



1791 Tullie Circle, N.E. / Atlanta, GA 30329
404-636-8400

TC/TG/TRG MEETING MINUTES

TC/TG/TRG NO. (TITLE): TC 5.9 Enclosed Vehicular Facilities
DATE/TIME OF MEETINGS: June 24, 2025 3:30 - 5:30 PM MST
LOCATION: Phoenix, AZ
Hybrid Conference

- ❖ The Chair, Dmitry Kogan, called the meeting to order at 3:30 pm MST.
- ❖ There were 5 of 7 voting members present, which met requirements for a quorum.
See attendee list attached to minutes.
- ❖ Chairman's Remarks – Dmitry Kogan
 - ❖ Provided a reminder of the ASHRAE Code of Ethics.
 - ❖ In ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, inclusiveness and respect for others, which exemplify our core values of excellence, commitment, integrity, collaboration, volunteerism and diversity, and shall avoid all real or perceived conflicts of interest. Our culture is one of inclusiveness, acknowledging the inherent value and dignity of each individual. We celebrate diverse and inclusive communities, understanding that doing so fuels better, more creative and more thoughtful ideas, solutions and strategies for the Society and the communities our Society serves. We respect and welcome all.
 - ❖ ASHRAE Artificial intelligence (AI) policy (approved Feb 9, 2025): ASHRAE prohibits the entry of content from any ASHRAE publication or related ASHRAE intellectual property (IP) into any AI tool, including but not limited to ChatGPT. Additionally, creating derivative works of ASHRAE IP using AI is also prohibited without express written permission from ASHRAE.
 - ❖ Welcome to all existing and new attendees
 - ❖ Presentation highlights from Chair meeting on Sunday June 22, 2025 morning.
 - ❖ ASHRAE Councils:
 - ❖ Publishing & Education Council: Responsible for all Society's publications, education and certifications
 - ❖ Technology Council: Responsible for providing policy guidance and implementing the Society's technical efforts, approving research projects with a total project cost <\$500K, and approving Standards committee recommendations
 - ❖ Get Involved: Nominations for elected positions are due September 2025, Nominations for appointed committees are due February 2026
 - ❖ TAC Update: 2025-2028 ASHRAE Strategic Plan/Strategic Initiatives:
 - ❖ Healthy, Sustainable and Resilient Communities
 - ❖ Empowered (skilled, competent & solution-oriented) Workforce
 - ❖ Organizational Agility
 - ❖ Emergent Technologies
 - ❖ Center for Excellence for Building Decarbonization (CEBD) 2025 Update
 - ❖ Strategic Theme #1 Engineering Guidance & Implementation
 - Top Priority: *Develop engineering guidance to accompany the ASHRAE/USGBC/NYSERDA Strategic Decarbonization Planning Guide*
 - ❖ Strategic Theme #2 Business Case Development & Market Transformation
 - Top Priority: *Business case for optimized (high-performance) buildings*

- ❖ Strategic Theme #3 Strategic Vision & Long-Term Planning
 - Top Priority: *Create a 2050 Building Decarbonization Roadmap*
- ❖ Strategic Theme #4 Strategic Vision & Long-Term Planning
 - Top Priority: Enhanced Engagement & Educational Programs
- ❖ Strategic Theme #5 AI Integration & Innovation
- ❖ New TC 9.13 SPACE (Extraterrestrial and Deep Space Environmental Control Systems)
 - ❖ Environmental control systems and components in and servicing enclosed spaces at deep space and extraterrestrial locations
 - ❖ The systems' function and ability to establish and maintain habitable levels of indoor environmental quality
 - ❖ The systems' safety, operation and maintenance, refrigerant usage, and performance in conditions different from Earth and Earth's atmosphere
- ❖ Liaison Reports
 - ❖ Section 5 Head (Esteban Baccini)
 - ❖ *Roster updates are possible before June 30th.*
 - ❖ *TAC strategic plan has been approved.*
 - ❖ *Electronic Communications Committee (ECC) -- online platform for all TC forms; completed by end of calendar year.*
 - ❖ *Activity Form is due tonight.*
 - ❖ Approval of minutes from 2025 Orlando Winter Meeting – *approved.*

