Truck and Bus Safety Committee
TRB ACS60 Strategic Plan

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As discussed and approved by the members and friends of ACS60 at the 2019 midyear meeting and the 2020 annual meeting

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Introduction:

Motor vehicle crashes are a leading cause of unintentional death and injury in the United States, with approximately 36,500 fatalities and over 2.3 million people injured in motor vehicle crashes in 2018 (U.S. Department of Transportation, 2018). Nearly 13.7 million commercial large trucks and buses were registered in the US in 2017, generating more than 300 billion vehicle miles travelled.[1] Transportation agencies have devoted significant resources to improving safety on the road, including the safety of those who drive a vehicle for commercial purposes.

Road freight transportation represents a long-standing public health and transportation safety problem in the United States. According to the Bureau of Labor Statistics 2018 data[2], the industry sector including transportation has the highest number of fatalities among all goods producing and service providing sectors—truck transportation accounted for 607 of 5,250 occupational injuries in the U.S. in 2018. According to FMCSA's 2017 data, there were an estimated 511,455 large truck- or bus-involved crashes in the United States, resulting in, 5,005 fatalities (13.7% of total highway fatalities) and approximately 170,000 injuries. The magnitude of the problem is likely to worsen given the projected growth in the freight and warehousing sectors in the US, North America, and worldwide (see reports at IBISWorld.com projections for 2030). In the US, long-haul freight truck traffic on the National Highway System is projected to increase from 311 million miles per day in 2015 to 488 million miles per day by 2045[3].

Purpose:

This strategic plan describes the TRB ACS60 Committee on Truck and Bus Safety on three dimensions:

1. Future outlook, directions, and issues
2. Actions to achieve the future direction and address the issues
3. Historic context

The plan will also constitute the Committee's *Triennial Strategic Plan* for Calendar Year 2020.

Audience:

The strategic plan is designed to serve the TRB Committee, the Section, and Group. The Committee is composed of, and serves, four primary groups of practitioners:

- Commercial vehicle operators, including motor carrier companies, owner/operators, drivers, unions, and associations.
- Regulators, including the agencies that monitor system safety and performance.
- Researchers, insurers, safety advocates, and others who use commercial motor vehicle data to assess and improve safety.
- Manufacturers and suppliers of technologies, and others.

[1] Large Truck and Bus Crash Facts 2017, FMCSA 2019.
[2] U.S. Bureau of Labor Statistics website: https://www.bls.gov/iif/oshover.htm
[3] Bureau of Transportation Statistics Freight Transportation System: Extent and Use website https://data.transportation.gov/stories/s/Freight-Transportation-System-Extent-Use/r3vy-npqd

Plan Sections:

1. Future Outlook Statement

This outlook statement is predicated on a planning horizon of approximately 5-7 years. To develop the plan, an ACS60 Strategic Planning Ad-Hoc Working Group was appointed to develop statements from each of our active subcommittees and combine them into a cohesive statement for the entire Committee. This approach allowed us to gather input from our members and friends who participate in multiple activities within the Committee.

Scope of the Committee.

Historically, and going forward, the Truck and Bus Safety Committee considers its domain to focus on the nexus of research. From its start as a working group, the Committee has focused on research related to the safety of large trucks and buses, primarily those operating in long-haul commerce (as opposed to local or municipal transit types of operations). In this strategic plan, the Committee explicitly recognizes the cross-cutting safety issues that are common to all commercial driving situations and proposes to include in our domain research on light-duty commercial vehicles used in shorter-haul/local delivery operations (<5 tons US). This change is being driven primarily by our subcommittees on Safety Management, Technology, and Operator Health and Wellness. The issue was discussed at our 2018 mid-year and 2019 annual meetings of the full Committee. Of particular concern are the safety impacts of work schedules, compensation models, and company risk management practices – all of which are common issues no matter which "market space" a commercial operation inhabits or its core business activity.

