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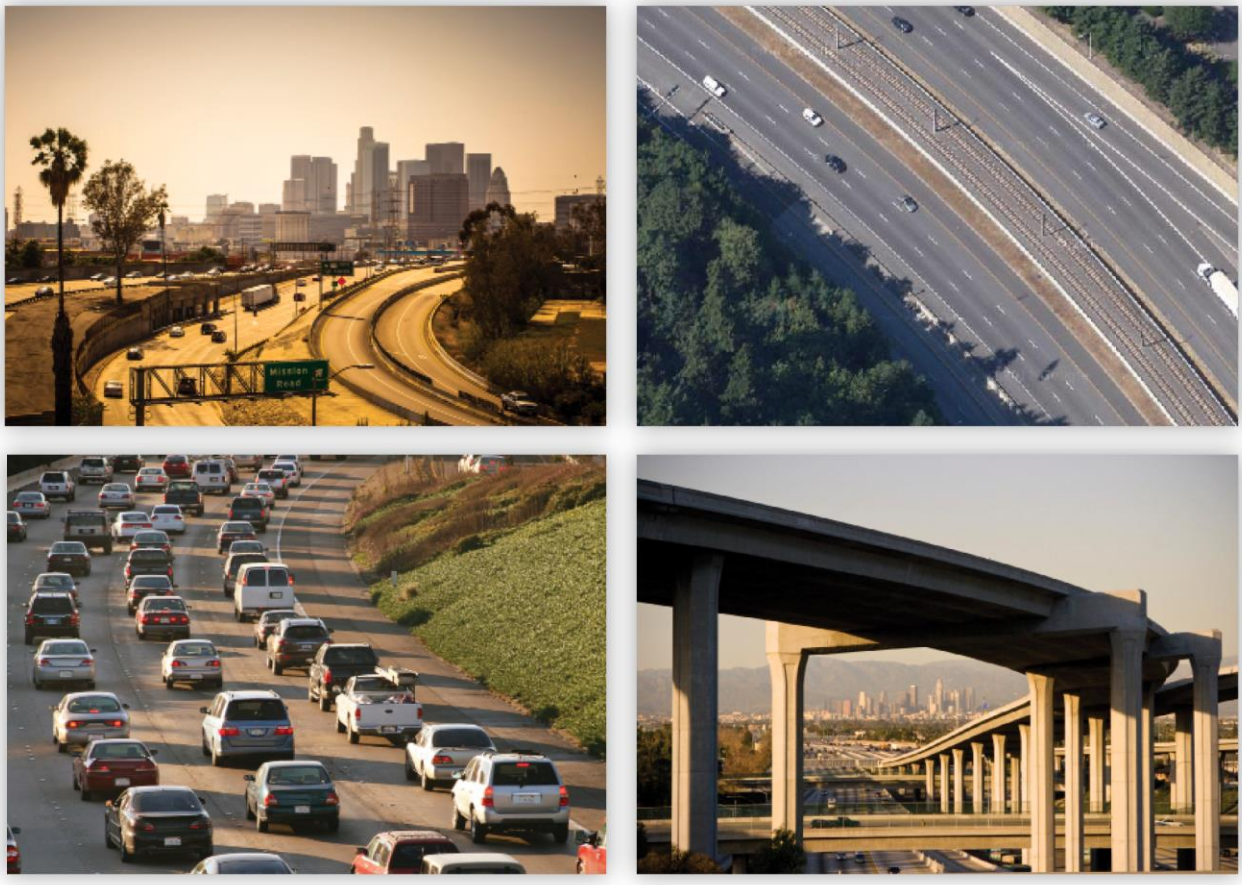
TRB
TRANSPORTATION RESEARCH BOARD

TRB Air Quality and GHG Mitigation Committee (AMS10)

2021 Summer Meeting Summary



August 31, 2021

AMS 10 2021 Summer Meeting Summary Notes **August 31, 2021**

Prepared by Karin Landsberg and Annalisa Schilla

"We need research that is transformational, not just publishable."

Our committee is uniquely positioned to bring together research in accelerating the transition to a cleaner transportation system. One of our strengths is quantifying GHG emissions in the transportation sector. Leveraging this strength in emissions modeling and inventories, we can collaborate with other committees to address the climate challenge as well as transportation air quality.

Because the time is short to address the climate crisis, we need to quickly advance the research policy makers need to support effective decision making. By understanding practitioner's needs and informational gaps, our committee can provide direction on urgent research needs.

The committee recognizes that action needs to start now to have the infrastructure and markets in place for mass adoption of zero emission vehicles in the coming years; research that supports these near-term needs to be identified and given high priority. We also recognize, however, that while part of our focus must be on near-term actions, we must also maintain a long-term focus to facilitate research that supports long-term climate solutions. For example, zero emission vehicles have emissions from power production, but as the grid cleans up, the emissions from these alternatives will improve. The committee needs to take the long-view to best supporting a holistic assessment of transportation-related outcomes.

The first section below summarizes the key topics we identified during our summer meeting that need to be addressed to have an impact moving forward. Headings marked with an asterisk (*) came from Marianne's presentation of research topics. Many of the additions from the summer meeting are refinements and variations on existing topics and themes; some are new additions.

The second section summarizes key actions the committee can take to successfully move research topics forward.

Contents

Summer Meeting Overview

The TRB Air Quality & GHG Mitigation Committee (AMS10) held a mid-year meeting on June 23, 2021 (see inset for agenda), with approximately 40 participants. The meeting focused on strategic planning, and participants were asked to consider two key questions under the umbrella of "What does committee success look like five to ten years from now?"

- What topics should the committee have had an impact on over this period?
- How should the committee have functioned to best achieve its objectives?

Meeting Agenda: 9:00 am to Noon

1. Welcome – Doug Eisinger (Chair, TRB AMS10)
2. "Fireside" chat – Annalisa Schilla (CARB), Moderator; Panelists:
   - *John Hall, Texas Transportation Institute*
   - *Arlyn Purcell, Chair, TRB AVO-30*
   - *Anand Gopal, Hewlett Foundation*
3. Breakout session 1 – Imagine 5-10 years from now, what are key topics we would like to have had an impact in moving forward? *(report out)*
4. Breakout session 2 – Imagine 5-10 years from now, how has the committee functioned to allow us to be successful in moving key research topics forward? *(report out)*
5. Wrap up, next steps, adjourn

To complement the summer meeting's outcomes, On July 8, 2021, Marianne Hatzopoulou, Committee Research Coordinator, provided a summary of research priorities identified by AMS10 during the January 2021 annual meeting and discussed by the committee's leadership team in the months leading up to the summer meeting.

This summary integrates the material developed by Marianne with the outcomes from the summer meeting. Supplemental information is attached as an appendix and includes welcome and wrap-up slides presented at the summer meeting, and research priorities summarized by Marianne in July 2021. Annalisa Schilla (CARB) and Karin Landsberg (Washington State DOT) led the planning and implementation of the summer meeting and developed the summary material presented here.

Key Research Topics

The topics below highlight specific areas of research. At the same time, overarching, comparative analysis is needed to identify the most effective set of technologies to reduce emissions. Asterisks indicate topics identified in Marianne's research priority slides (included as an appendix).

