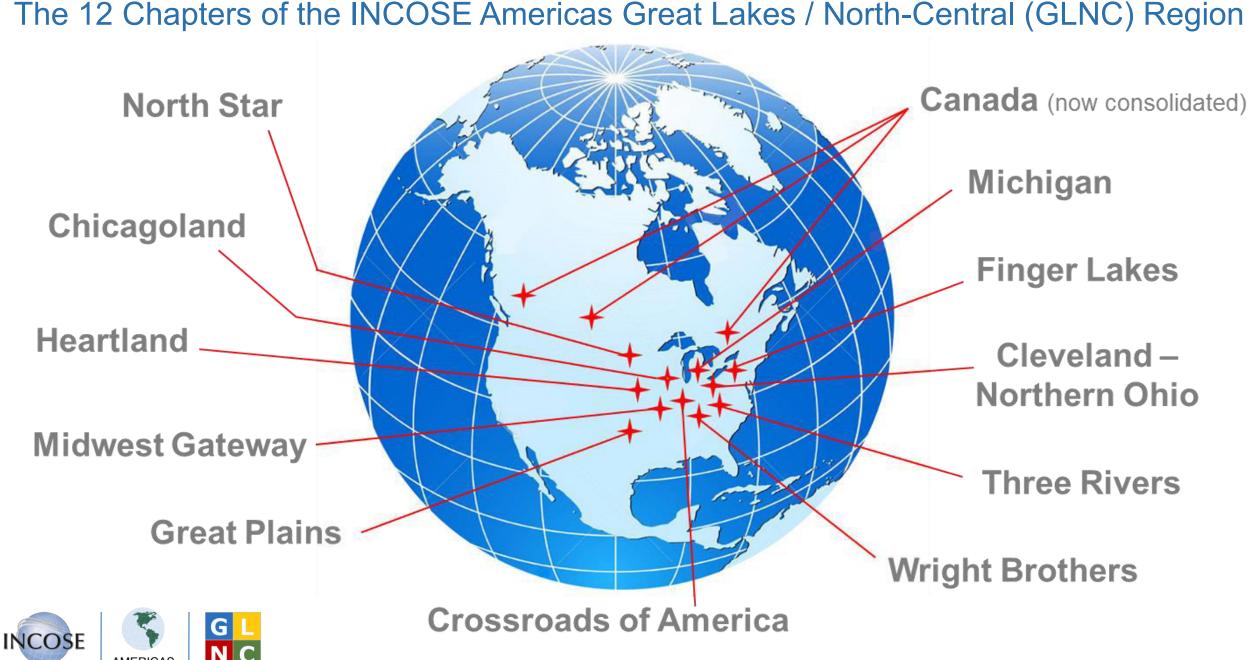




Sector II

EMEA

(16 Chapters)





The Westin Book Cadillac^{*} Historic[†] Luxury Hotel and Conference Center



Great Lakes

North-Central Region

Note: The GLNC14 planners are currently working with stakeholders and the Marriott/Book Cadillac to select new dates for the postponed Nov 30-Dec 3, 2021 event.

TITLE

A Marriott Hotel

[†] A Contributing Property of the Detroit Washington Boulevard U.S. Historic District

INCOSE 14th Annual GLNC Regional Conference

Fall 2022: Date selection status on page 21.

WESTIN

Vehicle Systems and Technologies

Electric Propulsion

 Autonomous Control
 Communication (V2X)
 Batteries & Charging
 Communication (V2X)



Urban Planning / Smart Cities

Future Vehicles • EV Charging Connectivity

Innovation & Economic Development GTE L'orna Levern 6

Critical Infrastructure



Keynote Speakers (with notable books)



Dr. Tina P. Srivastava

MIT Aeronautics and Astronomics Engineering Fellow, MIT System Design & Management Co-Chair, INCOSE PM-SE Integration WG



(1) Innovating in a Secret World: The Future of National Security and Global Leadership.
(2) Integrating Program Management and Systems Engineering: Methods, Tools and Organizational Systems for Improving Performance (contributing author).