1) **Important issues:** This section lists the safety research areas that the Committee and its subcommittees have been already working in, and which we will retain as particular interest areas:

    a. **Crash Causation:** We are interested in the research and methodologies for understanding and effectively addressing the causes of commercial motor vehicle (CMV)-involved crashes.

    b. **Behavioral Safety Management:** The Committee recognizes that behavior at all levels of organizations influence crash outcomes, including driver, dispatcher, manager, and leadership behaviors. We are interested in research on effective strategies to mitigate these impacts and improve safety management practices.

    c. **Risk Management:** The Committee remains focused on how commercial vehicle operations can better manage safety through risk management strategies such as policy, training, and recruitment and selection practices. We are interested in research that can quantify the benefits of specific risk management practices.

    d. **Safety Data for Decision-Making:** The Committee remains concerned with data accuracy, completeness, uniformity, and availability. We work to promote research and best practices in data management and strive to support the data-driven approach to safety management. In particular, we are interested in:

i. Accuracy and consistency of publicly available databases. The maintenance and growth of publicly available databases often result in non- or low-standardized collection when dealing with multiple agencies or operations. Identifying and correcting accuracy or consistency issues within these databases would provide researchers and practitioners with better opportunities for conducting research. This issue is increasingly relevant as technologies for commercial vehicles are developed and implemented.

ii. Collection of accurate driver-related and operational variables. Few data sources provide occupational driver-related variables that can be used in the analysis of modern operational problems. Current information collected on the driver is typically limited to demographics and often difficult to obtain for analysis purposes. Furthermore, many data sources do not adequately capture the full range of factors contributing to crash involvement; rather they tend to be reductionist, focused primarily on driver-level variables, oftentimes neglecting other significant factors that contribute to safety at a systemic level, such as company management, government, and regulatory policies. Some driver data is difficult to obtain in sufficient detail (e.g., accurate and disaggregated age data). Some data is inconsistent across States, making it difficult to create a nationally representative database.

iii. Detailed trip-level data for both trucks and buses using electronic logs and other sources. The collection of trip-level data allows for more flexibility in analytical methodology. Trip-level data provides additional opportunity for exposure data other than miles or hours traveled.

e. **Driver Human Factors:** Another important area of focus for the Committee is on CMV driver human factors:

i. Human factors (inclusive of ergonomics, human engineering, etc.) involves the scientific study of human performance in "systems." In our case, it is the study of commercial driver job performance as it may be impacted by the equipment, technologies, operational procedures, level of training/experience, and policies that commercial vehicle drivers live with every day.

ii. The human factors mission area for the Truck and Bus Safety Committee includes driver functional capabilities, driver selection considerations, driver age and demographic trends, commercial driver training, driver experience, driver work-rest-and-trip scheduling, driver alertness, fatigue and drowsiness, driver interaction with electronic devices, (e.g., cell phones, other communication systems, and map navigational systems), and driver distraction. The human factors area also includes ergonomics design and human engineering considerations of driver compartment design, including driver protection systems and driver performance and health status monitoring systems.

iii. Of contemporary interest are technological innovations that may influence roadway safety, such as automated vehicles and policy changes that may impact safe driver performance, such as the public loosening of restrictions on recreational marijuana use. The testing methods and lack of definitive research linking drug concentrations and impairment are an issue of special interest in the commercial driving situation.

iv. A principal goal of human factors studies of commercial drivers and their crashes is to understand the types of human errors resulting in crashes and the human risk factors that make these errors and crash outcomes more likely.

f. **Occupant Protection:** This area covers improvement of occupant protection for passengers and drivers. This topic includes working to understand the overall high seatbelt usage rates observed in comparison to the large proportion of unbelted drivers in injury and fatal crashes. Is this merely a demonstration that safety belts are effective when used (and it is a poor decision to not use safety belts) or is there more to this in terms of individual choice and safety culture? What is the impact of various strategies aimed at improving safety belt use? Crashworthiness of vehicles (commercial and non-commercial) is another important consideration. Under-ride protection, for example, needs to be examined with careful attention to the design and effectiveness of devices.

g. **Maintenance:** This area examines improvements in vehicle maintenance to reduce vehicle-initiated crashes and understanding the levels-of-maintenance in relation to the age of equipment, size, years in business, financial condition of the operation, etc. We are also interested in the management structures and process controls for completion of maintenance schedules.

h. **Training and Interventions:** Here we look at improving driver skills at all levels (from beginners and especially young driver to those with long experience), health and wellness, and sleep loss issues. We also consider safety management and leadership training to improve safe driving behavior. The impact of safety culture and driver training on overall safety is an important research topic.