Alternative fuels and vehicles

- The electrification push won't solve everything. How far will it get us? what else do we need? What air quality issues remain?
- Steer away from near-term problems with EV (grid emissions), focus on long-term – how do we get there

Passenger Fleet Electrification*

Key ideas from Marianne's slides:

- State Authority
- Fleet Companies
- Pricing

Research priority from Marianne's slides:

- What suite of policies and strategies at the local, state, and national levels are currently adopted to incentivize EV adoption? How are they working? What else can be done?
- Review of existing strategies and their deployment
- Recommendations for implementation of new strategies

Additions from summer 2021 meeting:

- What incentive programs work?
- How to educate communities about new vehicle technologies?
- What are the costs of electrification? From passenger vehicles to long haul, to grid impacts? How does reducing VMT affect the economics of electrifying transportation?

Freight Electrification*

Key ideas from Marianne's slides:

- Source of power
- Policies
- Technology

Research priority from Marianne's slides:

- Climate and social benefits of reducing diesel exhaust (trucks, marine, rail): air quality, public health, EJ.
- Target the areas mostly affected by diesel exhaust and identify potential for electrification.
- Which policies could accelerate that goal?

Additions from summer 2021 meeting:

- Where is electrification reasonably likely in the coming years? Be careful about assumptions for MD and HD, there are currently no commercial production options available.
- What incentives are needed for MD and HD? What incentives work?

- Role of electricity in all vehicle types and modes: cars, trucks, buses, planes, ships, and trains

Electric Power Generation and On-Road Fleet Electrification*

Key ideas from Marianne's slides:

- Incentives
- Equity
- Battery/Retrofit
- Emissions

Research priority from Marianne's slides:

- Indirect effects of changing the refueling structure: gas stations in small communities, emissions, impact of charging stations on land-use, community fabric
- New policies regarding economic opportunities for gas stations

Fuels*

Key ideas from Marianne's slides:

- Non-highway
- Air quality Impacts
- Infrastructure

Research priority from Marianne's slides:

- Where do we prioritize infrastructure needs to support fleet electrification? And what are the costs and benefits of different EV charging networks? How does the distribution of charging stations in an area affect travel patterns?
- Electrification of off-road/construction and implications for emissions and air quality impacts of construction activities

Additions from summer 2021 meeting:

- Recognize that electrification won't solve everything.
- What are the air quality impacts of liquid biofuels (renewable diesel, gasoline alternatives)?
- What are the best uses of alt fuels and how do those uses affect air quality?

Behavior-based Approaches*

Key ideas from Marianne's slides:

- International perspectives
- COVID

- Equity
- Messaging for driving GHG reductions
- What incentives support the adoption of sustainable fuels? What is needed now, how will that change as the marketplace changes?

Research priority from Marianne's slides:

- Background-local contribution in near-road environments using near-road data during COVID-19
- Examine/collect data on changes in residential location, travel behavior as a response to COVID-19
- Long-term scenarios for land-use/ travel behavior and implications for emissions/air quality/equity:
    - Evaluation of forecasting assumptions and implications
    - How do they affect project-level AQ analysis
    - Performance of EV scenarios under alternative futures
    - Performance of CAV scenarios under alternative futures

Additions from summer 2021 meeting:

- What are the opportunities for transformational behavior changes that would reduce emissions?
- How is travel behavior changing and how do these behavior changes affect emissions?
- Who is benefiting from these emissions changes?
- What can we do to nudge travel choices towards options that reduce emissions as we come out of the pandemic?

Connected and Automated Vehicles*

Key ideas from Marianne's slides:

- Pricing
- Would Autonomous vehicles increase VMT and GHG?
- Personal vehicle ownership
- Equity
- Rural
- Travel behavior analysis
- Data availability
- Broader policy implications

Research priority from Marianne's slides:

- CAV and shared mobility and impacts on GHG emissions/air quality and connections with fuelling/self-fuelling
- Charging needs and networks of charging stations under scenarios of shared electric AVs, and high-mileage implications

Additions from summer 2021 meeting:

- How are emissions changing with automation?
- What kinds of policies will be effective to ensure automation supports GHG reduction?

Shared Mobility*

Key ideas from Marianne's slides:

- Demand and emissions
- Impact of the pandemic
- Shared and electric
- Goods and commercial services
- Vehicle age and type for fleets used by TNCs

Research priority from Marianne's slides:

- Implications of changing land-use/travel behavior induced by COVID on transit and on TNCs potentially replacing transit, and effects on GHG emissions/air quality.
- New approaches to policy analysis in the context of integrated models under rapid social/travel changes and high uncertainty. Energy-emissions-AQ-health outputs under scenarios/uncertainty/sensitivity analysis. New ways of generating scenarios for testing in land-use/ transport/AQ models.
- Challenges of electrification of shared fleets

Additions from summer 2021 meeting:

- What electrification and IT progress and policies would enable the efficient integration of sharing, pooling and transit.
- How can a "clean mile standard" for TNCs support GHG reduction from these services.

Land Use Planning*

Key ideas from Marianne's slides:

- Effects on VMT
- Developing world

- Impacts of automation
- Working/learning from home
- Public participation/community engagement in land use planning
- Integrated mobility pricing and land use planning

Research priority from Marianne's slides:

- Future GHG emissions from rapidly motorizing countries: China, India

Additions from summer 2021 meeting:

- How do we couple decarbonization with better community design to extend benefits of decarbonization?
- How much VMT reduction can we get?
- How much VMT reduction do we need to meet emission reduction targets?
- How close are these two? Do they overlap?
- Significant parts of the country are rural and research needs to address these areas: fewer people, but longer trips. Rural, staying rural and how it is changing? And how does this affect emissions?
- What are the air quality co-benefits of reducing VMT through land use changes?

Economic Tools*

Key ideas from Marianne's slides:

- Incentives for new alternative fuelled vehicles
- Equity
- Incentives for charging vehicle locations
- Tools for different levels of government
- Removing parking minimums

Research priority from Marianne's slides:

- Economic as well as social aspects are integrated within most research priorities

Additions from summer 2021 meeting:

- What are the economic impacts of the policies to reduce emissions? How can we use policies to reduce emissions to address economic disparities?
- Incentives are also critical both for clean vehicle purchases but also to promote pooling and use of transit, how do you incentivize to reduce emissions?

- Quantifying the economic development and job creation benefits of these technologies is needed to build the public support for policies.
- As transportation funding sources change, how do these affect travel behavior and vehicle choices, and thus emissions?
- How can a road use charge (RUC) be used to promote emissions reductions?
- How might fees be used in different areas, perhaps layered (state, local, etc.) to reduce emissions? Both what you are incentivizing/disincentivizing and how you are spending the money to support alternatives.
- How can travel behavior and vehicle choice changes be incentivized by new funding mechanisms? What is effective? What supportive policies are needed to address new equity concerns? Who is benefiting from emission reductions associated with these funding programs?
- Research needs to address equity issues, both the effects of criteria pollutants and the transition to a cleaner transportation system, including the effects on small businesses and small fleets. How to quantify benefits for different populations, communities, etc.

Lifecycle analysis and embodied GHGs*

Key ideas from Marianne's slides:

- Electric vehicles
- Costs and benefits of lifecycle emission reductions
- Lifecycle assessment of infrastructure construction
- Natural gas

Research priority from Marianne's slides:

- New infrastructure or infrastructure renewal and embodied emissions
- How do construction and embodied emissions compare with emission reductions of passenger fleets through electrification?

