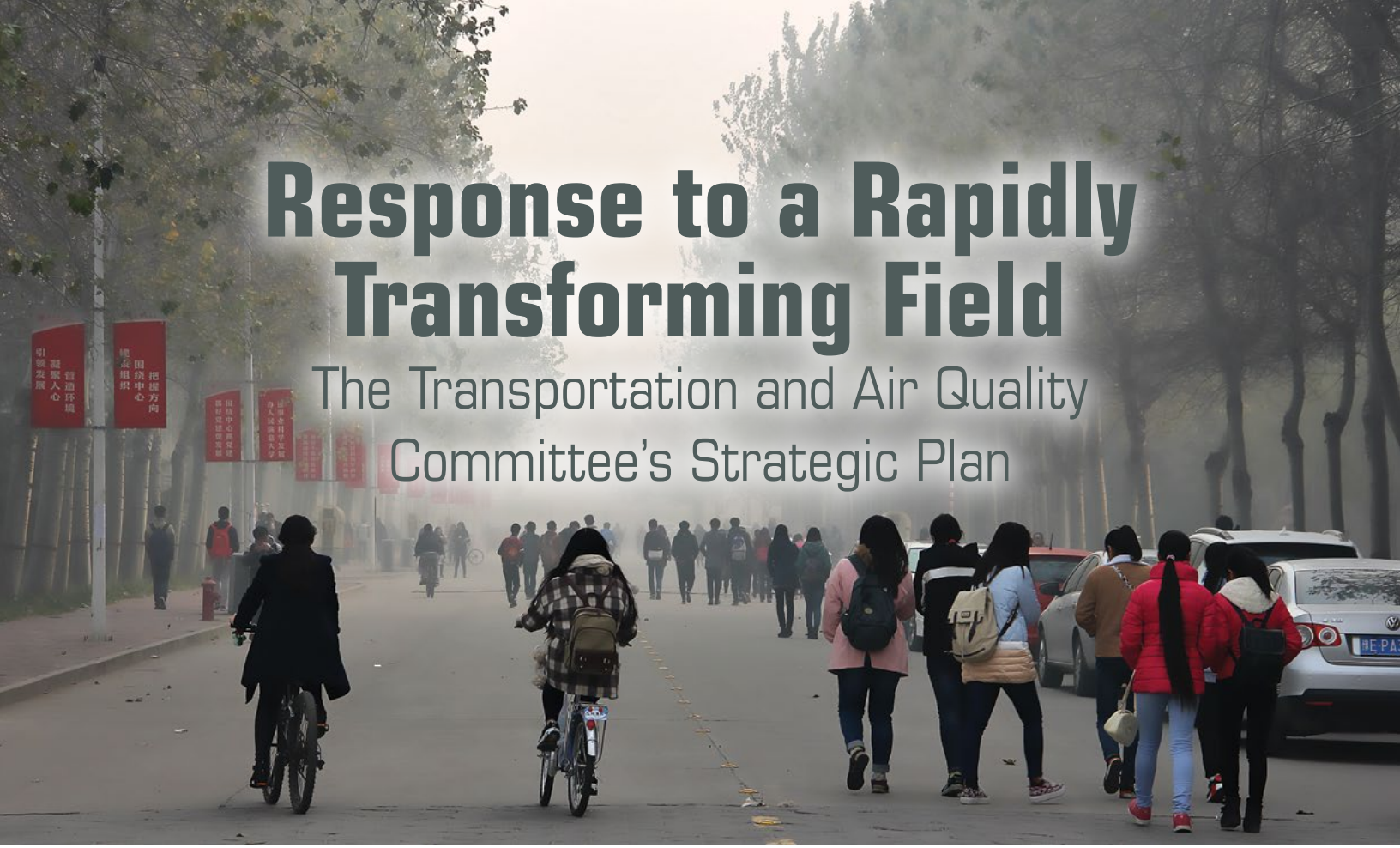
Response to a Rapidly Transforming Field

The Transportation and Air Quality Committee's Strategic Plan



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Above: Rapid motorization has created severe air quality issues in countries like China. TRB's Transportation and Air Quality Committee is responding to these transformations.

The field of transportation air quality is undergoing rapid transformation: from a vehicle perspective, electrification, sharing, and automated vehicles promise swift change in mobility; from an air quality perspective, new, low-cost technologies revolutionize public access of real-time and localized air quality conditions. At the same time, fleet turnover continually reduces per-vehicle emissions and many large metropolitan areas have experienced substantially improved air quality, particularly in the United States and other Western countries.

Greenhouse gas emissions remain well above the levels required to meet the international goals for limiting global warming outlined in the Paris Climate Agreement of 2016, however. Rapid motorization has led to severe air quality problems in developing countries like India and China, and recognition is growing of the health risks of certain pollutants like ultrafine particles.

Meanwhile, disruptive mobility technologies, including electrification, sharing, and automated vehicles, are changing travel. Lower-cost monitoring technologies and improved computational methods such as network and cloud-based computing now allow fine-resolution linked travel, emissions, and dispersion modeling with reasonable run times.