Dr. Bruce Powel Douglass

Senior Principal Systems Engineer, MITRE Chief Evangelist (SysML/UML), IBM (1995-2019)



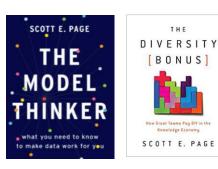
(1) Agile Model-Based Systems Engineering Cookbook. (2) Agile Systems Engineering *

* Bruce has authored twenty books.



Dr. Scott Page

Professor of Complexity, Social Science, and Management; Center for the Study of Complex Systems, University of Michigan



(1) The Model Thinker: What You Need to Know to Make Data Work for You. (2) The Diversity Bonus: How Great Teams Pay Off in the Knowledge Economy

Keynote Speakers (with notable books)



Claude Laporte, Ph.D.

Co-Chair, INCOSE Small Business Systems Engineering Working Group Professor, École de Technologie Supérieure (ÉTS), Montreal, Quebec, Canada



(1) Systems EngineeringPractices for Small and MediumEnterprises (co-author). (2)Software Quality Assurance (co-author)



Nehal Patel

Dr. Rick Hefner

Program Director,

and Management

Education, Caltech

Center for Technology

Senior Global Program Manager, Amazon Robotics



Practical Project Management for Engineers

Keynote and Featured Speakers

Rick Hefner is the Program Director for Caltech's Center for Technology and Management Education, which designs and delivers customized professional training to technology-driven organizations. He has over 40 years of experience in systems development, research, and management, and has served in industrial, academic, and government positions. Dr. Hefner has worked with numerous companies including AeroVironment, Applied Physics Laboratory, Applied Materials, Ares Management, Boeing, DRS Technologies, Halliburton, Herbalife, Honeywell, Jet Propulsion Laboratory, John Deere, L-3 WESCAM, Maytag, Motorola, Northrop Grumman, Pacific Bell, Raytheon, Schlumberger, Southern California Edison, St. Jude Medical, Toshiba, TRW, U.S. Navy, and Xerox. Dr. Hefner is credited with over 200 publications and presentations and is a certified Lean Six Sigma Black Belt. He earned his PhD from UCLA and his MS and BS from Purdue University. He is Past-President, INCOSE Los Angeles Chapter.

Keynote and Featured Speakers (not all shown)



Trevor Pawl

Chief Mobility Officer, State of Michigan Michigan Economic Development Corporation Office of Future Mobility and Electrification



Thomas M. Doehne

Office of Technology Incubation and Innovation, Technology Transfer NASA Glenn Research Center Trevor Pawl is the Chief Mobility Officer for the State of Michigan, and leads the Michigan's Office of Future Mobility and Electrification. In this position, Pawl is responsible for working across state government, academia and private industry to grow Michigan's mobility ecosystem through strategic policy recommendations and new support services for companies focused on the future of transportation. Visit: https://www.michiganbusiness.org/ofme/

The Technology Transfer Office at NASA Glenn Research Center (GRC) ensures that innovations developed for aeronautics and space exploration are made broadly available to the public – boosting the U.S. economy and maximizing the return on the nation's investment in NASA. The GRC has unique expertise in many areas, including materials and coatings, sensors, satellite and deep space communications, electrical/electronics, and power generation and storage. In addition, the office has a diverse portfolio of inventions available for licensing, especially in the categories of sensors, aeronautics, and information technology and software.