- ❖ Membership/Roster
(All voting members and/or subcommittee chairs)

Name	Role	Voting		Name	Role	Voting
Dmitry Kogan	Chair	Yes		David Newman	Membership	
Sean Cassady	Vice Chair	Yes		Michael Feuser	Research Chair	Yes
David Hahm	Secretary	Yes		Elias Papadopoulos	Member	Yes
Yuan Li	Standards Chair	Yes		TJ Lyle	Member	Yes
Andrew Louie	Handbook Chair					
Yoon Ko	Program Chair					
Fraser Campbell	Webmaster					

- ❖ Subcommittee Reports
 - ❖ Programs Subcommittee (Yoon Ko)
 - ❖ No programs sponsored by TC5.9
 - ❖ See attached Program Sub-Committee Report
 - ❖ Research Subcommittee (David Hahm)
 - ❖ Research Committee
 - ❖ If you are a member of ASHRAE, you can download all handbooks and/or standards as PDF
 - ❖ Research budget - \$3.9 million
 - ❖ Encouraged TCs to submit RTARs
 - 8 tentative research projects under review
 - ❖ Full TC approvals (including co-sponsoring TCs) before submitting RTAR to ASHRAE

- ❖ David/Michael can help with writing RTAR
- ❖ Every 3 months deadline for RTARs
- ❖ Awards
 - New investigative award for graduate students
 - Innovative research grant
 - Individual excellence award
- ❖ FHWA research project update to be uploaded on the Basecamp for review and comment
- ❖ Working groups
 - ❖ Emergency ventilation for vehicular tunnels (Norris Harvey champion)
 - ❖ High Pressure transients (David Newman champion)
 - ❖ Freight train tunnel ventilation (David Newman)
 - ❖ Scott Shi: thermal comfort and critical velocity working groups updates
 - Thermal Comfort: Had a couple of productive meetings. Mark Gilbey has just shared an update based on Igor's comments during the last meeting. Now the action is on Scott to try to reduce the size of the document, Mark will then review with him before sharing again with the working group. Intent is to include in the Handbook Chapter and, eventually, in Standard 217.
 - Critical velocity: NFPA 502 (2026) update came in. Scott is in the progress of updating the draft. He'll set up a follow-up meeting in July to update the working group. The goal is still not introducing any new content outside of NFPA 130 and 502, but to update the narrative to include the latest updates from the NFPA. The working group will suggest any technical recommendations to be submitted to the NFPA Public Input process.
 - Both working groups are aiming to have the update to be formally presented and reviewed by the TC 5.9 later this year.
 - ❖ No RTAR/PTAR – any topics to share with David
- ❖ Handbook Subcommittee (Andrew Louie)
 - ❖ Update by Sal: Thermal Comfort and Critical Velocity working groups' updates will be incorporate into the Handbook Chapter. The Handbook Chapter is on the Basecamp.
- ❖ Standards Subcommittee (Yuan Li)
 - ❖ *Standard 217*
 - ❖ *2020 edition*
 - ❖ *2022 Addendum A*
 - ❖ *ASHRAE requested to reinitiate the standard*
 - ❖ *SPC 217 committee (approved by ASHRAE – 5 voting members plus non-voting members)*
 - *New members are welcome*
 - *Maintenance –discussing suggestions from Bill Lampkin for changes (driven by industry); include reference to Standard 241*
 - *Subcommittee meeting was right before TC 5.9 Phoenix meeting*
 - *Yuan/Igor will lead review of Chapters 1-5*
 - *David Newman/David Hahm: Chapter 6*
 - *Chapter 7-8: Needs champion*
 - *Jane/Bill/Dimitry: Chapters 9-11*
 - ❖ *Enrollment form for Standard 217 members? <https://www.ashrae.org/technical-resources/standards-and-guidelines/apply-to-a-project-committee>*
- ❖ Handbook Subcommittee (Salvatore Marsico for Andrew Louie)
 - ❖ *Handbook subcommittee meetings (led by Scott Shi) -- still in review*
- ❖ Webmaster (Fraser Campbell)
 - ❖ Up to date

