Evolving Knowledge Transfer

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Background

Access to current, accurate information is essential for transportation planning and engineering practitioners. Disseminating information that is value-added, timely, and relevant to practice across disciplines and global geography is one of ITE’s Strategic Goals.

ITE has made improvements to the website in recent years. These changes have made it easier to find relevant information on topics; however, there is some inconsistency as to how the information is presented. The information provided in the project is meant to aid in providing a more consistent website experience for members for each topic.

This project seeks to improve the existing process(es) for transportation professionals to find information. Our team developed a proposed framework that can be applied to Institute Initiative topic areas to organize and disseminate information, providing additional value for ITE members and the transportation industry.
State of Practice

This section summarizes our review of ITE’s website and websites of other technical organizations to assess and understand the current state of information dissemination in our industry.

INSTITUTE OF TRANSPORTATION ENGINEERS (ITE)

According to ITE’s IT Services Senior Director, the content of the Technical Topic pages on the ITE website are the responsibility of members of the organization’s technical staff. Each staff member has two or three of these pages in their portfolio. Quarterly reviews of these pages scheduled, but these reviews can get overlooked when working on competing projects with deadlines. The organization’s goal is to provide organized and current content on its website.

Initially, the website appears to provide a wealth of information on a broad range of transportation subjects. Navigating any of the primary topics (listed by title) is a simple series of clicks. There is an option to search by phrase, but the results do not inspire confidence.

Finding information on other subjects is more ‘clunky’; the search option in the website defaults to ‘Advanced’ and prompts you to fill numerous fields. You can just search by a phrase, but that’s not the first option, which makes it seem more complicated than it needs to be. Also no option to filter results, e.g., by most recent, or publisher/organization, etc.

The searches provide what initially appears to be a wealth of information, but as you work your way through, it seems to be all information very ITE-centric with numerous articles from the ITE Journal. The ITE Library lacks content from other sources with being predominately articles and very few manuals or guidelines.

A trial search for a document that can be located on the Association of Pedestrian and Bicycle Professionals website did not find the material. We want to be the place practitioners go to find relevant and useful information, but this would be a significant undertaking to set up.
Upon review of content related to connected and autonomous vehicles (CAV), our team found that the material is not up to date, and there are several broken links. “Current Activities” is not current, with documents dating back to 2008. Several URL links to external websites are broken.

ASSOCIATION OF PEDESTRIAN AND BICYCLE PROFESSIONALS (APBP)

Limited content was found, and APBP’s website lacked a search function. There was some useful information for practitioners. This website would benefit from cross-reference.
ILLUMINATING ENGINEERING SOCIETY

The website has either drop-downs or links to current information with a section dedicated to News, Standards, and Education. The site is challenging to search as an individual must go to the definitions page to search for a topic, but the link is only for that definition and similar definitions with no links to relevant standards or guides on the subject.

NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO)

NACTO’s website is easy to navigate with a very useful search function. NACTO offers current state of practice information alongside numerous published guidelines that are graphics-heavy. ‘Light’ versions of their published guidelines can be accessed for free via cross-referenced webpages, with the option to purchase the full text in a hardcopy book.
Proposed ITE Website Topic Framework

Strategizing the content on ITE’s website to support the organization’s mission is instrumental in maintaining and growing membership. Aside from making content easier to read, content consolidation strategy also includes reducing and organizing the content so that users aren’t too distracted while navigating through the website.

Our Mission

To provide the global community of transportation professionals with the knowledge, practices, and skills to serve the needs of their communities and help shape the future of the profession and transportation in the societal context.

Many factors help define ITE’s website content. Our team proposes progressive content changes at scheduled quarterly intervals of the Institute Initiative pages because these are the lowest hanging fruit for producing results. After revisions are made, analytics should be tracked and member perceptions obtained, with further improvements based on this gathered data. The design and general layout of the ITE website should remain in place.

The following proposed framework was created to provide direction on what information to gather and how to organize content on an ITE webpage for any topic area.
DEFINITION / INFORMATION

The ITE webpage for a topic area should contain a brief topic definition and clearly describe the meanings of supporting terms. For example, how does ITE define Connected and Automated Vehicles? What does it mean to ITE? ITE, through its relationships with other organizations and agencies, should help clearly define the definition of topics its representing.

For Connectivity:
in reference the term **Connected Vehicle**

According to SAE J2735, defines the structure of current set of messages.

For Automation:
in reference the term **Automated Vehicle**

According to SAE J3016 section 7, describes terms that are not recommended practice because they are imprecise and therefore misleading. ITE should help promote the term differences.

- Autonomous
- Automated
- Self-Driving
- Driverless

ITE’S ROLE

The webpage for a topic should convey the goal for disseminating the subject matter and how ITE will address the topic. What is ITE supporting or facilitating? A brief description should be provided for each of the following areas, with links to more detailed discussion or publications, if available.