Visit https://technology.grc.nasa.gov/ and https://www.youtube.com/watch?v=QljEHEADX1k



Kerry Lunney

President, International Council on Systems Engineering (INCOSE) Engineering Director and Chief Engineer, Thales Australia

Kerry Lunney is Engineering Director and Chief Engineer of Thales Australia. In this role she provides technical leadership and governance, and participates on a number of technical boards and communities of Thales. Kerry has extensive experience developing and delivering large system solutions, including design, software development, infrastructure implementation, hardware deployments, integration, sell-off, training and on-going support. She has worked in various industries including ICT, gaming, financial services, transport, and aerospace and defense. She has worked in Australia, Asia and the USA. Her experience includes combat systems, mission systems, communication systems, road and rail ITS's, flight simulators, security systems, vehicle electronic systems, gaming systems and ICT foundation systems. Kerry is currently serving a two-year term (2020-2021) as President, International Council on Systems Engineering (INCOSE). Prior to this she served as a member of the INCOSE Board of Directors representing INCOSE's Asia-Oceania Sector, and as national president of the Systems Engineering Society of Australia (SESA). Kerry is also a member of IEEE, a Fellow of Engineers Australia with the status of Engineering Executive and Chartered Professional Engineer, and a certified INCOSE Expert Systems Engineering Professional (ESEP).

Keynote and Featured Speakers (not all shown)



Brett Hillhouse

Global Automotive Leader IBM AI Applications As Global Automotive Leader for IBM AI Applications, Brett Hillhouse's responsibilities include industry and technology strategy, as well customer success for automotive companies around the world. His 25+ years of industry experience includes transformation engagements at global automotive and aerospace OEM's and Tier 1 suppliers. The scope of these engagements include transformation of product development, reuse strategy and implementation, manufacturing 4.0, supply chain management and compliance consulting. Previously, Mr. Hillhouse has held several industry and leadership positions at IBM and Siemens (formerly SDRC). Brett holds a BS in Mechanical and Aerospace Engineering from Cornell University.

Gavin Brown

Chair, North American Space Summit (NASS) Executive Director, Michigan Aerospace Manufactures Association (MAMA) Gavin Brown heads up the Michigan Launch Initiative (MLI) which is focused on establishing vertical and horizontal launch space ports in the State of Michigan. He is the executive director of the Michigan Aerospace Manufactures Association and chairs the North American Space Summit (NASS), held annually in Traverse City, MI. (Overview - Press Story)



Jon Mooney, PE

Co-Chair, Smart Cities Initiative, International Council on Systems Engineering (INCOSE) Principal, Acoustics by JW Mooney, LLC

Jon Mooney, PE, is Co-chair of the INCOSE Smart Cities Initiative, He has an extensive career as a consultant specializing in acoustics, vibration and systems engineering, and holds an MBA from St. Ambrose University, and a B.S. in Aerospace Engineering from the University of Cincinnati. Jon is a contributing editor to Walls & Ceilings magazine, an associate editor to Noise Control Engineering Journal, and author of Inventor's Guide to Identifying Profitable Ideas, JW Mooney's Practical Architectural Acoustics Notebook, and How to Be a Good Inventor. Recent Acoustics by JW Mooney, LLC projects include Willis Tower, Old Armory Concert Hall, Nationwide Children's Hospital Data Center, Northrop Grumman Conference Center, Genesis Hospital MRI suite, Ohio Health Neuroscience Wellness Center, and ISU Sports Performance Center. As Lead Acoustics Engineer with KJWW Engineering Consultants, 2007-2017, Mr. Mooney's 400+ projects included Bettendorf Event Center, Cedar River Fine Arts, Iowa Central Bio-Science, Renaissance Chicago, University of Chicago, Argonne National Laboratory, and Chicago Athletic Association. Between 1993-2007 Jon was Acoustics Consultant for 100+ projects including Oak Ridge National Laboratory, Cincinnati Art Museum, Carnegie Theater, Curtis Studios, Ray & Joan Kroc Corps Community Center. Jon's early career with L3 KDI Precision Products and Martin Marietta, as Aerospace R&D and Co-op Engineer, included work on the Patriot Missile, Skylab and Space Shuttle.

INCOSE GLNC14 Conference Program Schedule: Event Day 1 (Arrival / Private Tour)

Arrival – Tour – Check-in – Set-up – Reception



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14

American Center for Mobility

Click Here to Visit ACM Website

The American Center for Mobility (ACM) is a collaborative effort comprised of government, industry and academic organizations focused on accelerating the mobility industry through research, testing, standards development and educational programming. Located in Southeast Michigan on over 500-acres at the historic Willow Run site in Ypsilanti, MI.



