CTE STRATEGIC PLAN COMPANION DOCUMENT
ADOPTED JUNE 20, 2018

INTRODUCTION

This document provides content that supports the Strategic Plan for the AASHTO Committee on Traffic Engineering (CTE).

TRAFFIC ENGINEERING DEFINITION

Traffic engineers utilize a unique combination of a wide variety of knowledge, skills, and abilities to address the safety and mobility of all user groups as they travel on the roadway network. CTE uses the following definition for traffic engineering:

> *Traffic engineers promote safe and efficient movement of motorized and non-motorized travel on roadway networks by using engineering and scientific principles to optimize traffic control, infrastructure, and demand management elements in a manner that guides road users in making appropriate travel decisions.*

Traffic engineering is distinct from planning, highway design (highway engineering), construction, maintenance, and funding disciplines, but there are elements of each of these involved in most traffic engineering activities. Traffic engineers must also understand human factors, driver education, traffic enforcement, regulatory, highway safety/safety management, transportation systems management and operations, and assessment management activities associated with the roadway network.

TRAFFIC ENGINEERING CHALLENGES

The traffic engineering profession faces a unique set of challenges that impact their decision making processes, interactions with the public, and the availability of resources.

- Priorities and policy-making decisions within public agencies are shifting from a focus on vehicular movement to a broader consideration of multiple user groups including transit, pedestrians, and bicycles.
- There is a greater focus on non-technical aspects of roadway networks such as livability, public health, economic vitality, aesthetics, and promotion of community values.
- Traffic engineers are sometimes expected to promote the needs of all user groups even on facilities where achieving a balance may be a difficult proposition.
- Agency traffic engineers are sometimes the technical bridge between the public and an agency. Public inquiries and complaints may be forwarded to the traffic engineering group for a response even if the source of the actual issue may have been created by a factor that is not typically a traffic engineering issue (such as inadequate geometric design, improper site design or site location, and/or changing characteristics of system users). From the public's perspective, the traffic engineer is expected to provide the

ability to travel from point A to point B without encountering undue delay and with an expectation of safety at minimum cost, including out-of-pocket and tax expenditures.

- Data collection for traffic engineering improvements may be limited to a volume count or speed study done on a single day for a period of one or two hours. It is challenging to collect comprehensive traffic engineering data that fully represents traffic condition over a period of hours, days, and seasons. Comprehensive performance measures are not consistently used to support traffic engineering decisions. More recently, technological advances are providing access to "big data" that have the potential to change how traffic engineering decisions are made.
- Many traffic engineering improvements can be implemented with less capital costs than other types of improvements such as widening a structure or rehabilitating pavement. While other engineering improvements are often planned through a capital improvement or long-term planning process, traffic engineering improvements are often implement on a short-term basis and sometimes using existing maintenance or public works budgets. As such, the ability to implement comprehensive (more expensive) traffic engineering improvements may be limited to the same opportunities of other major improvements.
- Traffic engineering is sometimes considered a "band-aid" type of treatment that fixes problems created by other deficiencies in the transportation system. While additional traffic control devices (the traffic engineering solution) may help to raise road user awareness of a system deficiency, the use of traffic control devices is treating the symptom rather than the root cause of the problem.
- Traffic engineering solutions do not always "solve" the problem. Sometimes, a traffic engineer simply moves the issue from a location where it creates a problem to another location where it is not noticeable. Or a traffic engineer may solve a large problem by dividing it into several smaller problems.
- Traffic engineering systems may be the only example of an engineering system where twice daily system failure is not only acceptable, it is typically expected. This can make it difficult to promote improvements in the system because expectations may be too low.
- The success of traffic engineering practices and decisions can be dependent upon the behavior of road users and the compliance of those road users with design expectations.
- Differences in rural and urban environments can change the emphasis and influences of decision-making processes.
- From an administrative perspective, traffic engineering responsibilities are addressed differently in various organizations. Traffic engineering may be a separate division/bureau in some state agencies whereas it may be a part of maintenance, design, or construction in other agencies.
- The increasing population of older drivers.
- Rapid advancements in technologies create challenges regarding regulations, appropriate practices, and system control. Examples of technology advancements include:
    - Automated Vehicles
    - Connected Vehicles (Vehicle to Infrastructure Communications and Vehicle to Vehicle Communication)
    - Infrastructure to Infrastructure Communications

    - In-Vehicle Communication and Entertainment Options (driver distraction)
    - Data collection capabilities that create "mega data."
- Decreasing focus on basic traffic engineering principles in higher education curriculums.

