



Designing Pedestrian Facilities for Accessibility (DPFA) - A New Workshop Offered by TTAP

By Frank Brewer

It must be acknowledged that the pedestrian is a road user. They travel at much slower speeds and generally travel shorter distances. Just as we want to provide safe and improved pathways for the vehicular traffic, the pedestrian traffic must be accommodated. Yet we have a number of pedestrians that are not able to freely travel these provided pathways (sidewalks). Due to personal disabilities, the hazards of traveling so close to and interacting with the vehicular traffic are greatly magnified.

TTAP is offering training to assist roadway agencies with accommodating these road users. The title of the training is Designing Pedestrian Facilities for Accessibility (DPFA). You should be aware of the requirements for Americans with Disability Act Accessibility Guide (ADAAG) Transition Plans and the proposed Pedestrian Right Of Way Accessibility Guide (PROWAG). The facilities within the public right-of-way (including walkways, ramps, curb ramps and landings, crosswalks, and pedestrian overpasses and underpasses) must be designed, constructed and maintained to serve all users. This class will help tie the ADAAG and PROWAG together. It also offers alternatives to the remediation of your existing facilities.

The DPFA class is 1.5-day class with field activities covering:

- Americans with Disabilities Act Accessibility Guidelines (ADAAG) and Public Rights-of-Way Accessibility Guidelines: Laws and Regulations
- Legal Requirements
- Pedestrian Characteristics
- Pedestrian Access Route (PAR)
- Curb Ramps and Other Transitions
- Detectable Warnings
- Pedestrian Crossings
- Street Furniture and Parking
- Work Zones and Maintenance
- Accessible Pedestrian Signals
- Outdoor exercises with manual wheelchairs, blindfolds/canes and low-vision goggles)



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From the Director

I was just looking back at my “From the Director” column in the Winter 2018 RoadTalk and it makes me look like a pretty decent amateur meteorologist. Either that or I just provided a generic description of almost every Tennessee spring I’ve seen in my lifetime. At any rate, it sure does seem like we made a quick leap from an unusually cool April to a relatively-toasty May. Summer will no doubt be hot and humid, but fall (or at least football season) will be here before we know it. I hope that I can brag a little bit on my Vols by the end of the year, but I’m not going to count those unhatched chickens just yet.

This issue of RoadTalk gives you a snapshot of what’s happening in the world of transportation. The Designing Pedestrian Facilities for Accessibility (DPFA) workshops in Jackson and Nashville were well-attended and gave participants a great opportunity to identify common Americans with Disabilities Act (ADA) compliance issues, experience some of the challenges faced by persons with disabilities in the built environment, and identify countermeasures and design practices that can make sidewalks accessible to a wider range of road users. We will be hosting more DPFA workshops in Knoxville and Chattanooga in September.

Safety is always a big concern in the world of transportation, and for spring we have two articles that focus on Roadway Safety. The first article discusses the Road to Zero Coalition and its efforts to reduce roadway deaths to zero by 2050 through the expanded use of proven safety countermeasures, deployment of advanced technologies, and creation of a safety culture within the transportation industry. The second article discusses strategies to improve pedestrian safety and unsignalized locations. These countermeasures, including crosswalk visibility enhancements, raised crosswalks, pedestrian refuge islands, pedestrian hybrid beacons, and road diets, are featured in FHWA’s Every Day Counts program as the Safe Transportation for Every Pedestrian (STEP) initiative.

Finally, you’ve probably seen autonomous vehicles in the news lately. Our own Spence Meyers provides a quick primer on the Society of Automotive Engineers’ levels of automation. These levels can be used to describe the sophistication, or relative autonomy, of all vehicles on our roadways. The levels range from zero (completely manual operation where the driver maintains complete control) to five (fully automation under all conditions – no driver is needed). We may see these terms used more frequently as technology moves from the test track to the showroom.

That’s all for now. Please stay cool out there in the hot weather and watch for heat-related illnesses. As always, please let me know if there is anything that TTAP can do to help you. I’ll check in with you again in our summer newsletter.



Designing Pedestrian Facilities for Accessibility (DPFA) - A New Workshop Offered by TTAP, *continued from page 1*

As mentioned, the outdoor activities will allow you to experience firsthand the difficulties experienced by this group of road users. It is often said by TDOT ADA Coordinator Margaret Mahler that we are all one step or slip from a disability, temporary or permanent.