The TRB Standing Committee on Transportation and Air Quality spent much of 2018 considering these transformations and weighing their effect on the information needs of transportation and air quality planning agencies, as well as those of other stakeholders interested in reducing transportation-related air pollution.[1] This article offers a look at the committee's recent efforts and its work planned for the next 3 to 5 years.

[1] For more information on the Standing Committee on Transportation and Air Quality (ADC20) and its work, visit www.trbairquality.org.

Standing Committee Evaluation

TRB hosts more than 200 standing committees. These volunteer committees allow for transportation professionals and students to network with others in the field and stay current on emerging issues, contributing to the continuing evolution of transportation research and practice. Some of the most important activities of TRB committees include:

- Reviewing papers submitted for presentation at the TRB Annual Meeting or publication in the *Transportation Research Record: Journal of the Transportation Research Board;*
- Organizing technical workshops and sessions at the Annual Meeting and at midyear committee meetings; and
- Developing and prioritizing research needs statements and submitting them for funding from TRB Cooperative Research Programs and other sources.

Every 3 years, each standing committee conducts a critical reevaluation of itself, documenting the results in a triennial strategic plan (TSP). The plans' content and process for developing them vary by committee, committee members, and even update cycle. Some updates are routine; others involve a comprehensive look at a committee's mission, membership, and activities.

In 2018, the Transportation and Air Quality Committee conducted a comprehensive self-assessment in preparation for its 2019 TSP update. The committee identifies, stimulates, and disseminates important research related to transportation and air quality, with a scope that covers the full range of relationships between transportation and air quality: regulatory and policy considerations, modeling practices, health effects, new technologies, and transportation management strategies.

The Transportation and Air Quality Committee's latest strategic planning work responds to the rapid transformations taking place in transportation air quality. This article is organized into three sections: 1) a discussion of the strategic planning process; 2) findings from the process, including an action plan for committee activities and priorities; and 3) thoughts on the applicability of the process to other TRB committees.

SWOT analysis breakout group of nongovernmental organizations at the TRB Annual Meeting in January 2018.

Strategic Planning Process

JANUARY 2018

The Transportation and Air Quality Committee began the strategic planning process by conducting a strengths, weaknesses, opportunities, and threats (SWOT) analysis at its regularly scheduled meeting in January 2018, which took place at the TRB 97th Annual Meeting in Washington, D.C. The purpose of the SWOT analysis was to better understand what committee members, friends, and other attendees thought about best committee practices and areas in which meaningful changes could be found.

The meeting divided into three breakout groups; each group represented a different constituency within the transportation air quality community. Participants in one group were predominantly from environmental agencies; a second group was composed of representatives largely from transportation agencies; the final group included representatives from nongovernmental organizations. Each group was assigned a leader, a note taker, and a flip chart, and was asked to think about the Transportation and Air Quality Committee through a SWOT lens:

- **Strengths**. What does the Transportation and Air Quality Committee do really well?
- **Weaknesses**. In what ways can the committee improve?
- **Opportunities**. In what areas should the committee lead on topics, partnerships, and more?
- **Threats**. What can reduce the committee's effectiveness, and what should the response be?

A breakout group representing environmental agencies conducts a SWOT analysis at the January meeting.

TABLE 1 Top Issues in SWOT Analysis Results

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Active, diverse membership	Interaction with other committees	Collaboration with other committees and AQ community	Relevancy because of changes in AQ and technology; overlapping coverage of some topics by other committees
Paper review	Communication	Communications and social media	Low paper quality, weak diversity, lack of academic rigor
Research ideas and funding	Applicability of research to practice	Link research to practitioner's needs	Overemphasis on emissions modeling to the exclusion of other important topics

NOTE: SWOT = strength–weakness–opportunity–threat; AQ = air quality

In total, approximately 100 meeting participants helped the Transportation and Air Quality Committee complete its SWOT exercise. The top three issues in each category are shown in Table 1 (above). For example, although the committee has an active and diverse membership with robust processes for identifying research needs and reviewing papers, its research focus could be broadened and directed more strongly toward the needs of practitioners.

SUMMER 2018

With the SWOT analysis as groundwork, committee members organized a two-day summer meeting at the Keck Center in Washington, D.C., to complete the strategic planning process. The agenda included:

- Presentations on key issues, trends, and hot topics in air quality by some of the field's leading researchers;
- A review of the January 2018 SWOT analysis findings;
- Perspectives and priorities on research needs from industry, government, and research institution partners;
- Breakout sessions to discuss research priorities, the role of the Transportation and Air Quality Committee in pursuing these, and paths for new partnerships; and
- Breakout sessions to develop an action plan and measures of success for the committee.