- Goal
- Challenges
- Methodologies
- Research
- System Design
- Deployment
- Collaboration
If appropriate, guidance to various audiences could be provided with ITE’s desired action from those audiences. These audiences may include:

- members,
- the general public,
- public agency staff,
- elected officials, and
- private consultants.

**MEMBER-ONLY BENEFITS**

*Member Library*

In this area of the webpage, ITE can show member knowledge expansion on the topic. Links will take members to the Members Only section of the ITE website for more in-depth research conducted by other members and how ITE has impacted the development of the topic. Also, in the Members Only section, members can share any lessons learned while developing more information or where ITE needs to aid in the further development of the topic.

ITE can be the leading edge on certain topics, but for other issues, ITE may not be as the forefront. ITE and members need to be cautious about posting/providing old or misleading information that may misguide members. Also, some topic areas can be misleading or close to other topics. The information posted must be verified as relevant to the topic and not posted to one topic when it should be classified under another. Connected and Autonomous Vehicles are similar but can easily be misconstrued as being one of them when the actual information should be posted under the other.

*e-Community*

The ITE e-Community is an excellent resource for members. ITE e-Community allows members to ask questions on a topic to peers from across the organization. Committees post information to the members that follow indicating what the committee is focusing their efforts. Members can see and search to see if someone has already asked a similar question that they may have and see what information already exists. Members can share their knowledge of their experience or be involved with the committees. However, members need to understand that those with a deeper understanding and knowledge of the topic need to take the lead when answering questions, so misinformation isn’t continually shared.

One potential area of improvement on the ITE e-Community would be to make the communities easier to identify if they are for Committees, Members, or Students without having to navigate to the community page. Some are, but consistency across the communities would be helpful.
LINKS TO OTHER REPUTABLE ORGANIZATIONS

Many other websites have information on emerging transportation topics, for example, the U.S. Department of Transportation (USDOT), ITS America, ITS World Congresses, Institute of Electrical and Electronics Engineers (IEEE), APBP, NACTO, and Society of Automobile Engineers (SAE). Sharing relevant links with members will assist in streamlining knowledge transfer.

Moving Forward

While currently, the content of the Technical Topic pages on the ITE website is the responsibility of members of the organization’s technical staff, we believe that the technical information on the ITE website needs to be recommended by members of a respective technical committee to vet the source information. The website administrator should be relying on ITE’s technical committees for new and up-to-date information. To help with preparing the information in a consistent format, in addition to the framework and website layout, a web-based prompt list has been developed to aid in consistently assembling any new webpage information. The technical committee should gather the information they want to present on the topic area webpage. Some webpages may not have all categories populated if the information does not exist.

Technical information is continuously changing; therefore, it is also proposed that each ITE technical committee designate a member as a webpage liaison. That member would be responsible for coordinating website updates with ITE technical staff or potentially implementing the changes themselves. For consistency, the web-based prompt list should be utilized to document the information to be updated.

Also, all webpage liaisons could form a new group or committee that would hold each other accountable for quarterly updates and have the capabilities to serve as an extension of staff to ITE’s IT Services Senior Director for assistance in updating any portion of the website (technical areas or other).

We believe the strategies proposed will improve access to current, accurate information for transportation planning and engineering practitioners.
The Institute of Transportation Engineers is a leader in advancing the design and deployment of connected, automated and cooperative technologies in the transportation system to improve safety, mobility, reduces energy consumption and emissions aimed to improve the quality of life.

Through emerging technologies available in the market today and future technologies in development, the transportation profession is in a unique opportunity to transform the transportation system. The Institute of Transportation Engineers is here to help you become a leader and provide you with the technical resources you need to be successful for improving the transportation system using this emerging technology.
There are three focus areas in that ITE is primed to support the design and deployment of this technology:
1) Connected Transportation
2) Automated Transportation
3) Cooperative Transportation

Resources
- USDOT JPO Pilots
- USDOT JPO site on Automation
- NHTSA Levels of Automation
- SPAT Challenge
- Links to current rulemakings and RFI's related to CV and AV
- ITE CV/AV community page
- To join the free ITE Connected Vehicle electronic discussion group, click here.

Other Related Organizations

ITE UPDATED POSITION STATEMENT ON CONNECTED AND AUTOMATED VEHICLES

Connected Transportation
Connectivity will enable vehicles, roads and other infrastructure, and our smartphones to all communicate and share vital transportation information through advanced wireless communication technology.
Connected Transportation

Connectivity will enable vehicles, roads and other infrastructure, and our smartphones to all communicate and share vital transportation information through advanced wireless communication technology.

**CONNECTED VEHICLE (CV) TECHNOLOGIES**

CV technology focuses on sharing information to better assist the humans in safe decision making while driving aimed to improve safety.