The target audience for this workshop is local and state personnel with responsibility for designing, constructing and maintaining facilities in the public right-of-way. These include engineers, MPO staff, technicians, public works directors, street supervisors and crew leaders.

The next offerings of Designing Pedestrian Facilities for Accessibility will be in Chattanooga on September 10-11 and in Knoxville on September 12-13. You can find more information on our calendar of classes at <http://ttap.utk.edu/training/course-calendar.php>.

Please note, we are limited on space and will be operating on a first-come basis. When the number of seats has been reached, additional registrants shall be placed on a wait list. They will be notified of that situation. Please notify TTAP if you will be unable to attend once you have registered. We will attempt to fill any open seats by three operating days before the class start date.



Statewide Approval to use Pedestrian-Actuated Rectangular Rapid-Flashing Beacons (RRFBs)

By: Airton Kohls (Source: FHWA)

In our 2018 Winter issue of Roadtalk we discussed the new Interim Approval (IA-21) on RRFBs. Now, we are here to inform you that the Tennessee Department of Transportation has received approval on a blanket basis to use the Pedestrian-Actuated Rectangular Rapid-Flashing Beacons (RRFBs) at all locations in Tennessee at which TDOT or local highway agencies install RRFBs under the technical conditions contained in IA-21. The request was made under the provisions of Section 1A.10 of the 2009 edition of the Manual on Uniform Traffic Control Devices for Streets and Highways and the Federal Highway Administration's Interim Approval memorandum (IA-21) dated March 20, 2018 for the optional use of RRFBs.

Local jurisdictions that install RRFBs under this Interim Approval should inform the Tennessee Department of Transportation (TDOT) State Traffic Engineer. FHWA requires TDOT to maintain and periodically update a list of all the locations where this traffic control device is used.

The Six Levels of Vehicle Automation

By Spence Meyers and Airton Kohls (Source: USDOT, NHTSA, Automated Vehicles for Safety)

Almost every vehicle on the road has some automation in its design. We may not immediately perceive them as such. Something as simple as cruise control is a form of automation that has been used in automobiles for decades. The little “ding ding ding” we hear when we forget to turn off our turning signals is an automatic safety feature in many cars.

The Society of Automotive Engineers (SAE) recognizes six levels of automation in motor vehicles today. These range from 0 or no assistance to level 5 in which a human driver is not needed. We may be a long way from level 5, some of us hope so anyway; but we are also long gone from level 0 as well. We may have antique Model T's on the road but new vehicles without any automated safety features are long gone. Every day inches us closer to higher automation levels.

Level zero represents no automation at all in a vehicle. This level is just for reference because these vehicles will likely not be entering production again. Level zeros have no cruise control, no anti-locking brakes even, but some system warnings may be present. Of course as I mentioned before there are now, and probably always will be, some of these vehicles on the road. Not just the Model “T’s” but even the 1968 Mustang or Camaro might be in this category. The driver performs all driving tasks on level zero automation. Level one is the basic vehicle of today. Every new vehicle will come with some automated safety features. Speed control will be in most of these cars. Speed/Cruise control is not strictly speaking a safety feature, in fact in many situations it should not be used because of safety. Rainy, snowy or other slick conditions are some of the contra-indications of using cruise control. But on dry open highways in low traffic conditions speed control is a useful tool. Lane monitoring may be present in these vehicles. Blind spot monitoring is another feature that improves safety by issuing a warning but may not take over operation of the vehicle. On level one, the driver controls the vehicle with the help of some driving assist features.

Level two makes much more use of the system controls. The vehicle may operate functions of driving independent of a human driver, like accelerating and steering. However this does not mean hands free operation. The driver must remain engaged with the driving task and monitor the environment at all times.



Source: U.S. Department of Transportation, National Highway Traffic Safety Administration, Automated Vehicles for Safety, accessed February 2, 2018, <https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety>

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Level three is the highest level in production and ready for the street. At least some say so. These vehicles, while requiring a driver to be present, are completely hands off. The SAE even labels them "Eyes off", not needing to monitor the environment. This means the driver can text or even watch a movie but must be immediately ready to retake control of the automobile. There are several manufacturers making these vehicles. There have been incidents with some of these vehicles failing under certain circumstances.

Level four is the first category that is completely autonomous. No driver input is needed. The driver may have the option to control the vehicle. The caveat is that it will only operate under specific conditions. If the environmental conditions exceed its operating threshold it is supposed to give control over to a human driver or to safely park itself if the driver does not take over.