Additions from summer 2021 meeting:

- How do lifecycle emissions from electric vehicles compare to those from ICE vehicles? (or maybe info is out there?)
- What tools are available to assess the lifecycle emissions from constructing and maintaining transportation infrastructure? What data is needed?
- How might DOTs integrate embodied emission considerations in construction and maintenance decisions?
- What changes in construction methods or materials make the biggest change in lifecycle emissions? What are the biggest opportunities to address lifecycle

emissions in transportation construction projects? What policies are effective to make these changes?

"Traditional" Air Quality

Key ideas from Marianne's slides:

- Strategies
- Health
- Programmatic approach

Research priority from Marianne's slides:

- Scenarios for EV market penetration and impacts on GHG emissions/air quality in local and regional contexts, with particular emphasis on EJ communities.
- What incentives can be put in place to maximize the benefit in areas that need it the most (low-income, high exposure)?
- Compare EV benefits with benefits of travel and traffic management strategies. How can we integrate EV with travel and traffic management strategies to maximize benefits for health, safety, accessibility?
- Characterization (quantification and speciation) of tire and brake wear emissions; impacts of road dust on air quality and health.

Additions from summer 2021 meeting:

Co-benefits of GHG Reduction*

- Quantify the co-benefits of decarbonization pathways
- Non-exhaust emissions – brake wear, tire wear, road wear, road dust – will continue.
- Considerations include the toxicity of non-exhaust emissions, e.g., in WA a compound from tire wear was recently identified that is killing juvenile salmon
- There are tradeoffs between noise, ultrafines, etc.

Near-road impacts & mitigation

- People currently spending time near roadways are affected by near-road air quality, how can we reduce their exposure now, while we wait for the vehicle fleet to turn over?
- How can health impacts from criteria pollutants and air toxics be reduced for those closest to the road (live, school, etc.)? How effective are those mitigation techniques?

- How can geofencing be effectively used to keep trucks out of overburdened areas – rerouting on the basis of pollution levels – minimizing disparate pollution burdens

Equity

- Equity and environmental justice mean different things in different areas and contexts – for example, the EJ population in rural Maine is different than in a urban metro area.
- What policies can help target the adoption and use of EVs in overburdened communities to help address immediate air quality issues? What educational efforts work to inform these communities about the benefits of EVs?
- Recognize that environmental justice and climate justice focused communities have a lot of knowledge about the zero emission technology and regulatory options. These communities are also very ambitious and they speak from the heart about what is needed to address climate and get pollution out of their communities so their children can have a future that is asthma free. What support do these communities need to make the needed changes in their communities?

Topics outside our committee's focus?

- Sustainable aviation fuels (SAF) are promising and there has been quite a bit of research on this but there is only one sustained source of production. What is needed to ramp up SAF production?
- What can be done to reduce emissions at ports (air, rail, marine) – what can be plugged in so that engines don't need to run? What are the biggest contributors to emissions, i.e., how to prioritize implementing changes for the biggest effect?
- How do you structure electricity rates in order to electrify long haul trucking. Load charges, time of day charges?
- How can microgrids, battery storage, and related strategies be used to support transportation electrification? Where are these approaches most helpful?
- Can we assume that cleaning up the grid is being addressed by the utility sector and efforts outside the transportation sector?
- What are the best uses of hydrogen in the transportation sector (and how does that fit with the best uses of hydrogen in the economy as a whole)
- Feedstock sources, regional production, financial feasibility.
- Fuels for aviation, marine, rail.

Committee Function

- Remain flexible to adjust over time as things are moving very quickly
- Work to break down silos (e.g., travel behaviors, fuels, energy, land use, etc.)

Research Needs and Problem Statements

- Develop a research roadmap that identifies research gaps and opportunities.
- Educate committee members and friends on the problem statement review process for NCHRP (i.e., heavily dependent on state DOTs).
- Encourage committee members to propose problem statements, serve on panels, and work as investigators.
- Reinvigorate the spreadsheet of research ideas, expand with new committee focus.
- Identify and understand a variety of funding options, not just what we've done.
- Collaborate with other committees to identify additional funding opportunities.
- Share research need statements with students.

Subcommittees

- Consider joint subcommittees that are co-sponsored with other TRB committees. AMS 10 brings the emissions quantification element to projects, but many of today's critical questions involve expertise outside our committee, as well.

Users of research

- Engage with policy makers. Get the end user of research involved early.
- Make documents available for policy makers and the private sector. Consider other forms or additional avenues for disseminating results beyond technical peer-reviewed journals.
- Policy makers need solid research that informs their decision making, including non-partisan analysis of impacts on consumers and the economy.
- Identify research needs for policies implementation and decision making.

Diversity of researchers

- Need independent and trusted organizations, such as universities and the National Academy of Sciences, to lead objective research to inform policymakers on emission reduction opportunities. Although there is good information coming out of environmental organizations, some view it as subjective.

Diversity, Equity, and Inclusion

- Include discussion of equity topic in every meeting.
- Improve transparency about committee processes
- Seek feedback to make sure being inclusive about getting input.

- Brainstorm about equity, diversity, and inclusion at midyear meeting; integrate DEI into triennial strategic plan.
- Engage of groups who may not traditionally be included.
- Include historically black colleges and universities and others that serve other minorities in research and identifying research needs. Actively seek their participation in committee efforts.
- Encourage researchers to partner with HBCU faculty and students in projects.
- Invite participants from communities that have historically been excluded to events convened by the committee.
- Include more technical expertise in the committee, including traffic engineers, and travel demand modelers, policy analysts, transportation planners, and economists, public health experts, rural/urban reps, among others. younger members, diversity in race and ethnicity, more students, and internationally
- Create opportunities for disproportionately impacted communities to engage with researchers to help identify research needs and transfer knowledge.

Timeliness of research

- Timely research critical - how do we balance the need for peer review and having useful information in the hands of users ASAP.
- Encourage bite-sized research projects that can be done in smaller groups and diversify ways research is done.

Committee as convener

- This committee can be a convener and help connect, e.g., Asilomar. Connecting researchers with knowledge users (policy makers).
- Networking opportunities – break out rooms
- Communicating the results of the research
- Consider developing reports on committee work.
- Co-author circulars.
- Documenting, sharing, and disseminating the important issues.
- Work with other committees: energy, alternative fuels and vehicles, aviation, travel demand modeling, simulation, equity.
- Communicate our mission effectively with other committees.
- Plan joint workshops.
- Work with DOTs and TRB to coordinate research needs. It's helpful to have TRB's assistance in getting DOTs research funding.
- Work with partners: FHWA, Departments of Energy / Environment, local governments, AASHTO / NCHRP and work with federal partners in terms of defining and engaging nontraditional stakeholders

- Engage with a broad array of funding entities so that they know about our subcommittee and its work.

Range of topics

- Solicit more policy related papers and broader ranges of topics, including economics
- Incorporate EJ and climate change issues into past successes (informing emissions modeling and inventory)
- Paper review process: provide information for new reviewers – very intimidating to new reviewer, esp someone not from academia.

Funding and Foundations

- Include foundation representatives in committee activities (speakers, invitations to meetings, conferences, etc.) to share their perspectives and funding process with members and friends.
- Hewlett funded a coalition of folks to support the Advanced Clean Truck rule (basically a ZEV mandate for trucks in California).
- Foundations have lots of appetite for targeted research solutions that help regulators make progress – that's the kind of research that foundations would fund.
- Foundations want to be grounded in the facts, and the facts point to the need for ambitious action. Research needs to communicate what is going to happen both with climate impacts and what is already happening.
- Recognize that foundations are interested in actionable information, the solution side– how to get transport, buildings, everything electrified onto a new different kind of grid with distributed generation and different pricing. Not interested in things like "today we have X emissions, based on the grid emission factors."