- ❖ Additional attendees
- ❖ Membership Chair (David Newman)
 - ❖ Update information on website profiles
 - ❖ Provisional corresponding members
 - ❖ Voting members
 - ❖ Check with non-attending members
 - ❖ Promote this committee for new membership
- ❖ New Business and Comments
 - ▮ Progress meetings
 - ▮ Presentation topics – part of TC 5.9 meetings if rejected by ASHRAE
 - ▮ Michael Feuser will take over Research
- ❖ Update profile
- ❖ Next Meeting scheduled for Las Vegas, NV – Tuesday February 3, 2026
- ❖ Adjournment at 4:45 pm.
- ❖ Submitted by Dimitry Kogan, Chair – TC 5.9

TC5.9 PROGRAM SUB-COMMITTEE REPORT

Prepared by Yoon Ko

ASHRAE Annual Conference Phoenix, 20250624

1. Programs for the current meeting Programs:

Paper Session 15: Industrial Ventilation and IAQ (Tue Morning)
Indoor vehicle traffic, storage, and operations for industrial buildings and the impact of alternative propulsion (Presenting Author: Jaimie Handscomb, P.Eng., Stantec Consulting Ltd, Windsor, ON, Canada)

2. Future conferences

	Conference paper abstract due	Seminar, Forum proposal due	Extended Abstract Paper Due
Las Vegas, NV, Jan. 31-Feb. 4, 2026		Friday, August 1, 2025 Call for Programs	
Austin, TX, June 27-July 1, 2026			

Debate - 1 moderator, 60-90 min, 3-4 panelist, in individual presentations

Forum - 1 moderator, 60 minutes, no presentations

Panel -1 moderator, 60-90 minutes, 3-6 participants, no individual presentations

Seminar -2-3 speakers for 60 min or 3-5 speakers for 90 min

Workshop - One chair and two presenters (maximum), 60 min long including 30 min presentation and 30 min discussion

2026 ASHRAE Winter Conference (Las Vegas, NV, Jan. 31-Feb. 4, 2026)

Conference Website: www.ashrae.org/conferences/2026-winter-conference/2026-winter-conference-technical-program

Program Focus at Las Vegas Winter Conference:

Track 1. Fundamentals and Applications

Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychrometrics, heat transfer, and fluid flow. This track provides opportunities for papers and presentations of varying levels across a large topic base. Concepts, design elements and shared experiences for theoretical and applied concepts of HVAC&R design are included.

Track Chair: Kevin Brown | kevin@kbsquared.net

Track 2. HVAC&R Systems and Equipment

HVAC&R Systems and Equipment are constantly evolving to address the changing requirements of the built environment. Papers and programs in this track focus on the development of new systems and equipment, novel applications of existing systems and equipment, improvements to existing systems and equipment and the proper application and operation of systems and equipment.

Track Chair: Ng Yong Kong | nyk@nyk.com.my

Track 3. Refrigeration and Refrigerants

Track Chair: Haotian Liu | sjtulht@hotmail.com

Track 4. Research Summit

Active research, and the exchange of those research findings, are critical to the development of our HVAC&R industry and built environment. This track invites researchers to share those results, including ASHRAE-sponsored research and research of interest to the ASHRAE community. Researchers are invited to present papers, extended abstracts, seminars, forums or participate in panel discussions. The Research Summit includes a partnership with ASHRAE's archival journal, Science and Technology for the Built Environment.

Track Chair: Li Song | lsong@ou.edu

Track 5. Energy Storage and Grid Resiliency

Thermal and electrical energy storage can alleviate the mismatch between renewable energy availability and peak building energy demands, enabling the incorporation of more renewable energy into the grid. Integration of thermal energy storage (TES) with residential and commercial building envelopes or HVAC systems would reduce buildings' heating and cooling loads, level out peak energy demand, reduce HVAC size, increase energy savings, improve occupant thermal comfort and allow flexibility for shedding and shifting electricity demands associated with building loads. These benefits enable improved grid resiliency; thereby, enabling more cost-effective electrification of buildings. Papers and programs in this track focus on advances in cost-effective TES materials and systems, integration of thermal TES in building envelopes or HVAC systems and grid resiliency.