Smart Mobility Test Center

The ACM is a one-of-a-kind global **Smart Mobility Test Center** providing a platform for the integration of emerging mobility technologies in intentionally challenging environments. With over 500 acres of variable road systems and customizable test environments, ACM offers:

- Comprehensive Intelligent Transportation System (ITS) network
 World's first CAV specific 5G Network (AT&T Global Test Bed)
 Closed data network to support testing and product development
- activities
 Cloud services for high volume data transfer
 Professional engineering services

Private vehicle laboratories







INCOSE GLNC14 Conference Program Schedule: Event Day 2 (Main Program)

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Plenary Track (Live-Streamed)

Breakout Track (Zoom Hybrid)

Virtual/Live Exhibit Hall / Student Career Fair

Morning Plenary Track: 9:00am–12:30pm EST

Future Mobility

- Complex Systems of Systems
- Land, Sea, Air and Space
- Electrification, Autonomy, Connected
- IoT / AI / Telecommunications / GPS
- Infrastructure (local and global)
- Charging Stations / Infrastructure
- Smart Cities / Urban Planning
- Smart Mobility / Smart Intersections

Afternoon Plenary Track: 1:30pm – 5pm EST

Accelerating Innovation

- Start-up, Tech-Transfer, Small Business Programs (NASA, MEDC, other)
- Resources for Research, Development, Testing & Education/Training (Federal, State, Local, Private)

 Systems Engineering for rapid innovation, Start-ups, Small Business, Incubators, Lean/Agile projects in large organizations.

Breakout Track: (1) PM-SE Integration Workshop. (2) Bruce Douglass Agile MBSE Workshop.

INCOSE GLNC14 Conference Program Schedule: Event Day 3 (Main Program)

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Plenary Track (Live-Streamed)

Breakout Track (Zoom Hybrid)

Virtual/Live Exhibit Hall / Student Career Fair

Morning Plenary Track: 9:00am–12:30pm EST

Engineering Systems

- Understanding, Designing and Managing Complex Systems
- Integrating Project/Program Management & Systems Engineering
- Infrastructure Systems Engineering
- SE Fundamentals and Competency
- System Thinking & Modeling
- Building Organizational SE Capability

Afternoon Plenary Track: 1:30pm – 5pm EST

MBSE / Digital Engineering

- Model-Based Systems Engineering (MBSE) / Agile MBSE
- Modeling Languages (UML, SysML, etc.)
- Systems for System Modeling
- MBSE and Modeling System of Systems
- Diversity in Applications of MBSE
- Accelerating Innovation Using MBSE

Breakout Track: (1) No Magic MBSE Tutorial. (2) Smart Cities Workshop – Part 1. (3) NASA Tech-Transfer Program Workshop.

INCOSE GLNC14 Conference Program Schedule: Event Day 4 (Workshops & Tour)

Tours

Breakout Tracks (Zoom Hybrid & Virtual)

Virtual) – Student Career Fair

Workshops (Hybrid/Virtual): 8:30am–5pm EST

Tours: 9am – 5pm EST

Smart Cities Workshop

• Part 2 of 21. Hosted by INCOSE Smart Cities Initiative with in-person and virtual participation from Urban Planning schools and cities worldwide.

Other Workshops/Tutorials

- Smart/Micro Grid Systems Modeling
- Additional MBSE-related material
- Overflow Sessions: NASA / MEDC Small Business & Start-up Programs

Motown Museum

- Original Hitsville USA recording studio and offices. Amazing!
- <u>https://www.motownmuseum.org/</u>

Museum Group Discount Tickets Provided with Conference Registration

INCOSE GLNC14 Conference Program Schedule: Date Selection Information (Status on 19Jan2022)

The GLNC14 event scheduled for Nov 30-Dec 3, 2021 was postponed due to number of factors related to the COVID-19 pandemic, including a sudden unexpected surge in cases and hospitalizations in Michigan and the Detroit area just prior to the event. The following date options are currently available for rescheduling at the Book Cadillac venue. All 4 options support the event program and floor plan layout "as designed" for the postponed Nov 30 – Dec 3, 2021 event.