CTE FOCUS AREAS

CTE members use the core values to work toward the vision and mission statements by selecting, designing, operating, managing, and maintaining traffic infrastructure elements; preparing regulations for managing traffic; and planning for the future of traffic movement. Specific infrastructure elements, regulations, and planning activities are listed below.

- Traffic Safety
- Traffic Signing
- Pavement Markings
- Traffic Signals
- Temporary Traffic Control
- Bicycle and Pedestrian Control
- Roadway Lighting
- Access Management
- Communication Systems
- Freeway Management
- Intelligent Transportation Systems
- Speed Control and Speed Regulation
- Policy, Regulations, and Standards
- Operational Effects of Geometric Design
- Connected and Automated Vehicles
- Driver/User Characteristics
- Vehicle Characteristics

CTE STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS

The following present the most significant issues related to the strengths and weaknesses of CTE plus the opportunities and threats facing CTE.

- **CTE Strengths:**
    - CTE is the only group focused on traffic engineering at the state level, providing ideal networking opportunity.
    - The CTE listserve provides an excellent means of sharing technical and policy information and most of the CTE members are active on the listserve.
    - CTE produces the AASHTO publication "AASHTO Guidelines for Supplemental Guide Signing."
    - CTE contributes to the AASHTO publications: "Guide for the Planning, Design, and Operation of Pedestrian Facilities," "Guide for the Development of Bicycle

Facilities," "Guide for Geometric Design of Transit Facilities on Highways and Streets," and "Roadway Lighting Design Guide."
    - CTE contributes to the development of MUTCD content through the National Committee on Uniform Traffic Control Devices.
    - CTE contributes ideas to NCHRP research program.
- **CTE Weaknesses:**
    - Provides limited number of products for use by the profession.
    - A limited number of people have been CTE members over an extended period.
    - The value of the listserve is not promoted and is thereby underappreciated by non-CTE members.
    - There have been frequent changes in CTE chairs in recent years.
    - Limitations on the ability of AASHTO staff to focus dedicated time to CTE and the lack of funding for data gathering and other technical activities.
    - Traffic engineering at the state level may be out of touch with traffic engineering needs at the local level.
- **CTE Opportunities:**
    - Technology is creating new methods of managing traffic, including the ability to have more data for analysis. CTE could be a leader in providing traffic engineering recommendations for incorporating technology and data into traffic engineering methods.
    - A greater number of traffic engineering issues are being addressed in a public policy process. CTE can shape the nature of those discussions by developing or contributing to the development of national, regional, or state policies, regulations, and/or policies on key topics.
    - The value of the CTE listserve could be enhanced for some topics by creating a mechanism that allows industry and/or the private sector to contribute solutions to those specific topics without creating sales calls or solicitations on those who post or comment. The value of the CTE listserve could be better promoted by providing more visible documentation of the information shared through the listserve (such as a summary posted on the CTE listserve).
    - The closely related nature of the CTE and TSMO could be better coordinated through occasional joint meetings (combined annual meeting or an on-line mid-year meeting).
    - Changes in traffic engineering create a need for more coordination with and contributions to the NCHRP research program and individual state research programs, including presentations at meetings and/or reports.
    - Ad-hoc committees formed to address specific issues over a short time frame could produce useful products.
- **CTE Threats:**
    - Technology and public policy processes are changing how the traffic engineering profession functions and responds. CTE could become less relevant if it does not respond to changes in the profession and the related environment.
    - AASHTO Subcommittee on Transportation Systems Management and Operations (TSMO) addresses issues that are closely related to traffic engineering and the responsibilities of the two subcommittees are similar, with TSMO addressing some of the higher profile areas within the traffic engineering/operations arena.

- The value of CTE as an AASHTO subcommittee may be questioned if CTE does not provide concrete products or other indications of its value.
- CTE will need to focus more attention on the pedestrian, bicycle, transit, and toll road aspects of traffic engineering if it wants to be viewed as relevant by important user groups.