Track Chair: Jon Cohen | joncohen1@gmail.com

Track 6. Pathways to Building Decarbonization

Decarbonization is urgently needed to slow climate change that is affecting the planet. Approximately 10% of global CO₂ emissions is attributable to embodied carbon in building materials and construction processes. Energy use in buildings accounts for about 40% of energy-related carbon emissions.

Therefore, to accomplish building decarbonization goals, accounting for embodied carbon and carbon emissions from operational energy use is essential. ASHRAE and its members are leading the advancement of carbon neutral, net zero energy and decarbonization strategies in new construction, renovation and HVAC&R design for residential and commercial buildings.

This track highlights case studies and research across the globe on the methods being developed and policies being evolved to reduce carbon impacts on the global environment; tools and resources to make zero energy design and operation more easily achievable; innovative low-carbon materials and state-of-the-art technologies and strategies to achieve zero energy communities and campuses; and policies, regulations, codes, standards and utility and government programs for adoption and scale up of net zero (or net positive) energy building and community initiatives.

Track Chair: Ehab Mamdouh | ehab.mamdouh@ipec-eg.net

Track 7. Artificial Intelligence

Artificial intelligence (AI) is being adopted by many aspects in our life. As sensor systems, internet connectivity, building management software and data collection become more sophisticated and ubiquitous, substantial opportunities exist to make buildings and HVAC systems and equipment "smarter." Implementation of AI in building automation and control systems offers the potential to improve operational energy efficiency, occupant comfort, security and maintenance, and to enhance

utilization of renewable energy resources (e.g., wind, solar) and energy storage. Submissions in this track focus on applications for AI and machine learning technology in **building automation and controls** to enhance energy efficiency and comfort, cyber security, fault detection and diagnosis, operation of HVAC systems and equipment for load flexibility, and benefit from time-of-day energy prices.

Track Chair: Joshua Vasudevan | joshuavasudevan2011@gmail.com

Track 8. Indoor environmental quality for Healthy Buildings

Indoor environmental quality (IEQ) is a vital consideration during all phases of a building's life because the indoor environment is closely linked to occupant comfort, satisfaction, productivity, and health. Proper fire and smoke control design is also crucial for protecting building occupants. This track explores the design, operation, and studies of ventilation, air distribution systems, and all IEQ aspects, including noise, vibration, thermal comfort, water quality, and lighting in residential and commercial buildings. Topics include aspects of ventilation and IEQ, such as filtration, changeovers, **best practices for maintainability, fire ratings/dampers, detection and ventilation for toxic gases, operator safety in equipment rooms, OSHA requirements, industrial and hazardous spaces, additional occupant health and safety considerations and new building materials**, lighting methods and best practices, acoustic attenuation and impacts of sound and vibration on human health and productivity, and the impacts of poor source water quality on building occupants and methods to mitigate the risk.

Track Chair: Joe Chow | joe.ashrae@gmail.com

Track 9. Future-Proofing the Built Environment

In the face of **climate change, weather extremes** and energy supply disruptions and shortages, methods for designing, constructing and operating buildings and HVAC&R systems must be resilient and sustainable. In fact, resilience is a highlighted aspect of the current ASHRAE strategic plan. This track highlights innovative technologies and strategies that are evolving across the globe that reimagine our relationship with the built environment now and into the future, including **design strategies for extreme climates and weather, appropriate responses to energy supply disruptions, and how all these factors are tied to resilience and energy conservation efforts.**

Track Chair: Robin Bryant | rbryant@bandiflorida.com

3. TC 5.9 Program topics

- ☐ NEW TOPICS!
- ☐ Underground Parking Garage issues + EV hazards
TC 5.6 is working on a new program and RTAR.
- ☐ AI application to tunnel safety systems
- ☐ Hydrogen vehicle safety issues
- ☐ **Electric bus facilities (added through 20240912 meeting)** [Yoon]
[Yoon] can prepare a proposal to discuss codes/standard gap analyses for BEB EVF fire safety
- ☐ **Thermal comfort- subway stations (Scott Shi)**
- ☐ **Other topics, please contact Yoon Ko <yoon.ko@nrc-cnrc.gc.ca>**