CV has the potential to transform travel as we know it. Connected Vehicle combines leading edge technologies — advanced wireless communications, on-board computer processing, advanced vehicle sensors, GPS navigation, smart infrastructure, and others — to provide the capability for vehicles to identify threats and hazards on the roadway and communicate this information over wireless networks to give drivers alerts and warnings.

At Connected Vehicle’s core is a networked environment supporting very high speed transactions among vehicles (V2V), and between vehicles and infrastructure components (V2I) or hand held devices (V2D) to enable numerous safety and mobility applications.
This capability to identify, collect, process, exchange, and transmit real-time data provides drivers with a greater situational awareness of the events, potential, threats, and imminent hazards within the vehicle’s environment. When combined with technologies that intuitively and clearly present alerts, advice, and warnings — drivers can make better and safer decisions while driving. Additionally, when further combined with automated vehicle-safety applications, Connected Vehicle provides the vehicle with the ability to respond and react when the driver can’t or doesn’t in time, significantly increasing the effectiveness of crash prevention and mitigation applications. Some potential applications of Connected Vehicle are described below:

- **Vehicle-to-vehicle (V2V).** When a vehicle breaks suddenly, it can transmit a notice to vehicles behind that enable those vehicles to warn drivers to stop, or automatically apply brakes if a crash is imminent.

- **Vehicle-to-infrastructure (V2I).** A vehicle in an accident could transmit incident data — time of incident, type of crash, severity — through a roadside infrastructure device to system operators who then broadcast regional warnings. Simultaneously, incident data could be transmitted directly to emergency dispatchers for emergency response.

- **Vehicle-to-others (V2D).** A car turning right may be able to send an alert to a bicyclist’s cell phone or device on the bike and avoid a potential collision.

To join the free ITE Connected Vehicle electronic discussion group click here.

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**Automated Transportation**

Automation will enable vehicle systems and infrastructure systems to all provide better decision making capabilities to help improve the safety and operations of the transportation system.

**Automated Vehicle (AV) Technologies**

Automated Vehicle (AV) technology will enable robotic control to assist the human in safe decision making or control the driving task without human interaction of a vehicle. AV technology can transform the transportation system by making roads safer and provide transportation accessibility.

AV are those in which at least some aspect of a safety-critical control function (e.g., steering, throttle, or braking) occurs without direct driver input. Automation has the potential to significantly impact our driving safety, personal mobility, energy consumption, operating efficiency, environmental sustainability, and land use. While research into automated vehicles and other aspects of automation are in the early stages, it is rapidly gaining attention around the world in all sectors of the economy.
SAE led the development for the SAE J3016 that provides AVs with a breakdown into 5 levels based on their functionality. Auto manufacturers and technology companies are leading the development of this technology referred to as driving automation systems.
As the automation levels increase and transfer responsibility from human to the robotic control, there becomes a delineation for the Levels 3-5. These levels are referred to as an Automated Driving System (ADS) as the driving task are controlled by the robotic control and the human is more and more out of the loop. ADSs are vehicle complex systems that industry is developing to enable safe and independent driving for any given environment.

An ADS uses a map of the road, uses sensors to detect objects, and is always planning what the vehicle will do in the present and future. These systems are so complex and industry is racing to solve the problem.

As ITE transportation professionals, learning how these systems work and how they are navigating through urban and rural cities is essential. ITE is focused on advancing the transportation system to operate safely for human and automated vehicles.

**VEHICLE TO INFRASTRUCTURE DEPLOYMENT COALITION V2I DC**

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**Cooperative Transportation**

Cooperation will enable automated vehicles, roadway infrastructure and other road users to work together to improve the efficiency and safety of the transportation system.
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CONNECTED AND AUTOMATED (CAV) TECHNOLOGIES

Connected and Automated Vehicle (CAV) technology describes the way in which connectivity and automation are combined to provide safer operations and improved efficiency of the transportation system. This is referred to as the Cooperative Driving Automation (CDA) which is being standardized by SAE J3216.

Cooperative Driving Automation is still in the Research and Development phase but provide the opportunity to transform the transportation system with emerging technology. As transportation professionals are planning a collective vision of a connected and automated transportation system, cooperative is a key ingredient to help meet our system performance objectives.
As ITE transportation professionals, learning about the future is key for long range planning efforts. ITE is focused on supporting the knowledge transfer for research and development of technologies that will transform transportation system to maximize the efficiency and safety of the entire transportation system.

ITE Member Resources [Login Required]

Councils and Committees

- ITE CV/AV Steering Committee
- ITE CV/AV Task Force
- National Operations Center of Excellence SPAT Challenge
- Cooperative Automated Transportation (CAT) Coalition

Projects and Sessions

- CAT Coalition
- Roadside Unit (RSU) Interface – NTCIP 1218
- CV/AV Steering Committee site on ITE Community
Technical Website
Update Prompt-List

Name *

First Name

Last Name

Email *

Council/Committee *
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Links to Other Reputable Organizations with Knowledge on the Topic