Summer meeting Appendix A:

Research priorities for TRB air quality and GHG mitigation committee (AMS10)

July 5, 2021

Topic 1- Passenger Fleet Electrification

Key ideas discussed around the following topics/ applications:

- State Authority
- Fleet Companies
- Pricing

Research priority:

What suite of policies and strategies at the local, state, and national levels are currently adopted to incentivize EV adoption? How are they working? What else can be done?

- Review of existing strategies and their deployment
- Recommendations for implementation of new strategies

Topic 2- Freight Electrification

Key ideas discussed around the following topics/ applications:

- Source of power
- Policies
- Technology

Research priority:

- Climate and social benefits of reducing diesel exhaust (trucks, marine, rail): air quality, public health, EJ.
- Target the areas mostly affected by diesel exhaust and identify potential for electrification.
- Which policies could accelerate that goal?

Topic 3- Electric power generation and on-road fleet electrification

Key ideas discussed around the following topics/ applications:

- Incentives
- Equity
- Battery/Retrofit
- Emissions

Research priority:

- Indirect effects of changing the refueling structure: gas stations in small communities, emissions, impact of charging stations on land-use, community fabric
- New policies regarding economic opportunities for gas stations

Topic 4- Co-benefits

Key ideas discussed around the following topics/ applications:

- Strategies
- Health
- Programmatic approach

Research priority:

- Scenarios for EV market penetration and impacts on GHG emissions/air quality in local and regional contexts, with particular emphasis on EJ communities. What incentives can be put in place to maximize the benefit in areas that need it the most (low-income, high exposure)?
- Compare EV benefits with benefits of travel and traffic management strategies. How can we integrate EV with travel and traffic management strategies to maximize benefits for health, safety, accessibility?
- Characterization (quantification and speciation) of tire and brake wear emissions; impacts of road dust on air quality and health.

Topic 5- Fuels

Key ideas discussed around the following topics/ applications:

- Non-highway
- Air quality Impacts
- Infrastructure

Research priority:

- Where do we prioritize infrastructure needs to support fleet electrification? And what are the costs and benefits of different EV charging networks? How does the distribution of charging stations in an area affect travel patterns?
- Electrification of off-road/construction and implications for emissions and air quality impacts of construction activities

Topic 6- Behavior-based approaches

Key ideas discussed around the following topics/ applications:

- International perspectives
- COVID
- Equity
- Messaging for driving GHG reductions

Research priority:

- Background-local contribution in near-road environments using near-road data during COVID-19
- Examine/collect data on changes in residential location, travel behavior as a response to COVID-19
- Long-term scenarios for land-use/ travel behavior and implications for emissions/air quality/equity:

  Evaluation of forecasting assumptions and implications

  How do they affect project-level AQ analysis

  Performance of EV scenarios under alternative futures

  Performance of CAV scenarios under alternative futures

Topic 7- Economic tools

Key ideas discussed around the following topics/ applications:

- Incentives for new alternative fuelled vehicles
- Equity
- Incentives for charging vehicle locations
- Tools for different levels of government
- Removing parking minimums

Research priority:

Economic as well as social aspects are integrated within most research priorities

Topic 8- Connected and autonomous vehicles

Key ideas discussed around the following topics/ applications:

- Pricing
- Would Autonomous vehicles increase VMT and GHG?
- Personal vehicle ownership
- Equity
- Rural
- Travel behavior analysis
- Data availability
- Broader policy implications

Research priority:

- CAV and shared mobility and impacts on GHG emissions/air quality and connections with fuelling/self-fuelling
- Charging needs and networks of charging stations under scenarios of shared electric AVs, and high-mileage implications

Topic 9- Shared mobility

Key ideas discussed around the following topics/ applications:

- Demand and emissions
- Impact of the pandemic
- Shared and electric
- Goods and commercial services
- Vehicle age and type for fleets used by TNCs

Research priority:

- Implications of changing land-use/travel behaviour induced by COVID on transit and on TNCs potentially replacing transit, and effects on GHG emissions/air quality.
- New approaches to policy analysis in the context of integrated models under rapid social/travel changes and high uncertainty. Energy-emissions-AQ-health outputs under scenarios/uncertainty/sensitivity analysis. New ways of generating scenarios for testing in land-use/ transport/AQ models.
- Challenges of electrification of shared fleets

Topic 10- Land use planning

Key ideas discussed around the following topics/ applications:

- Effects on VMT
- Developing world
- Impacts of automation
- Working/learning from home
- Public participation/community engagement in land use planning
- Integrated mobility pricing and land use planning

Research priority:

Future GHG emissions from rapidly motorizing countries: China, India

Topic 11- Lifecycle analysis and embodied GHG emissions

Key ideas discussed around the following topics/ applications:

- Electric vehicles
- Costs and benefits of lifecycle emission reductions
- Lifecycle assessment of infrastructure construction
- Natural gas

Research priority:

- New infrastructure or infrastructure renewal and embodied emissions
- How do construction and embodied emissions compare with emission reductions of passenger fleets through electrification?

Summer meeting Appendix B:

Welcome and Wrap-Up Slides

June 23, 2021

The National Academies of SCIENCES ENGINEERING MEDICINE

Transportation Research Board

Air Quality & GHG Mitigation Comm. (AMS10)

Summer Meeting Welcome

TRBAirQualityGHG.org

Doug Eisinger, Sonoma Technology, Chair

June 23, 2021

Welcome to our summer meeting!

Whatever your vision of summer is, and wherever you are, welcome!

A few things to get us started…

1. Meeting focus
2. Committee mission
3. Extraordinary challenges
4. Agenda for rest of today

BIG thanks to our organizers!

- Annalisa Schilla, Calif. Air Resources Board
- Karin Landsberg, Washington State DOT
- With invaluable support from Christy Gerencher, TRB

Focus for Today

- Goal: look forward 5-10 years
- Help define: **“What does success look like for our committee?”**

Housekeeping Item

- We are going to record the main meeting room
- The recording is strictly to help check our notes later
- It will not be posted anywhere

Committee Mission Statement (Current)

Our Mission is to provide leadership in research initiatives and knowledge sharing in the area of transportation-related air quality and GHG mitigation issues. AMS10 does this by ensuring that