Tuesday (Day 1) – Friday (Day 4) Date Options *

October 4-7, 2022: Reserved with the venue / Option #1 / Most preferred. November 1-4, 2022: Option #2 / Alternate to Option #1 (if necessary). November 15-18, 2022: Option #3 / Not preferred due to closeness to holidays. December 13-16, 2022: Option #4 / Not preferred due to closeness to holidays.

* Mon-Thur dates (in the same week) are also available for all 4 of the above options.



INCOSE 14th Annual GLNC Regional Conference

INCOSE GLNC Quartely Virtual Student Systems Engineering (SE) Career Fairs

Fall/Winter 2021-22 Virtual **Student SE Career Fair*** Nov 22 – Feb 4



Nov 22 – Feb 4 (24/7)

- Browse Company Virtual Booths
- Use Chatbots/IT to Connect
- Visit INCOSE Welcome Center
- Upload Your Resume

Explore the World of Opportunities in Systems Engineering (SE)

- Entry Level
- Internships

FREE to all students and recent graduates. The MOX/MOX induces the types complete constant if the testing is dard 2011. The first 2011 Mr is a scale up that establishes the environment operation and even in the types of the testing is dard 2011. The first 2011 Mr is a scale up that establishes the environment operation and even in the types of the testing is dard 2011. The first 2011 Mr is a scale up that establishes the environment operation and even in the types of the testing is dard 2011. The first 2011 Mr is a scale up that establishes the environment operation and even in the testing of the testing is dard 2011. The first 2011 Mr is a scale up that establishes the environment operation are in the testing of testing of the testing of t

Live Interactions:

- Coaching Sessions: Dec-Jan
- Interviews & One-on-Ones
 Round 1: Jan 25–27
 Round 2: Feb 2–4

Engage with INCOSE Corporate Advisory Board (<u>CAB</u>) and GLNC event-affiliated systems engineering (SE) employers:



INCOSE Chapter Sponsorship Opportunity



Virtual SE Student Career Fair Call for Employers

Annual Booth Subscriptions | Next Fair: Fall/Winter 2021-22



How the Fair Works

- Register for a Virtual Booth
- Set up virtual booth & chatbot
- Monitor chat & resume uploads
- Connect with best-fit candidates

Fall/Winter 2021-22 Fair

Connect with Top Systems Engineering (SE) Talent:

INCOSE-Affiliated SE Schools
 INCOSE Student Members

oth purchase includes Fall/Winter 2021-22, Spring & Summer 2022 Fairs
* The INCOSE/XOR virtual career fair system completed successful Beta testing in April 2021.
he fail 2021 fair is a scale up that establishes the envisioned on-going semi-annual event. Much
thanks to the employers, INCOSE Volunteers and students who participated in April 2021.

 Booth Set-up (takes 2-4 hrs) Dec 2021– Jan 21, 2022
 Live Interactions / Interviews Round 1: Jan 25–27 Round 2: Feb 2–4

Applicants seeking internship & entry-level SE positions are recruited from over 20 INCOSE-affiliated SE schools.



Virtual Student Systems Engineering Career Fair*

Employer Virtual Booth Set-up is continual and now in process. Employer Virtual Booth Opportunities

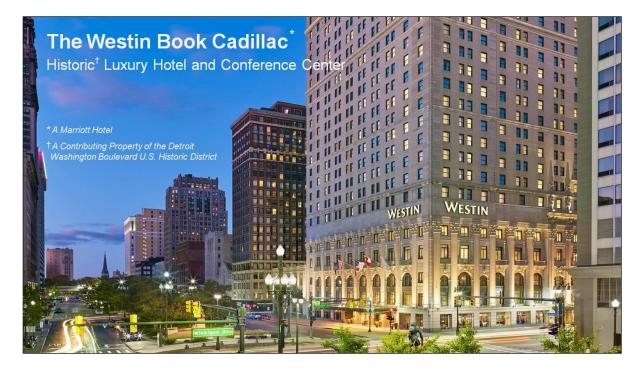
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L3HARR.