i. **Technology:** Introduction of crash avoidance technology, including forward collision warning with active braking and stability control, and lane departure warning systems:
   i. Addition of fire avoidance and fire protection systems.
   ii. Electronically controlled braking systems (ECBS) on air-braked vehicles retain the pneumatic brake actuation at the wheel ends but use electronic signals to manage the operation of the relay valves that control the air pressure to the brake chamber at each wheel. This technology is likely to be needed for semi-automated and automated driving situations (i.e., automated emergency breaking), including platooning.

j. **Roadside Inspections:** Modernizing the roadside safety inspection process for local, state, and federal enforcement agencies is essential when freight traffic is increasing and enforcement resources are lagging; researching ways to modernize and automate roadside inspections is critical. Adding urgency is the looming arrival of more advanced driver assistance and automated driving systems. The US DOT (including FMCSA and NHTSA) and other federal, state, provincial agencies and safety organizations are striving to keep pace with technology innovators already demonstrating driverless concept trucks on public roadways. The Commercial Vehicle Safety Alliance (CVSA), working through its Enforcement and Industry Modernization Committee, has approved an electronic inspection (CVSA Level VIII) -- currently being piloted/developed by federal/state/industry collaborators to modernize inspections of today's CMV — and has established an Automated CMV Working

Group to assess ways to inspect automated trucks. We will monitor the recommendations from this group and related activities.

k. **Commercial Driver Health Research:**

i. General health and wellness: For many health conditions, commercial drivers will typically have a higher incidence than the general driving population. We still don't have answers on the etiology of truck and bus drivers' poor health. Is it the nature of the work or do people predisposed to these conditions select these occupations (or both)? Knowing this answer would significantly impact future interventions. For health conditions and medical certifications among CMV drivers and workers see Sieber et al., 2014[4] and Thiese et al., 2015a[5],b[6]. What is the incidence rate for health issues among drivers? Issues can be diagnosed diseases like diabetes mellitus or cardiovascular disease, symptoms like depression or pain, or associated outcomes like workers compensation claims, medication use, or reasons for job turnover. There is a need for a longitudinal study of driver health in general, and a specific evaluation of the differential effectiveness and timing of exposure to various health interventions. Furthermore, we recognize that many health issues rarely occur in isolation, but exist in a constellation of symptoms, e.g. metabolic syndrome. Knowing the prevalence and incidence of various health issues that occur together would lead to better health management programs for drivers and, presumably, overall better health.

ii. Fatigue and obstructive sleep apnea/sleep disorders: Several recent meetings/discussions have occurred on research gaps and needs in this area. We need to examine industry "resistance" to changes in policy or practices with respect to sleep apnea. Also, what are the policy implications of research findings, in particular with regard to fatigue, sleep apnea, and diabetes. We also need to examine the relationships between hours-of-service rulings and other policies and their health impacts.

iii. Health interventions: Intervention with this population is difficult and we need to design novel ways to reach this population. What are the evidence-based effective interventions that companies and drivers can implement to improve driver health and safety? Knowing the impact of corporate-sponsored programs would help decision-makers promote the most effective interventions within motor carriers.

iv. Older commercial drivers: As the driving population ages, there has been discussion about changing driving practices, obesity, and health status and issues such as fatigue and attentiveness. Intervention to improve the safety, health, and wellbeing of older commercial drivers is also being discussed as research as this area matures.

v. Young commercial drivers: As younger, sometimes novice, drivers enter the commercial driver workforce, research into the best ways to train these new drivers for a lifetime of safety and maintained health will be important.

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[4] Sieber, W.K., Robinson, C.F., Birdsey, J., Chen, G.X., Hitchcock, E.M., Lincoln, J.E., Nakata, A., and Sweeney, M.H. (2014). Obesity and other risk factors: The national survey of U.S. long-haul truck driver health and injury. American Journal of Industrial Medicine, 57(6), 615-626.

[5] Thiese, M.S., Moffitt, G., Hanowski, R.J., Kales, S.N., Porter, R.J., and Hegmann, K.T. (2015a). Commercial driver medical examinations: Prevalence of obesity, comorbidities, and certification outcomes. Journal of Occupational and Environmental Medicine, 57(6), 659-665.