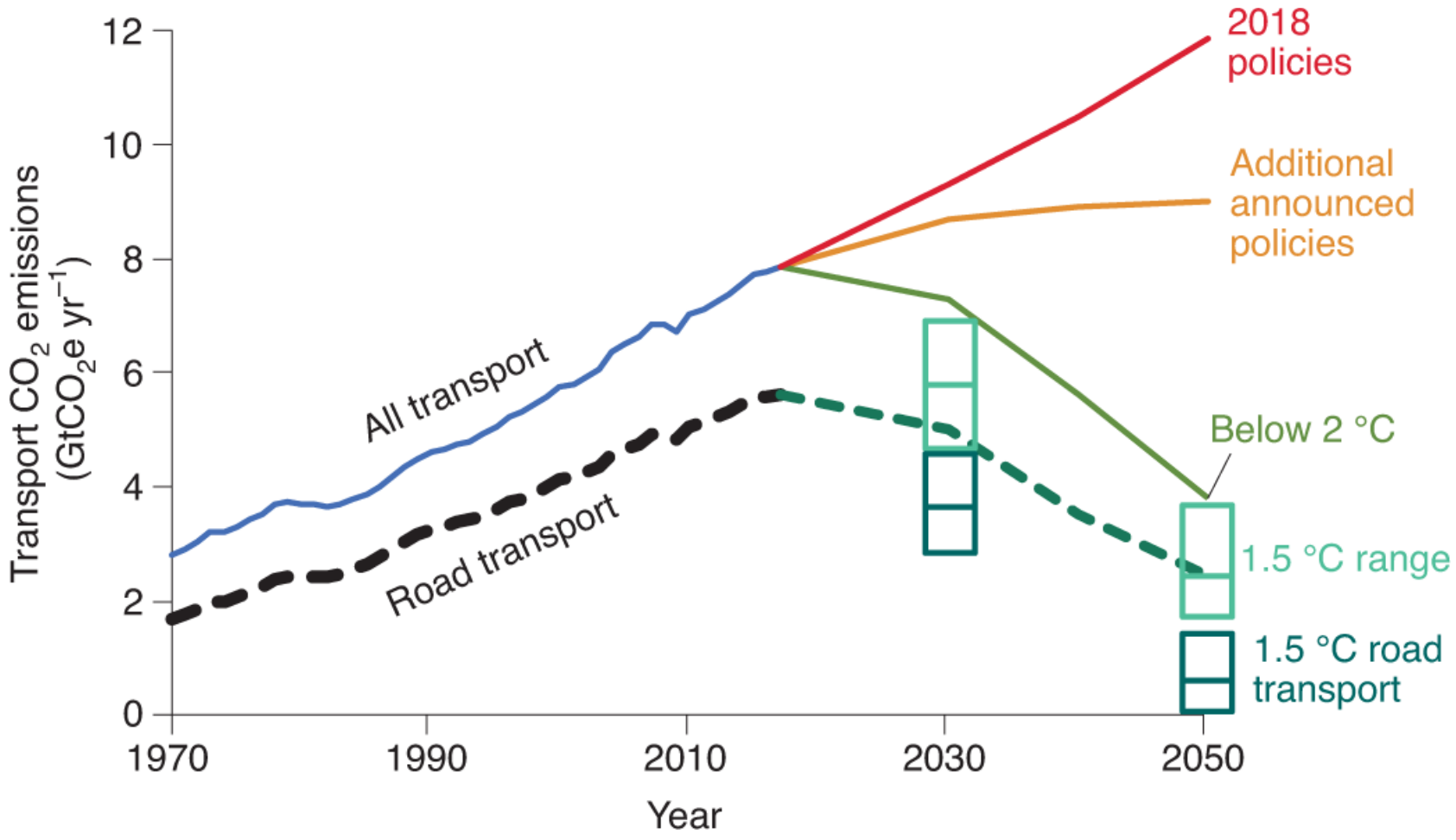
- up-to-date research needs are maintained
- cross-cutting emerging issues are identified
- critical issues are addressed in sessions and events
- excellence in research is rewarded, and
- the committee remains relevant and vibrant

Extraordinary Challenges and Topics to Consider

- **Climate change**: magnitude of needed GHG reductions
- **Equity**: need to equitably address air quality and climate change
- **Information gaps**: need policy-relevant research
- **Impact**: need effective communication of results

Please keep these issues in mind during our discussions today

Climate Change: GHG Reductions Needed by 2050



Source: Axsen et al., 2020, "Crafting strong, integrated policy mixes for deep CO_2 mitigation in road transport," Nature Climate Change

Equity: $PM_{2.5}$ Exposure Example

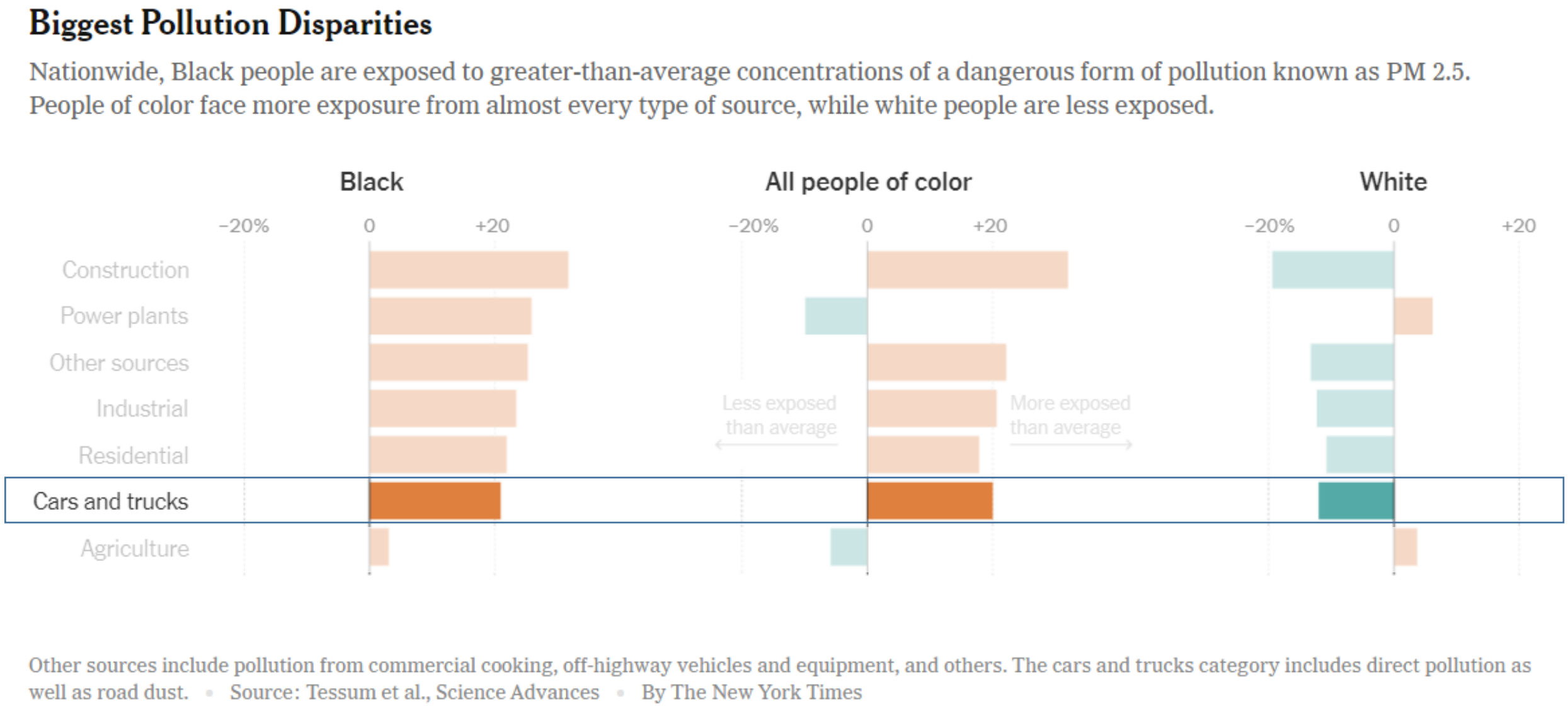
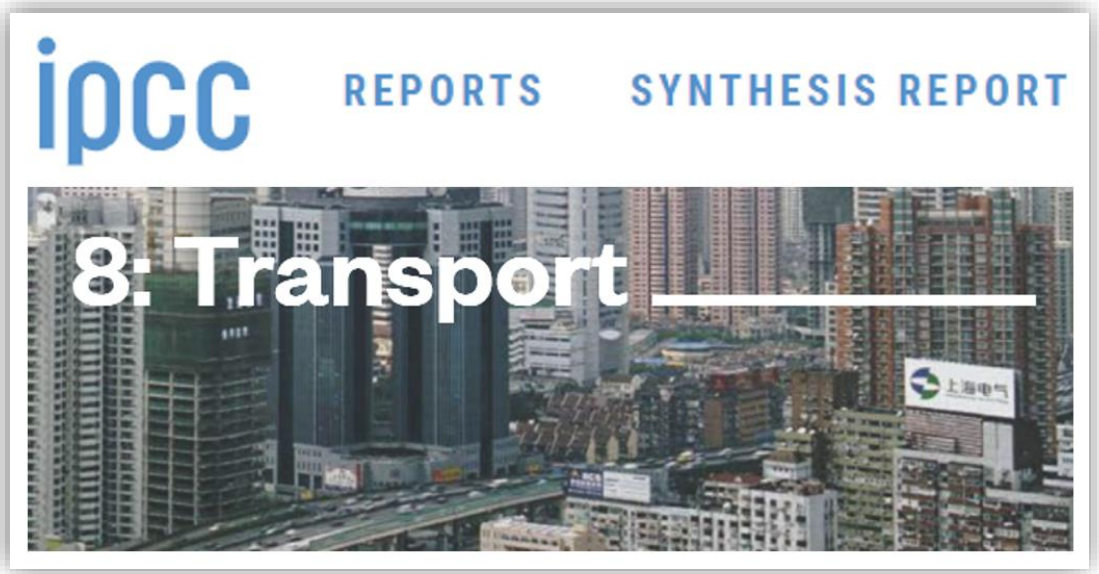