Level five or the "Holy Grail" is completely driverless in every environmental condition. These vehicles will have no steering wheel, no mirrors, can even have the windshield darkened so the passenger can sleep. These exist only under testing conditions now. They have actually been present for many years in this format. The earliest completely autonomous vehicles were large military trucks that competed on off road military test tracks. Many hurdles will have to be surmounted for these vehicles to come into production and wide scale use.

What do all of the words and acronyms mean in this world of vehicle automation?

Automated, autonomous and connected? Automated vehicles 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. An automated vehicle may be autonomous using vehicle sensors to navigate the roadways. Automated or autonomous vehicles may be connected, using communications systems to interact with each other and roadside infrastructure, fully implementing technology to enhance roadway safety.

Road to Zero

Edited by: Arton Kohls (Source: Road to Zero Coalition - National Safety Council)

"Getting to Zero deaths isn't impossible, it just has not been done yet!" It is with this sentence that I would like to ask you to read "The Road to Zero – A Vision for Achieving Zero Roadway Deaths by 2050" report. You can find it at <https://www.nsc.org/road-safety/get-involved/road-to-zero>

The Road to Zero Coalition is led by the U.S. Department of Transportation with Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), National Highway Traffic Safety Administration (NHTSA) and National Safety Council (NSC) in partnership with the Centers for Disease Control and Prevention (CDC). Currently the coalition consists of 675 stakeholders dedicating time and energy to achieve ZERO roadway fatalities. There is no cost to join. You can find more information at the website provided above.

"We demand 100 percent safe operations in aviation, marine, pipeline, rail and transit, we should cultivate a corresponding societal demand for safe roads," said NSC President and CEO Deborah A.P. Hersman.

The Coalition identified three main initiatives to reduce roadway fatalities in their report:

- Double down on what works through proven, evidence-based strategies
- Advance life-saving technology in vehicles and infrastructure
- Prioritize safety by adopting a safe systems approach and creating a positive safety culture

Double Down on What Works - The United States has both an accumulated body of evidence-based countermeasures and a well-established network of experts who can deploy them. The RTZ Coalition envisions engaging political leaders and decision makers to support policies and identify new or shared

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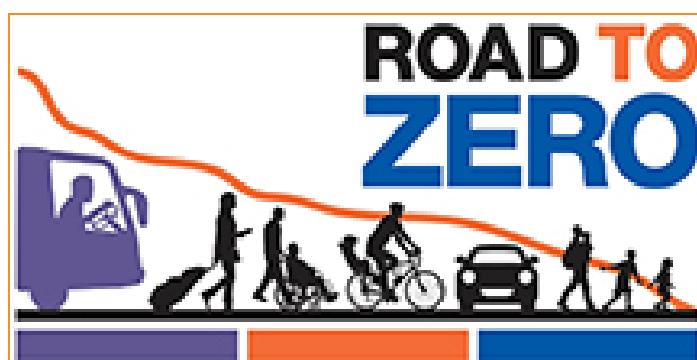
resources for research, roadway design and construction, vehicle engineering, law enforcement, consumer education, and trauma care. Because motor vehicle crashes represent the single largest cause of workplace fatalities, the RTZ Coalition will look to establish partnerships with businesses at the state and community levels as an important source of new energy for such change.

Accelerate Advanced Technology - Existing and emerging technologies promise large advances in safety. Advanced driver assisted systems —such as automatic emergency braking, adaptive cruise control, and lane-keeping—are already being introduced into the fleet. Each year, these technologies are offered on a greater number of new vehicles and their safety performance improves. The rate of technology development, both in vehicle systems and in overall connectivity, is expected to increase rapidly. To accelerate the deployment of these vehicle and infrastructure technologies and maximize their potential reach in a 30-year timeframe, the RTZ Coalition envisions new partnerships among manufacturers, technology providers, emergency medical and trauma systems, public safety/health groups, and the public sector to identify and prioritize safety applications and opportunities, to evaluate safety benefits, and to increase consumer interest and adoption through education and incentives.

Prioritize Safety - The third approach focuses on methods to facilitate change. Key among these are creating a safety culture and adopting a Safe System approach. A pervasive safety culture is an essential ingredient for reaching zero roadway deaths and can be nurtured through awareness, education, and constant reinforcement. Safety needs to be among the highest priorities in decisions ranging from where to cross the street to where to devote federal funds. There are many opportunities to nurture a safety culture. For example, fostering development of community road safety action programs may prove effective in engaging citizens, corporations, and governments and changing social norms. Adopting the Safe System approach involves a fundamental shift from the common assumption that crashes generally happen because of people's behavior. Instead, a Safe System approach assumes that people will occasionally, but inevitably, make mistakes behind the wheel and that the overall transportation system should be designed to be forgiving so that these mistakes do not lead to fatal outcomes. The Safe System approach also involves commitment to analyze safety problems, identify changes that bring the best return on investment, and implement these improvements throughout the system to prevent further occurrences.