[6] Thiese, M.S., Moffitt, G., Hanowski, R.J., Kales, S.N., Porter, R.J., and Hegmann, K.T. (2015b). Repeated cross-sectional assessment of commercial truck driver health. Journal of Occupational and Environmental Medicine, 6(2), 104-112.

vi. Working environment and culture: The work organization and safety culture have impacts on choices (e.g., food choices) and safety-related behavior (e.g., belt use). Safety is affected by working rules and policies, and even the payment methods (by the mile versus by the load).

2) **Emerging Issues:** This section lists interest areas that were not previously part of our Committee's activities, but which our members see as important for us to consider in the coming years. Our scan of the related TRB committees has revealed some cross-cutting interests shared with other committees (e.g., in the area of automated vehicle operations) and some that we believe are not currently addressed anywhere within the TRB committee structure. We propose to cooperate and coordinate with other committees and communities interested in these issues and, where needed, to take the lead on those issues that do not already have a designated home within TRB.

a. **Voluntary Safety Standards:** The Committee has begun discussions of what an industry-led safety regulation process might look like in CMV operations. This could be similar to the way the FAA regulates air carriers using an industry-led process and trusted providers. Additionally, automated vehicles face the issue of voluntary performance standards and performance measures for vehicle control technologies such as automatic emergency braking (AEB) and automatic emergency steering (AES), which are important for safe AV operation. Given the contents of NHTSA's AV 3.0, how could TRB contribute to the national discussion about the use of voluntary standards, most of which do not include any pass/fail criteria? On what basis will safe vehicle operation be defined quantitatively?

b. **Automated Commercial Vehicles:** The role of automated vehicles in commercial vehicle operations. Long-haul trucking and motorcoach transportation are of immediate importance. We are also interested in safety factors related to high-occupancy, low-speed vehicles, and automated vehicles in local operations. Multiple research topics are of interest including platooning, impacts on hours-of-service regulations, as well as methods of documenting safety benefits/disbenefits at each level of automation. Several of ACS60's subcommittees are also interested in the research on specific impacts of adoption of automation.

c. **Light-Duty Vehicles/Local Operations:** Expansion of the vehicle type scope of the Committee and subcommittees to include light-duty and local operations that share cross-cutting issues with our original domain. This is another issue of international significance and is of interest to several of ACS60's subcommittees.

3) **Cross-Cutting Issues:** This section lists the issues that ACS60 works on, or would like to work on, which are part of the domain of other TRB committees.

a. **Occupant Protection:** Improving occupant protection for passengers and drivers. Understand why the use of restraints, when available, is so low, and what can be done to improve usage, including employing primary enforcement tools. (Cooperative with Occupant Protection Committee – ANB45). ACS60 is also interested in crashworthiness of commercial and non-commercial vehicles.

b. **Automated Commercial Vehicles:** This is a "hot topic" in TRB and there are a large number of committees interested in it. Our contribution is specific to commercial motor vehicle operations. However, it must be recognized that this market segment is likely to be among the first to see major deployments of the most advanced technologies — ranging from advanced driver assistance systems that monitor the roadway and help steer, accelerate, and brake for the driver to more highly automated operations, the full spectrum of which need human factors considerations. We believe we have a strong role to play in reviewing and identifying research needs.

c. **Older Drivers:** There are TRB committees that address driver age as a specific factor in crashes. The older CMV driver population is one that we are especially interested in because of the specific circumstances of commercial drivers who either come into the profession at a late age or who continue to drive into their later years (and who may need specific types of training or accommodations in order to maintain safe operation). ACS60's Driver Training Subcommittee is no longer active; however, it was previously a shared subcommittee with the TRB Committee on Safe Mobility of Older Persons (ANB60). We are interested in renewing that liaison relationship whether or not we reactivate the training subcommittee. A podium session on Older Commercial Drivers was conducted at TRB2018.

d. **Roadway and Traffic Design and Maintenance.** ACS60 reviews a selection of a papers each year that include an infrastructure or traffic device focus as it relates to truck or bus safety. We are interested in working with TRB committees that focus on these issues to help practitioners understand the safety implications of various design alternatives and how they affect large commercial vehicle safety.