Image source: New York Times, April 28, 2021, citing Tessum et al., 2021, https://advances.sciencemag.org/content/7/18/eabf4491

Information Gaps

"…climate change information is not accessible or applicable to many [local gov't] operational tasks…"

Audience Considerations



"…Gaps in the basic statistics are still evident on the costs and energy consumption of freight transport…"

Technical Topic Considerations

Left Australian Local Gov't Survey, Earth Systems and Climate Change (ESCC) Hub; https://nespclimate.com.au/

Right IPCC Working Group III, 5th Assessment Report, https://www.ipcc.ch/report/ar5/wg3/

Impact

How can we effectively communicate air quality, equity, and climate-related issues?

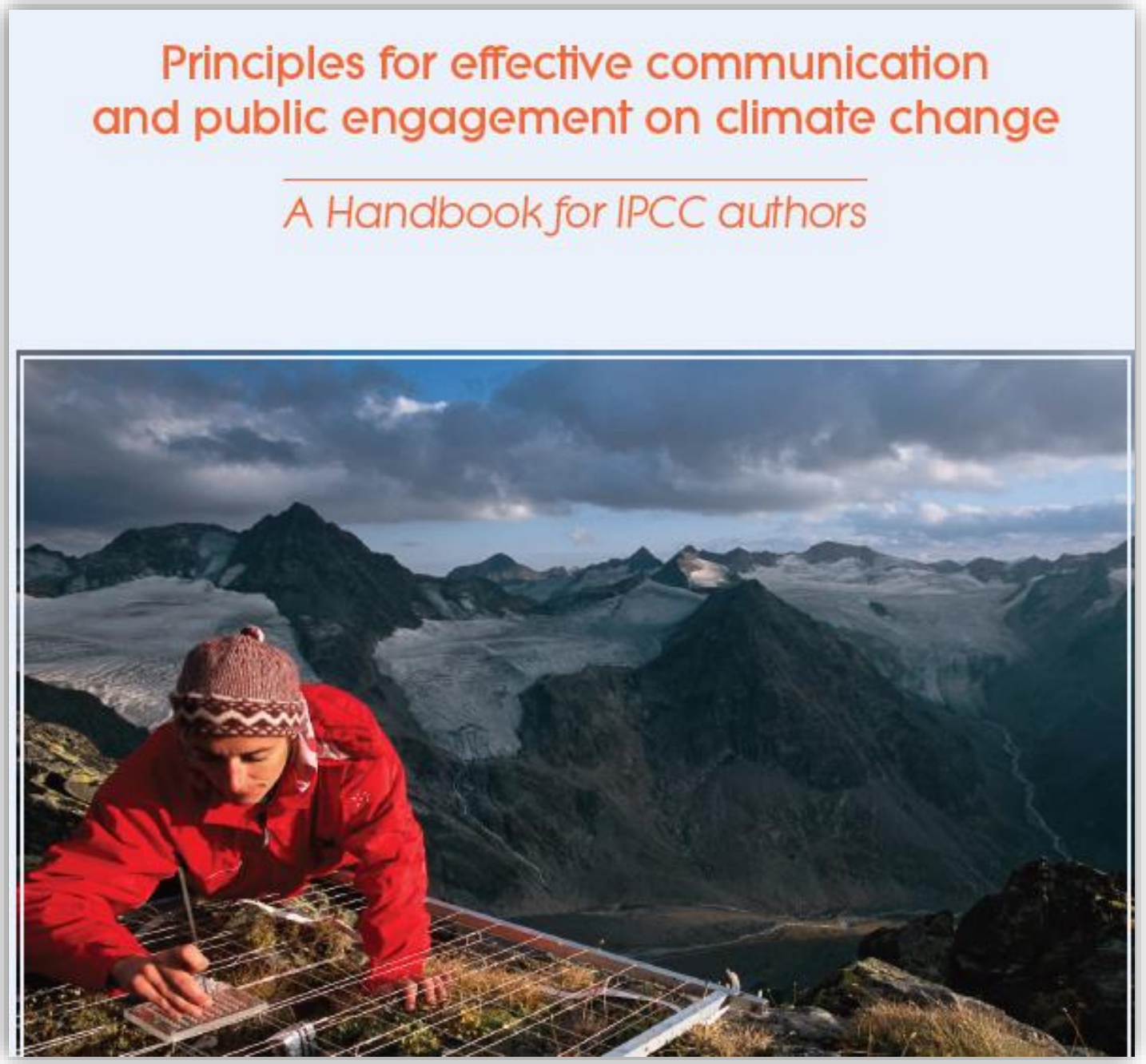


Image source: IPCC, 2018

Agenda for today (with two, 5 to 10-minute breaks)

1. "Fireside Chat" with: **Anand Gopal** (Hewlett Foundation), **John Hall** (TTI), **Arlyn Purcell** (Port of Seattle, TRB Env. Issues in Aviation Comm.), **Annalisa Schilla** (CARB)
2. Breakout 1: what does success look like? (technical issues)
3. Breakout 2: what does success look like? (committee operation)

4. Wrap up

This is also a team building opportunity; meet new people and have fun!