Id	Start time	Completion time	Name1	Affiliation	E-mail	Member (Voting, Corresponding, YEA	Member? (Yes/N	Attendance (In-Person/	International Member?
1	6/24/2025 15:30	6/24/2025 15:30	Eric Li	RWDI	eric.li@rwdi.com	Corresponding	No	Virtual	No
2	6/24/2025 15:30	6/24/2025 15:30	Ryan Danks	RWDI	ryan.danks@rwdi.com	PCM	No	In-Person	No
3	6/24/2025 15:30	6/24/2025 15:31	Yuan Li	Jacobs	yuan.li@jacobs.com	Voting	No	Virtual	No
4	6/24/2025 15:30	6/24/2025 15:31	James Carlin	Pottorff	Jcarlin@pottorff.com	Corresponding	No	In-person	No
5	6/24/2025 15:31	6/24/2025 15:32	Bill Lampkin	Greenheck. Industrial D	Bill.Lampkin@greenheck.com	Corresponding	No	Virtual	No
6	6/24/2025 15:30	6/24/2025 15:32	Jaimie Handscomb	Stantec	jrhandscomb@bell.net	Corresponding	No	In person	Yes
7	6/24/2025 15:31	6/24/2025 15:33	Sal Marsico	WSP USA	salvatore.marsico@wsp.com	Corresponding	No	Virtual	No
8	6/24/2025 15:32	6/24/2025 15:33	Jacob Carr	American Warming & V	jcarr@awv.com	Provisional Corresponding	No	Virtual	No
9	6/24/2025 15:34	6/24/2025 15:34	Jane Miller	Clarage	jmiller@clarage.com	Corresponding	No	in-person	NO
10	6/24/2025 15:33	6/24/2025 15:35	Somesh Bhatia	Mott MacDonald	bhatiasomesh7@gmail.com	Corresponding	No	Virtual	No
11	6/24/2025 15:33	6/24/2025 15:35	Duncan Phyfe	Verdantas	Dphyfe@Verdantas.com	CM	No	In-person	No
12	6/24/2025 15:34	6/24/2025 15:35	Michael	Feuser	Michael.Feuser@flaktgroup.com	Voting	No	In person	No
13	6/24/2025 15:35	6/24/2025 15:35	Vincent Tang	RWDI	vincent.tang@rwdi.com	Corresponding	No	In-Person	No
14	6/24/2025 15:35	6/24/2025 15:36	Yoon Ko	National research Counc	Yoon.ko@nrc-cnrc.gc.ca	Corresponding	No	In person	No
15	6/24/2025 15:35	6/24/2025 15:37	Jenny Wang	Canada Toronto	jenny.wang@metrolinx.com	Corresponding	Yes	Virtual	Yes, from Canada
16	6/24/2025 15:35	6/24/2025 15:37	David Newman	Mott MacDonald	David.newman@mottmac.com	Corresponding	No	In person	No
17	6/24/2025 15:42	6/24/2025 15:43	Fraser Campbell	Halton	fraser.campbell@halton.com	Provisional Corresponding	No	Virtual	No
18	6/24/2025 15:52	6/24/2025 15:54	David Hahm	Mott MacDonald	david.hahm@mottmac.com	Voting	No	In-Person	No
19	6/24/2025 15:56	6/24/2025 15:58	Kingson Andy, Li	The Los Angeles County	lik@metro.net	Provisional corresponding membe	No	Virtual	No
20	6/24/2025 16:12	6/24/2025 16:13	Jenny Wang	Toronto Canada	jenny.wang@metrolinx.com	Corresponding	Yes	Virtual	Yes, from Canada
21	6/24/2025 16:21	6/24/2025 16:23	Natasha de los Rios	Mott MacDonald	natasha.delosrios@mottmac.com	corresponding	No	Virtual	No
22	6/24/2025 16:22	6/24/2025 16:23	Sean Cassady	HNTB Corp	Scassady@hntb.com	Voting	No	Virtual	No
23	6/24/2025 16:50	6/24/2025 16:51	Dimitry Kogan	Port Authority of NY & N	dkogan@panynj.gov	Chair	No	In-Person	No