https://secareerfair.xor.ai/incose

SAIL

* There are 4 Fairs each year. The Fall/Winter 2021-22 Fair is setting up at this time. The Fall 2022 Fair will coincide with GLNC14. Booth purchases are on an annual basis.



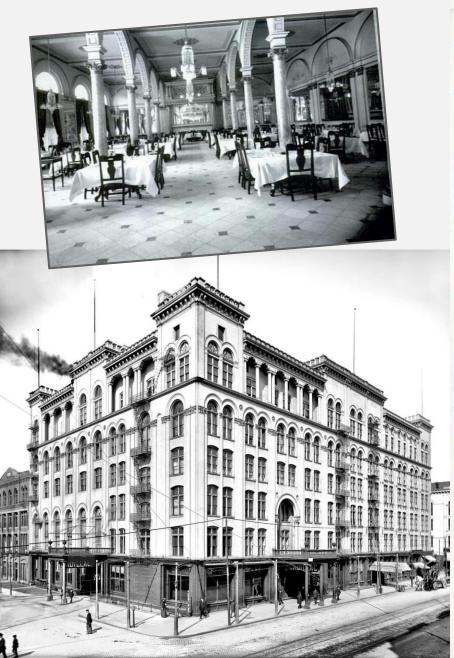
The Westin Book Cadillac

Historic Luxury Hotel and Conference Center 1114 Washington Boulevard, Detroit, MI 48226 Antoine de la Mothe Cadillac (1658–1730) was a French explorer and adventurer in New France, which stretched from Eastern Canada to Louisiana on the Gulf of Mexico. In 1701, he founded Fort Pontchartrain du Détroit, which became the city of Detroit. He was commandant of the fort until 1710. Between 1710 and 1716, he was the governor of Louisiana,



Cadillac was born Antoine Laumet on March 5, 1658, in the small town of Saint-Nicolas-de-la-Grave in the province of Gascony (today in the Tarn-et-Garonne, Occitanie). His father, Jean Laumet, was born in the village of Caumont-sur-Garonne, and was a lawyer in the Parliament of Toulouse. Jean was appointed lieutenant to the judge of Saint-Nicolas-de-la-Grave in 1652 and judge in 1664. Antoine's mother, Jeanne Péchagut, was the daughter of a merchant and landowner. La Mothe's youth included rigorous study at a Jesuit institution where he learned theology, the law, agriculture, botany and zoology. He enlisted in the military as a cadet at the age of 17 and within a few years became an officer in the Clérambault regiment. In 1683, at the age of 25, he departed from France to the New World.