The National Academies of SCIENCES ENGINEERING MEDICINE

Transportation Research Board

Air Quality & GHG Mitigation Comm. (AMS10)

Summer Meeting Wrap Up

Doug Eisinger, Sonoma Technology, Chair

TRBAirQualityGHG.org

June 23, 2021

Fireside Chat: Rough Notes, Impressions

1. Overlapping need: advance fleet electrification, and decarbonization of electricity production
2. Equity needs:
   - Ensure infrastructure work does not damage EJ communities
   - Engage historically black colleges and universities and other institutions serving minorities
   - Diversify comm. membership; "normalize equity"
3. Need to quantify job benefits of moving to ZEV future
4. "Look for research Q's that are transformational, not just publishable" (Anand)

"Fireside Chat" with: **Anand Gopal** (Hewlett Foundation), **John Hall** (TTI), **Arlyn Purcell** (Port of Seattle, TRB Env. Issues in Aviation Comm.), **Annalisa Schilla** (CARB)

Thoughts on AMS10 comm. operations

1. More comm. subcomm's
2. Use of E-circular
3. Research roadmap, published via NCHRP (ACRP for Arlyn's comm)

What Does Success Look Like?

Technical

- Econ impacts/EJ; GHG/AQ overlap; diff. geographies, context (elect. grid not a comm. strength historically) (Ellen Greenberg-practitioner heavy group)
- GHG emissions quantification; break-down GHG/AQ silos; define research needs for policies/decision-making; work with travel demand mgt. comm.; LCA analysis (Max Zhang, diverse group)
- Move needle on GHG mitigation/electrification, beyond what would happen without us taking action; important barriers to ZEVs; EV/VMT connection; LCA; equity/sustainable transition; CAVs/EVs (Chris Porter)
- Near-road health implications, how to address/mitigate (e.g., vegetative barriers); more collaboration between agencies; reach out to younger members; more students, international members (Chris Ramig)
- Work w/ TRB comm's; research to help local, state, federal agencies advance ZEVs, equity; avoid unintended consequences; mitigate new mobility (Roger Wayson)

What Does Success Look Like?

Committee Operations

- Define "right research" (basic vs. applied); timely research; convening role; research roadmap/gaps analysis; leverage comm. friends) (Victoria Martinez)
- Meeting/sharing via reports; solicit more policy-relevant papers; work with AASHTO, NCHRP, non-traditional stakeholders; work w/other TRB comm's; diversify comm. membership (re: disciplines/expertise) (Colleen Turner)
- Community engagement, hear more voices; continue to address AQ needs, add GHG; connect practitioners/researchers (Taylor LaBrecque)
- Work more w/ other TRB comm's; broader array of funders (GHG adds urgency); diversify comm members (re: representation of minorities); successfully manage integration of GHG into comm. (Rick Lattanzio)

Committee Mission Statement (Current)

Our Mission is to provide leadership in research initiatives and knowledge sharing in the area of transportation-related air quality and GHG mitigation issues. AMS10 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
- the committee remains relevant and vibrant

suggestions

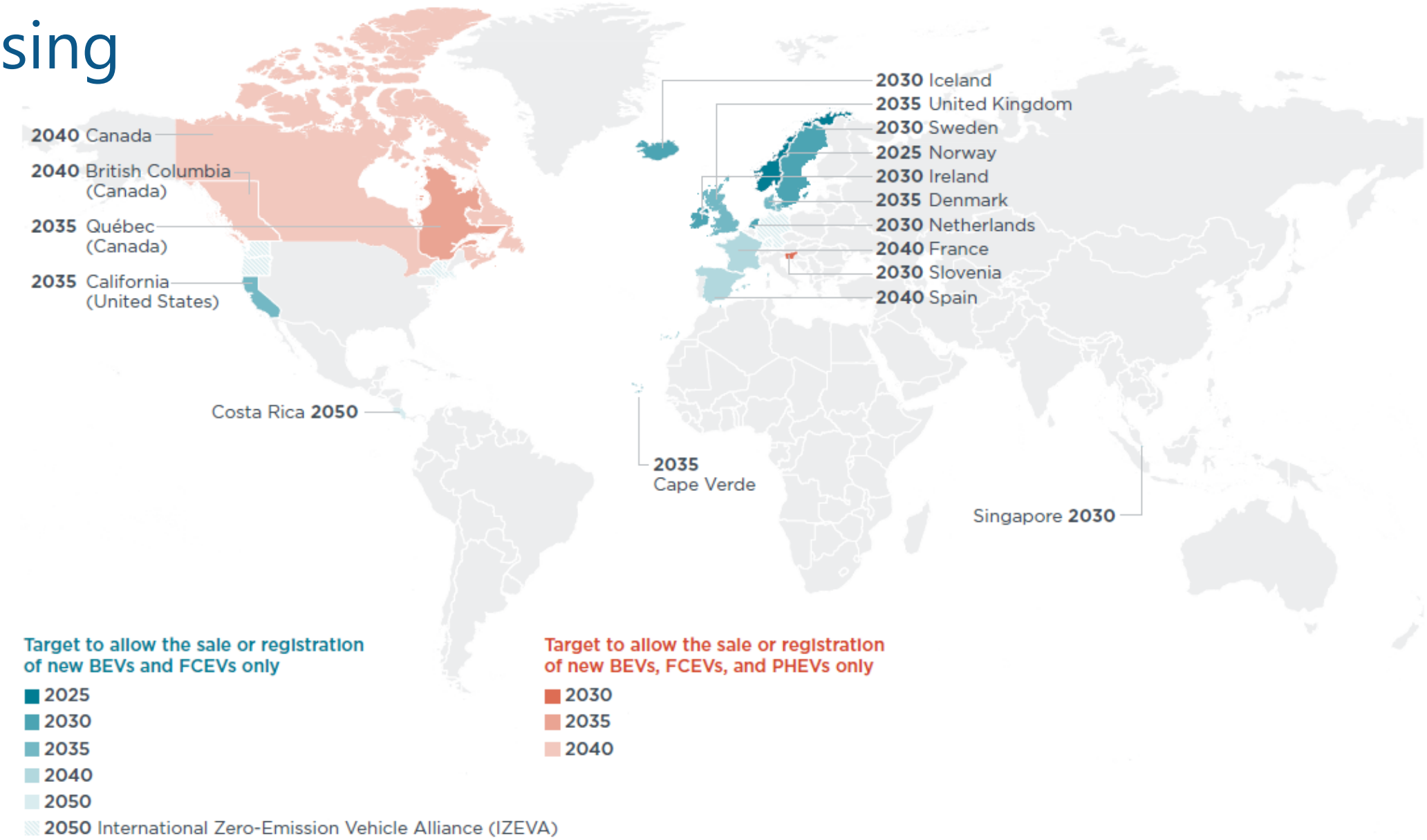
- Work with other comm's
- Move from identification to motivating action
- Impact on communications

How we will use this information…

1. Comm. leadership team will meet to digest, incorporate ideas
2. Insights from today will be summarized and shared with comm.
3. Information will be used to guide thinking on
   - Annual meeting activities
   - Need for upcoming special meetings on focused topics and action items
   - Planned committee actions, and volunteer and leadership opportunities
   - Refines research needs identification and prioritization
   - Mission statement edits, if needed
4. It will also contribute to our thinking on benchmarks we can use to track committee progress over time

Some Closing Thoughts

June 2021 Snapshot: Global Action to Phase-out ICE's



* Includes countries, states, and provinces that have set targets to only allow the sale or registration of new battery electric vehicles (BEVs), fuel cell electric vehicles (FCEVs), and plug-in hybrid electric vehicles (PHEVs). Countries such as Japan with pledges that include hybrid electric vehicles (HEVs) and mild hybrid electric vehicles (MHEVs) are excluded as these vehicles are non plug-in hybrids.