These three approaches are essential and interconnected; none of the three will work effectively independent of the others. They are complementary, mutually dependent, and synergistic. For example, a growing safety culture will foster safe behaviors, such as driving sober and within the speed limit, and create a strong market for advanced safety technologies (including automated vehicles). As people become accustomed to the safety benefits of advanced technology and improved roads, they will become less tolerant of risky behavior and more supportive of the changes needed to build a Safe System. The effect of each change is intertwined with the others and mutually supportive—a “virtuous cycle.”

Finally we are getting close to travel and vacation season. Therefore, buckle up, don't drive distracted and keep your family safe on the roadways!



Guide for Improving Pedestrian Safety at Uncontrolled Locations

Edited by: Airton Kohls (Source: US DOT FHWA - Every Day Counts)

Pedestrians are among the most vulnerable road users, accounting for approximately 16 percent of all roadway fatalities nationally in 2016, per the Fatality Analysis Reporting System (FARS). In Tennessee, we had 97 pedestrian fatalities in 2016, a little more than 9% of the total traffic fatalities. Pedestrians are especially vulnerable at non-intersection locations, where 72 percent of pedestrian fatalities occur. Focused on addressing the issue, FHWA has just published the Guide for Improving Pedestrian Safety at Uncontrolled Locations. This document was produced as part of the Safe Transportation for Every Pedestrian (STEP) program. STEP is part of the fourth round of Every Day Counts. STEP's purpose is to help transportation agencies address crashes by promoting countermeasures with known safety benefits at uncontrolled crossing locations. You can download a free copy of the document at: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/guide_to_improve_uncontrolled_crossings.pdf

This guide addresses safety issues at uncontrolled pedestrian crossing locations, which occur where sidewalks or designated walkways intersect a roadway at a location where no traffic control (i.e., traffic signal or STOP sign) is present. These common crossing types occur at intersections (where they may be marked or unmarked) and at non-intersection or midblock locations (where they must be marked as crossings). Overall, uncontrolled pedestrian crossing locations correspond to higher pedestrian crash rates than controlled locations, often due to inadequate pedestrian crossing accommodations. By focusing on uncontrolled crossing locations, local and State agencies can address a significant national safety problem and improve quality of life for pedestrians of all ages and abilities.

The document is structured in 6 Chapters that include collecting data and engaging the public, inventory conditions and prioritizing locations, analyzing crash types and safety issues, selecting countermeasures, consulting design and installation resources, identifying opportunities and monitoring outcomes. It provides two reference tables to help identify countermeasure options. One identifies countermeasures by roadway conditions such as vehicle speed limit, annual average daily traffic (AADT), and number of travel lanes. The other (presented below) helps further pinpoint the most appropriate countermeasures by common safety concerns such as failure to yield or excessive vehicle speeds. The guide does not include specific recommendations for countermeasures based on all criteria in design and reference manuals, such as actual speeds and pedestrian volumes. The agency should reference the Manual on Uniform Traffic Control Devices (MUTCD), American Association of State Highway and Transportation Officials (AASHTO) design guidelines, and State and local practices when selecting one or more specific countermeasures.

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement	行人	行人	行人	行人	行人
High-visibility crosswalk markings*	行人		行人	行人	
Parking restriction on crosswalk approach*	行人		行人	行人	
Improved nighttime lighting*	行人		行人		
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*	行人		行人	行人	行人
In-Street Pedestrian Crossing sign*	行人	行人	行人	行人	
Curb extension*	行人	行人	行人		行人
Raised crosswalk	行人	行人	行人	行人	
Pedestrian refuge island	行人	行人	行人		行人
Pedestrian Hybrid Beacon	行人			行人	
Road Diet	行人	行人	行人		行人

*These countermeasures make up the STEP countermeasure "crosswalk visibility enhancements." Multiple countermeasures may be implemented at a location as part of crosswalk visibility enhancements.

Safety issues addressed per countermeasure. (Guide for Improving Pedestrian Safety at Uncontrolled Locations)

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3. Please list any other ideas or suggestions on how TTAP could assist you.

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