The following are listed as coordination issues within the ACS60 Subcommittees. They may also include or be related to coordination with other Committees beyond ACS60.

e. Issues on Which ACS60 Subcommittees Will Coordinate:

i. Improving vehicle maintenance to reduce vehicle-initiated crashes and understanding level of maintenance as related to the age of equipment, size, years in business and financial condition of the operation. This issue includes management practices, as well as the direct maintenance practices.
ii. Improving driver skills, health, and sleep loss issues.
iii. Light-duty vehicle operations and safety.

Committee Liaison and Outreach

This section presents a table of existing relationships and possible extensions to our list of liaison relationships with other TRB committees.

ACS60 Potential Liaison with Other Standing Committees

Committee Name	Code*	Major Focus
Statistical Methods	ABJ80	Foster understanding and use of statistics through dissemination and education activities; and will identify and foster research needed in statistics for use in transportation.
Transportation Safety Management Systems	ANB10	Concerned with the development and coordination of integrated safety management programs to reduce death and injury on transportation systems. Areas of concern include: 1) the advancement of safety management systems, 2) research and technology to improve safety, and 3) models of safety delivery systems
Safety Data, Analysis and Evaluation committee	ANB20	Collection, maintenance and use of crash records and related highway, driver, and vehicle data; the development of theories, analytical techniques, and evaluation methodologies for improving the understanding of highway safety; and the application of these theories, techniques, and methods to identify driver, vehicle and/or roadway-based treatments that will enhance the safety of the transportation system.
Low-Volume Roads	AFB30	Low-volume roads including planning, design, construction, safety, maintenance, operations, environmental, and social issues.
Operational Effects of Geometric Design	AHB65	Geometric design as related to traffic operations and safety.
Transportation Law	AL010	Commercial and private motor vehicles, the transportation of hazardous materials, multimodal transport of goods, interstate and international commerce, and highway safety and traffic control. The committee provides a forum for the discussion and encouragement of research on the balancing of economic efficiency, safety, and other concerns regarding these matters. The committee will also focus on legal issues related to private investment in public transportation systems, including public finance, public/private partnerships, privately financed toll facilities and the like.
Transit Management and Performance	AP010	Transit management actions and performance through the analysis and development of management techniques, identification of appropriate performance measures and their application for improvement of information for transit management decision-making.
Intermodal Freight Transport	AT045	Intermodal freight transport includes all shipments that employ more than one mode in a single through movement from origin to destination; local pick-up and delivery by truck for others not included. Consideration of rates, routes, services, transfer

		facilities, containers, and other items that impact the movement of freight in intermodal transport are included.
Truck Size and Weight	AT055	The social, economic, and political factors related to truck size and weight; the interrelationships of larger loads with pavements, shoulders, structures, facility capacity, safety, and the environment; and the effects of changing vehicle dimensions on carrier and highway economics, on other modes of freight transport, and on labor and management.
Trucking Industry Research	AT060	Business economics, truck operations, supply chain logistics, shipper/carrier/consignee issues, and labor market and human resource issues
Transportation of Hazardous Materials	AT040	Risk management process development; type and extent of hazards associated with materials shipments; conditions and forces encountered during transportation of hazardous materials; consequences associated with hazardous materials transport incidents; legal and regulatory controls affecting hazardous materials; support and training for state and local hazardous materials transportation and emergency response personnel; sources of information to support analysis, planning and response; tools and technology to support risk assessment; and risk communication
Freight Transportation Data	ABJ90	Data on commodity movements, international trade, freight transportation activity, and the economics and organization of establishments engaged in freight transportation; to advise data collection agencies on cost-effective means of fulfilling essential data needs; and to assist analysts and decision makers in the effective use of freight transportation
Freight Transportation Planning and Logistics	AT015	Demand for freight services, the operating costs incurred in transporting freight, the type, quality, and quantity of demand for current and future freight service, and the various factors that affect the selection of modal alternatives for the movement of freight.
Urban Freight Transportation	AT025	Research of urban freight transportation topics and issues, including urban transportation system demand and economic relationships, right-of-way issues, pick-up and delivery needs, terminal transportation needs, institutional challenges, and new technology, with an emphasis on providing support to practitioners.
Occupant Protection	ANB45	Research of available and future technology and the use of this technology to improve protection for all occupants of commercial vehicles from single occupant commercial vehicles to high occupancy passenger buses. Protective methods include both passive and active systems.
Alcohol, Other Drugs, and Transportation	ANB50	Alcohol and other drugs as they relate to all significant modes of transportation with particular emphasis on those relationships that are common to more than one mode.