Before the meeting, representatives of key research partners in the air quality field were asked to prepare statements on the top research priorities of their own organizations. These partners included the Federal Highway Administration (FHWA); the U.S. Department of Energy; the U.S. Environmental Protection Agency; Oak Ridge National Laboratory; the California Air Resources Board; the Health Effects Institute; and the Coordinating Research Council, a group focused on coordination of air quality research between the automotive and fuels industries. Representatives of related TRB committees, including the Transportation Energy Committee and Alternative Transportation Fuels and Technologies Committee, also prepared statements of priorities. During the meeting, approximately 50 transportation air quality experts convened to hear recent insights and contribute to the Transportation and Air Quality Committee's strategic planning efforts.

After the summer 2018 meeting, committee volunteers developed a summary documenting the findings of the gathering

Left: The transportation agencies breakout group at the January meeting considers committee priorities. Right: A breakout group discusses key issues and research needs at the summer meeting.

Understudied Transportation Air Quality Issues

- Health effects and regulatory responses of ultrafine particles;
- Air quality modeling chain: uncertainties, impacts on decision making, model simplification;
- Nonexhaust emissions: brake and tire wear;
- Why ozone levels have plateaued in some areas even as emissions are decreasing;
- Multipollutant hotspot analysis and spatial variability;
- The value of transportation air quality conformity practices; and
- Health effects: communication of risks and comparison with other risk factors and spatial and temporal variations.

Photo: Gillian Thomas, Flickr

United Kingdom's Fawley Power Station shut down in 2013 because of the financial and environmental cost of the oil-powered operation. Although some air quality issues have been addressed, new issues are emerging that need further research.

and included the SWOT analysis as an appendix.[2]

Findings

The changing landscape of transportation air quality research needs was a major theme of both the SWOT analysis and the summer 2018 meeting. Participants noted that, although some air quality issues have been addressed effectively, others are emerging as important areas of further study. Participants also recognized that the air quality issues of today and tomorrow are strongly intertwined with other transportation issues and that traditional sources of research funding for the committee, such as the National Cooperative Highway Research Program, are inadequate to address all current challenges. The action plan that emerged from the summer meeting placed a strong emphasis on partnerships with other committees, as well as coordination of priorities and activities among a diverse set of research partners.

> Practitioners would benefit from simplified approaches that still provide insights into key uncertainties affecting air quality outcomes.

Another theme was the importance of conducting research focused on the needs of practitioners. Although basic research often is important and necessary, applied problems cannot be overlooked. For example, modeling the air quality impacts of transportation investments and strategies can be a complex process, involving a chain of models that starts with transportation activity models and continue with emissions models and air pollutant dispersion models that estimate pollutant concentrations. But agency resources are finite, and sometimes great effort can be expended modeling very small impacts. Practitioners would benefit from simplified approaches that still provide insights into key uncertainties affecting air quality outcomes, with a focus on the information needed for decision-making. Committees such as the Transportation and Air Quality Committee provide an important forum for coordination between researchers and practitioners.

Action Items

The summer 2018 meeting summary identified several specific action items for the Transportation and Air Quality Committee, including the following:

[2] See "The TRB Air Quality Committee (ADC20) 2018 Summer Meeting Summary," available at www.trbairquality.org/the-trb-air-quality-committee-adc20-2018-summer-meeting-summary.

The ADC20 Summer Meeting Final Summary, including SWOT analysis findings, is available at the committee website at www.trbairquality.org.

- Circulating a call for papers in 2019 based on high-priority issues identified at the meeting;
- Expanding liaison and collaboration with other related committees and reviewing their relevant research needs statements to look for overlap and collaboration opportunities;
- Increasing the committee's off-road and nonhighway emissions analysis capabilities through membership, workshops, and focused research needs identification;
- Forming a working group to consider in more depth what the committee can do on international issues; and
- Creating a working group or subcommittee to compile, prioritize, and advance the list of research needs from the summer 2018 meeting by identifying and writing needed new research needs statements and matching these with potential funding sources.

Conclusion

TSPs provide a platform in which TRB committees can regularly reassess their activities and priorities. In preparation for its 2019 plan update, Transportation and Air Quality Committee members felt it was time to take a comprehensive look at the committee's activities and priorities and ensure they were responsive to the changing needs of both researchers and practitioners. A SWOT analysis at the TRB Annual Meeting in January was followed by summer meeting sessions to identify key issues and research needs, the role of the committee in meeting those needs, and future directions and action items. The process resulted in recommendations related to membership considerations; partnerships with other TRB committees and air quality research institutions; and steps to encourage research on priority topics through calls for papers, workshop sessions, and research needs statements.

TSPs provide a platform in which TRB committees can regularly reassess their activities and priorities.

This strategic review process can serve as a model for other TRB committees that wish to conduct comprehensive assessments of their own activities as they prepare to update their TSPs.

Committee chair Douglas Eisinger leads a planning discussion during the 2018 summer meeting.

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Committee Mission

The mission of the Standing Committee on Transportation and Air Quality is to provide leadership in research initiatives and knowledge sharing in the area of transportation related air quality issues. The committee does this by ensuring that up-to-date research needs are maintained, cross-cutting emerging issues are identified, critical issues are addressed in sessions and events, excellence in research is rewarded, and that the committee remains relevant and vibrant.