Hotel Cadillac – 1888

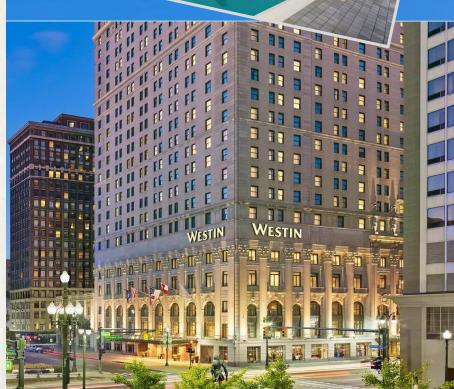


Book-Cadillac – 1924



Westin Book Cadillac – 2008

\$200 Million Reconstruction



On the "Fifth Avenue of the Midwest" – 1924

Announcing the MAGNIFICENT, NEW

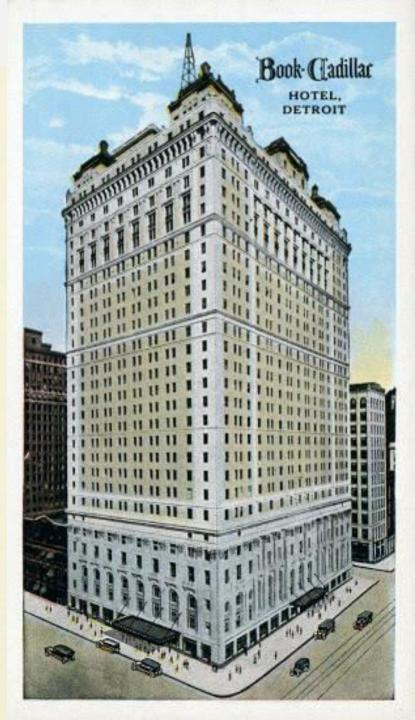
Book: Cadillac m DETROIT

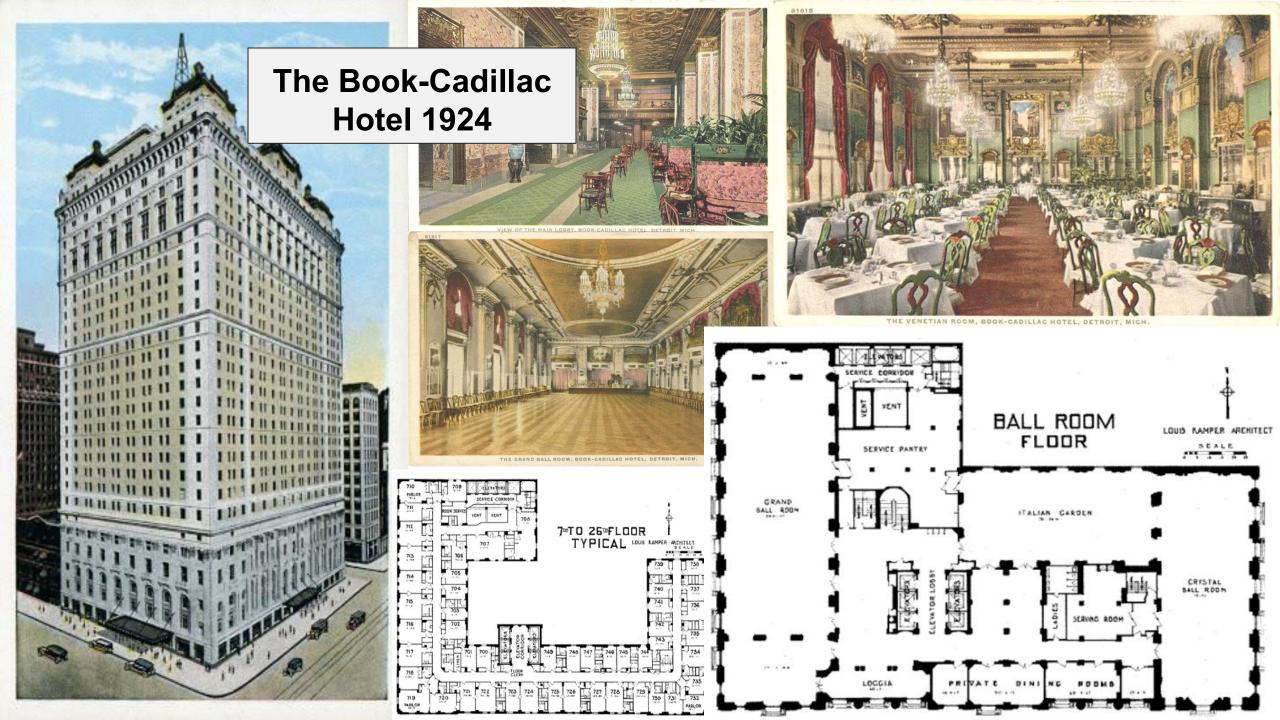
Opening the week of December 1, 1924, the new Book-Cadillac Hotel, Detroit, immediately takes rank with the finest hostelries of Europe and America.