Social and Economic Factors of Transportation	ADD20	Identifying emerging, critical, and cross-cutting social/economic issues as they arise and programming TRB and/or research activities accordingly. The committee's broad mission allows ADD20 to be extremely relevant for liaison and collaboration with a host of more issue-specific TRB committees. To this end, ADD20 seeks to encourage basic transportation research through its rigorous peer review of technical papers submitted for publication in association with the TRB annual meeting, as well as practitioner-oriented research through its subcommittee on Community Impacts Assessment.
Transportation Energy	ADC70	Energy efficiency and energy use in passenger and freight transportation and the resulting impacts on energy consumption, energy security, greenhouse gas emissions, and related public concerns.
Freight Transportation Economics	AT010	Research pertaining to domestic and international surface freight transportation economics and regulation. Consideration will be given to research into the impact of regulation on social, public, and private costs and benefits; among the various modes; on regulated vis-à-vis unregulated carriers; and on technological change.
Task Force on Transit Safety and Security	AP018T	Research, methods, practices, data, and technologies important to the topic of public transportation system safety and security as they affect all modes and phases of infrastructure development and service operation. Research efforts initiated through the Task Force foster the development and professional growth of practitioners and researchers in the field of transit safety management, application, and research.
Vehicle-Highway Automation	AHB30	Development, application, and operation of driver assistance and automated control to the vehicle and highway system. The scope includes all forms and levels of control ranging from driver assistance systems operating on existing streets and highways to full vehicle control systems operating on freeway type and/or dedicated lane facilities. It further includes systems that support specialized highway-related functions including maintenance, fleet operations, and similar applications. The emphasis is on control systems that will enhance user safety, system efficiency, and operational performance while providing for increased convenience and trip quality to the highway user. The objectives of the committee are to provide a focus and forum within the TRB for vehicle-highway automation and to promote a better understanding within the transportation profession of these systems including their research, deployment, and operation.

Source: TRB standing committee objectives and purpose obtained from TRB website.
*Committee numbers and names are based on status as of 2019. The planned TRB committee reorganization will require an update to this table.

2. Actions to Achieve the Plan

In this section, we have adapted the TRB Safety and System Group strategic planning guidance. One change is that we moved the "emerging issues" and "cross-cutting" discussions into the first section of the plan (see Item #2 in the preceding section). These seem to fit better under what the future Committee (and subcommittees) will look like. That allows us to use this section specifically for implementation. The items listed came from the multiple subcommittees and the members and friends of the Committee in their review in late 2019.

Subcommittee Strategic Actions

1) **Subcommittee Actions:**
   a. **Fatigue and Driver Health:** The Health and Wellness Subcommittee would like to help address findings and recommendations included in the recent report (2016) from the National Academies of Sciences on Fatigue and Long-Term Driver Health: Research Needs.
   b. **Light-Duty/Local Operations:** A workshop is scheduled for TRB2020. The Committee is interested in special-topic poster sessions on the safety of drivers (and passengers) in light-duty vehicles used in local or regional deliveries and for-hire passenger services (taxis and ride services).
   c. **Driver Human Factors:** The Health and Wellness Subcommittee suggests that the consideration of human error and health will be important for future research in truck and bus crash causation and in the search for effective countermeasures.

2) **Subcommittee Participation:**
   a. Would like to see some representation of industry research, particularly evaluations to support evidence of "best practice."
   b. The Safety Management Subcommittee will seek to include employers in the light-duty and ride service market segments. Our 2019 Annual meeting included a representative from Uber and we will seek others from this area as well.

Committee-Level Strategic Actions

1) **Promoting Research:** ACS60 has a large and growing library of research need statements (RNS). We have an organized approach to RNS creation and vetting, and we have taken advantage of the various cooperative research programs relevant to our key issues. The Committee is exploring additional ways that we can impact the research community, given that the cooperative research program specifically targeted at truck and bus safety was canceled some years ago. We are also exploring the best ways to transfer research results and get them into the hands of users/practitioners who can make operational changes. In doing this, our focus will be on identifying examples of translational research.