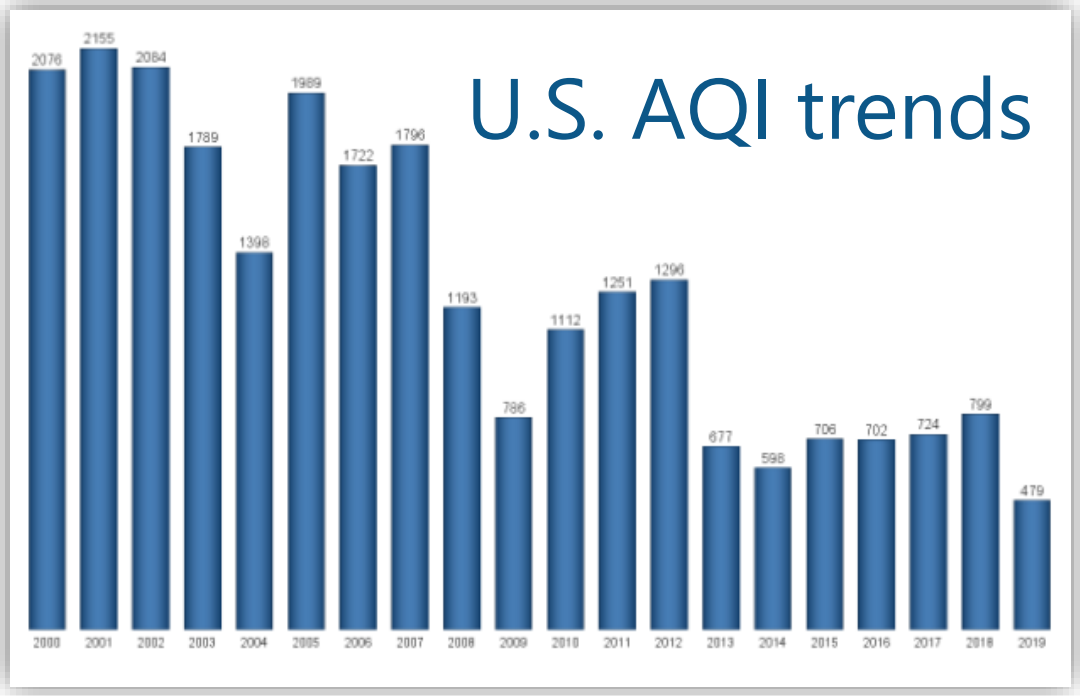
Figure 1. Government targets to 100% phase out the sale or registration of new ICE cars.

Source:

ICCT, 2021

Some Closing Thoughts

- We have reasons to be optimistic
- If we (AMS10) can be strategic and focused… then
- Our committee can make important contributions



Source: EPA Trends Report, 2000-2019, O_3 and $PM_{2.5}$ combined, unhealthy air days

U.S. federal actions (2021)

Thanks for your energy and ideas!

Thanks to our breakout session volunteer leaders:

Round 1

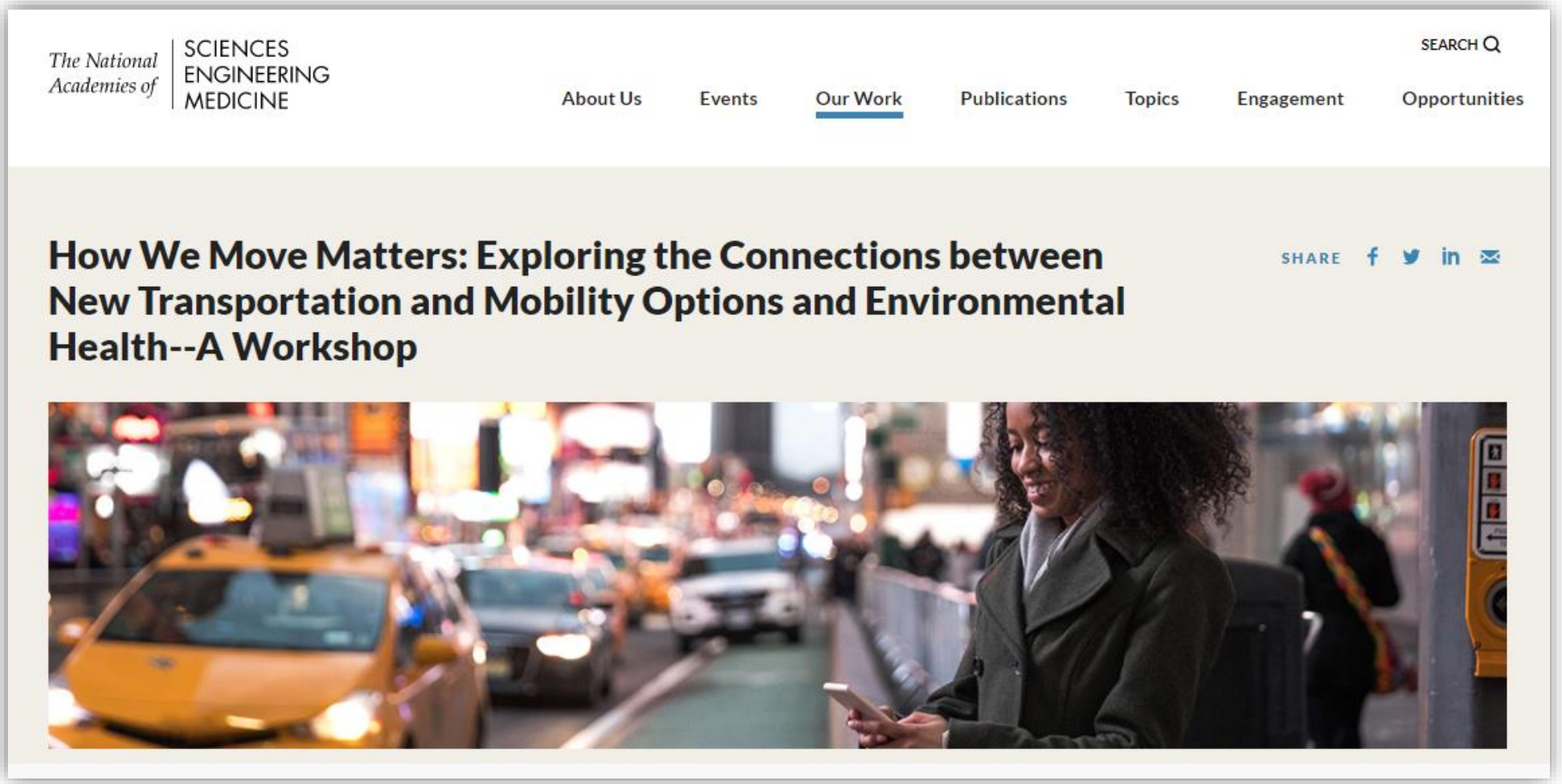
1 – Ellen Greenberg
2 – Max Zhang
3 – Chris Porter
4 – Chris Ramig
5 – Roger Wayson

Round 2

1 – Victoria Martinez
2 – Colleen Turner
3 – Roger Wayson
4 – Taylor Labreque
5 – Rick Lattanzio

And thanks again to our organizers!

And if you liked today's meeting…



Upcoming (free): 13, 16, 21 July 2021. Agenda and registration link below:

https://www.nationalacademies.org/our-work/how-we-move-matters-exploring-the-connections-between-new-transportation-and-mobility-options-and-environmental-health-a-workshop