The Book-Cadillac rises on the site of the former Hotel Cadillac at the intersection of Washington Boulevard and Michigan Avenue. Towering twentynine stories above the street, with twelve hundred rooms and bath, it is the tallest hotel structure in the world.

Under the personal direction of Mr. Roy Carruthers, nationally recognized authority in hotel management, every facility is provided for extending maximum courtesy and comfort to guests.

BOOK-CADILLAC HOTEL COMPANY, DETROIT ROY CARRUTHERS, President R. J. TOMPKINS, Resident Manager





Grand Ballroom 1924

As a Contributing Property in a U.S. Historic District, faithful restoration to the hotel's original grandeur was a primary objective.

Grand (Venetian) Ballroom* Today

* The restored Grand Ballroom was renamed in remembrance of the original 1924 Venetian Dining Room

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As a Contributing Property in a U.S. Historic District, faithful restoration to the hotel's original grandeur was a primary objective.

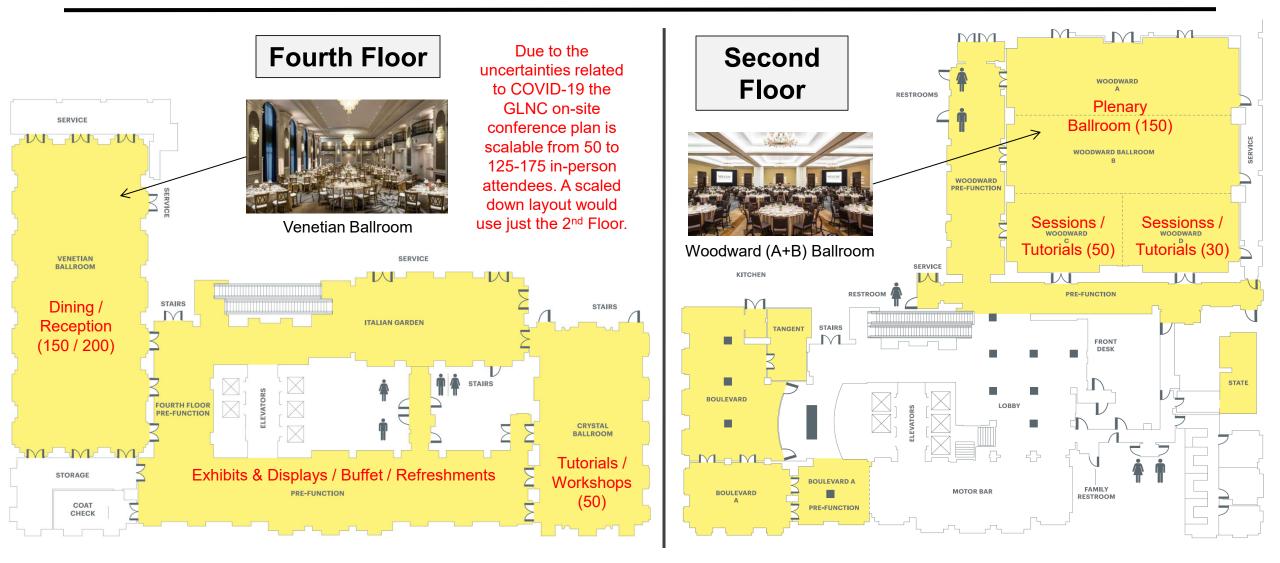
Woodward Ballroom (Conference Plenary Room)

WESTIN

a se call

WESTIN

General Layout: Function Rooms – Book Cadillac



The GLNC14 is a hybrid (virtual + in-person) event with on-site AV/IT by Marriot provider Encore Global and Virtual Platform by INCOSE provider KMD Events, Toulouse, France.

Main Conf. (Day 2 and Day 3): Room Schedule – Book Cadillac



The GLNC14 is a hybrid (virtual + in-person) event with on-site AV/IT by Marriot provider Encore Global and Virtual Platform by INCOSE provider KMD Events, Toulouse, France.