2) **Webinars:** The Technology Subcommittee has expressed interest in hosting a webinar to share background information and open up for discussion on new rulemaking topics. This is especially relevant with respect to U.S. Government regulations of interstate commercial motor vehicles; however, we would like to keep the discussion open to consideration of issues that are relevant, and can be informed by, practices, laws, and policies from all countries. We would like to facilitate an opportunity to understand the purpose of rulemakings and help industry, researchers, and regulators discuss the technology, testing, and enforcement of new

technology. The Data Subcommittee has proposed creating webinars on public data availability, capabilities, and limitations.

3) **Q&A Forum:** The Committee has discussed developing an online forum where interested parties could discuss and interact on issues of interest to ACS60 and its broader audience. Topics could include data quality issues and solutions, health and wellness, carrier safety management, technology, etc.

4) **Response to NAS Research Report:** The Committee can help address findings and recommendation included in the recent report (2016) from the National Academies of Sciences titled *Commercial Motor Vehicle Driver Fatigue, Long-Term Health, and Highway Safety: Research Needs*[7].

5) **Automated Commercial Vehicles:** The Committee seeks to engage on the following research topics:
    a. Safe testing and deployment of driverless trucks on roadways
    b. Safety for vulnerable road users in urban operation
    c. Connected: V2V and V2I
    d. Wireless inspections: Self-testing and status of sensors and safety systems (brake system performance, tire inflation, required lighting, radars, lidars, cameras, others).

6) **Driver Training Effectiveness:** The Committee is interested in summarizing and promoting research in commercial driver training (including training for novice drivers) and its documented impact on safety. This is an ongoing interest of the Committee which we will pursue along with other research interests through the RNS process. We hope to explore other ways to encourage dialogue on this topic in the research community. Identifying examples of "best practice" from industry will help facilitate this agenda.

7) **Workers' Compensation Insurance and Claims:** The Committee notes that there is a lack of research on costs and the interaction between costs and specific safety program designs with respect to lost time and insurance payments for driver injury claims. We are also interested in promoting research on injury prevention as a complement to our focus on crash causes.

[7] National Academies of Sciences, Engineering, and Medicine. 2016. *Commercial Motor Vehicle Driver Fatigue, Long-Term Health, and Highway Safety: Research Needs*. Washington, DC: The National Academies Press. https://doi.org/10.17226/21921.

3. Committee History

In Calendar Year 2000, at the request of the TRB Standing Committee on Transportation Safety Management (ANB10), a Task Force on Truck and Bus Safety was established. ANB10 had advocated for the establishment of this task force because no single TRB committee, at that time, focused solely on commercial carrier safety – even though nearly 25 different entities within TRB grappled with interweaving elements of commercial vehicle transportation. One consequence of this decentralized treatment of commercial vehicle research was that there were significant gaps in coverage of important issues. Truck and bus safety, as a discipline, was growing increasingly prominent, and the safe operation of commercial vehicles was clearly integral to overall safety fitness on the nation's roadways.

Over a period of several years, the task force, consistent with its mandate, evaluated the need for a permanent standing committee that would focus specifically on truck and bus safety. Task force members met with pertinent TRB committees and convened additional information-gathering sessions during TRB annual meetings. Ultimately, a recommendation was made to TRB to establish a permanent standing committee.

In 2003, the Committee on Truck and Bus Safety (ACS60) was created. Within the TRB committee structure, ACS60 is part of the Safety Section (ANB00) under the System User Group.

At the time of its creation, the Committee's goal was defined as follows:

> *To focus on motor carrier safety in all its aspects. This includes research and evaluation in human, roadway, vehicle, operational, and organizational arenas as they relate to motor carrier safety.*

Also, at the time of its inception, the key functions of ACS60 were identified as follows:

- Inform members of the truck and bus safety community on current research.
- Stimulate new research and development.
- Synthesize research and develop appropriate reports.
- Review papers submitted to the TRB annual meeting and recommend papers for presentation, publication, and special awards.
- Plan and coordinate technical sessions and workshops at the annual meeting.
- Co-sponsor special activities and provide liaison with other related TRB committees.
- Conduct periodic strategic planning and self-evaluation.
- Upon request, serve or nominate others to serve as members of various TRB panels and committees.
- Encourage diverse participation, including students, young professionals, minorities, and professionals from countries outside the U.S.

The purview of the Committee was extensively discussed and debated. Ultimately the Committee's domain was defined to encompass these eight multidisciplinary topic areas:

1. Problem assessment and data.

2. Motor carrier safety laws and regulations.
3. Enforcement and compliance.
4. Health and wellness of commercial drivers.
5. Commercial driver human factors.
6. Carrier safety management.
7. Vehicle design and technology.
8. Compatibility of trucks and buses with the roadway environment.

These eight topics were subsequently examined and elaborated on in a TRB Circular, *The Domain of Truck and Bus Safety* (E-C117), published by the Committee in 2007. Within each topic area, the circular endeavored to characterize key issues, summarize state-of-the-practice, and identify future research needs.

One recurring challenge for the Committee has been the sheer breadth of its subject matter, as envisaged by the range of these eight topic areas. Consequently, the Committee structured its subcommittees to delve into a series of specialized topics requiring sustained focus.

The following ACS60 subcommittees are all presently functional:

- Truck and Bus Operator Health and Wellness.
- Motorcoach Safety.
- Truck and Bus Safety Data Needs.
- Technology.
- Carrier Safety Management.

The Health and Wellness, Motorcoach, and Data subcommittees were all established shortly after the Committee was created in 2003. Two other subcommittees, Carrier Self-Evaluation, and Alternative Compliance, have now both been "sunset." The Technology and Carrier Safety Management subcommittees were established in 2013 and 2018, respectively. One additional subcommittee, Driver Training, is currently inactive, but has not been disbanded; previously this subcommittee was sponsored jointly by ACS60 and ANB30, the Standing Committee on Operator Education and Regulation.

From 2002-2012, the Committee supported the work of the Commercial Truck and Bus Safety Synthesis Program (CTBSSP), funded by the Federal Motor Carrier Safety Administration (FMCSA) and administered by TRB. Over the 10-year period, some 24 synthesis reports were prepared on truck and bus safety issues of compelling interest. For each given topic, the corresponding synthesis report identified documented information, summarized existing practice, detailed ongoing research, and specified those problems remaining unsolved.

After the CTBSSP ended, the Committee redoubled its efforts to identify critical research needs within the realm of truck and bus safety. Since 2009, dozens of research needs statements (RNS) have been prepared and vetted by the Committee. Currently, 28 research needs statements on truck and bus safety are resident in TRB's RNS database.

Summary of the Plan:

This strategic plan aims to define the focus of the TRB ACS60 Truck and Bus Safety Committee for the next several years. Since its inception, the Committee has focused on research — that will not change. As a result, we are heavily invested in the TRB RNS process and in promoting high-quality research in the area of commercial motor vehicle safety. We are especially interested in practical applications of evidence-based research that can lead to safer practices and outcomes. We remain a community of stakeholders from industry, academia, government, and consulting. The Committee members' backgrounds change with each new rotation; however, we intend to keep a healthy mix of people with varied interests so that we cover the broad areas represented by our subcommittees: Safety Management, Health and Wellness, Technology, Data, and Motorcoach Safety. All of our members retain the safety focus that is core to our contributions to TRB and to safe commercial motor vehicle travel in the US and internationally.

The Committee has identified key activities it plans to pursue in the coming years. These include continued active participation in promoting research; conducting sessions both during the annual meeting and throughout the year; and staying engaged in specific issues related to safety management, compensation, and long-term driver health. New and emerging issues are generating strategic actions that will engage the full Committee and our subcommittees. These include automated commercial vehicles; industry-government regulatory cooperation; light-duty vehicle safety management; and the interactions between safety management and health and wellness.

For the immediate future, we propose to revise our Committee structure to combine motorcoach safety and motor carrier management into a single subcommittee. We also plan to address the issue of light-duty vehicle safety management in at least two subcommittees (Safety Management and Health and Wellness), with the potential for addressing the issue in other subcommittees as well. We are already implementing elements of this Strategic Plan by hosting a workshop during the 2020 TRB meeting on Safety Management in Light-Duty Vehicle Freight Operations.