

**Review of Driver's Education Curricula:
Analysis & Recommendation Report**

**Identifying Barriers to Understanding Pedestrian and Bicycle Safety
Laws**

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List of Abbreviations

FY	Fiscal Year
LED	Light Emitting Diode
PHB	Pedestrian Hybrid Beacon
RRFB	Rectangular Rapid Flashing Beacon
TCD	Traffic Control Device(s)
TMUTCD	Texas Manual of Uniform Traffic Control Devices
TTC	Texas Transportation Code
TTI	Texas A&M Transportation Institute
TxDOT	Texas Department of Transportation

Introduction

Driver's education is a key component of safety on the roadway. When it comes to pedestrians and bicyclists, their safety is often left in the hands of drivers. Pedestrians can wonder, *does that driver see me? Will that driver yield to me? Is it safe to cross the road here?* Bicyclists can wonder, *does that driver see me? Is it safe to ride my bike here? Will that driver pass me at a safe distance?* These concerns are at the heart of this analysis.

Driver education curriculum that covers pedestrian and bicycle safety laws was mentioned in focus groups and surveys in previous years of the Texas Department of Transportation (TxDOT) funded project, "Identifying Barriers to Understanding Pedestrian and Bicycle Safety Laws (Johnson et al., 2021a, 2021b; Johnson & Hudson, 2022)." Furthermore, the Pedestrian and Bicycle Information Center (PBIC) discusses the importance of a driver's understanding of the impact of their decisions on the safety of those who walk and bike (n.d.). These findings precipitated the inclusion of this activity in the Fiscal Year (FY) 2023 grant.

Methods

For this analysis, the project team acquired 11 driver's education/defensive driving curricula (10 English and one Spanish) from a variety of providers in Texas. The curricula were acquired by inquiring with providers directly, reaching out to other traffic safety partners, and purchasing online curricula. Some were example curricula provided by licensing agencies from the state of Texas. The curricula reviewed were a mix of online and in-person, and teen and adult. One company allowed a Texas A&M Transportation Institute (TTI) researcher to sit in on an in-person course. Some courses were paid for using project funds and others were provided at no cost by the provider.

As mentioned above, one Spanish curriculum was also reviewed and compared to the English version from the same company to ensure that the content was the same in both languages and that nothing was lost in translation. This review was completed by a project team member that is fluent in Spanish. No discrepancies were identified between the English and Spanish versions.

For this report, the names and identities of the companies from which driver's education curricula were obtained are not identified and known only to the TTI project team. The goal of the analysis is to provide an overall picture of the inclusion of pedestrian and bicycle safety topics in Texas curricula as a whole, and not to identify missing content in a specific curriculum. However, the results of the analysis, including the specific assessment of each curriculum will be made available to companies included in this analysis upon request.

Prior to the beginning of reviews, a set of criteria was compiled by the project team and entered into the online survey platform, Qualtrics. After reviewing each curriculum, the reviewer submitted a questionnaire regarding the content of the curriculum they reviewed. Whenever possible, two project team members reviewed each curriculum; this was achieved in all but two cases. Having two people review each curriculum helped to ensure that no information was missed in the assessment, with at least one person being a TTI subject matter expert on pedestrian and bicycle safety. The survey asked if specific content was included in the

curriculum as a binary, yes or no question, but also asked for an assessment as to the quality of the content. This quality assessment was on a 0-4 scale, as described here:

- 0 - Not covered at all.
- 1 - Covered, but with no explanation and/or only link to outside source(s).
- 2 - Covered with minimal explanation.
- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

Any quality ratings of a 1 or 2 (as shown above) required a comment as to why it was given that rating. These comments could explain content that was missing in the coverage of that topic or further explanation that may be needed to fully explain the topic. A quality rating of a 3 or 4 meant that the reviewer felt the level of explanation for that topic was sufficient. See Appendix A for the survey instrument.

The survey provided both a quantitative review of how much content was covered, and a qualitative review of how well that content was covered. While the former is typically more objective and the latter is more subjective, it turns out that both of these were very subjective in this analysis. For instance, in some cases a reviewer might have said that a specific topic was covered while another reviewer may say that it was not covered. This mainly had to do with how strict a reviewer was about the inclusion of each topic (e.g., maybe the exact terms weren't used, but the overall intent of that topic was discussed). When there were discrepancies in whether the content was included, the two reviewers met to discuss the discrepancies, and the two reviewers discussed and came to a consensus as to whether that topic was included in the curriculum. More information on this process can be found in the Lessons Learned section.

Course Information

In addition to the pedestrian and bicycle content, the analysis also included looking at other considerations such as course cost, length, timeframe, delivery method (online, in-person, etc.), and testing method. Here is a summary of that information.

Cost

Of the courses for which data was available, over half cost between \$20 and \$100. Only one course, an in-person course available in multiple cities, had a cost significantly over \$100. One online course regularly had discounts available that made it more affordable. One online course, an example curriculum provided by a Texas licensing agency, was available online for free.

Length

The time requirement for completing the course was different depending on the type of course. Adult drivers ed curriculums on average took 6 hours to complete. New-driver or teen drivers ed courses all took 32 hours to complete the curriculum, in addition to behind-the-wheel instruction and observation. The length of time behind the wheel varied but all courses required at least 10 hours, and most courses required up to 44 hours. The defensive driving course took 5 hours to complete. Other courses did not have specific minimum hour requirements but took multiple hours to complete.

Time Commitment

Out of the courses we reviewed, only one in-person course was completed in a single sitting. Half of the courses were able to be completed at any time with no deadline, and the other 40 percent of the courses were multi-day courses.

Delivery Method

Of the courses we reviewed, one course required in-person attendance in a classroom setting. Most courses were to be completed at least partially online, and many were designed with both an online course and in-person driving instruction. Some curricula were oriented towards the student taking the course and others were written as guidelines for instructors. Of the curricula written as guidelines for instructors, all were reviewed online but many were designed as part of an in-person or partially online course.

Testing Method

All courses reviewed included some form of testing throughout, except one of the example curricula provided by a state agency. One course had only a single exam at the end with no additional testing. All other courses featured multiple chapter or course quizzes, and two courses included both multiple chapter/course quizzes and a large test at the end.

Results

Pedestrian Content

For pedestrian content, the reviewers were asked if the topics of crosswalks, right-of-way and traffic control devices were covered in the course content. Here is a summary of those findings.

Crosswalks

Figure 1 shows the percent of curricula studied that covered the topics under pedestrian crosswalks while Figure 2 includes the average quality ratings.

The topics reviewers were asked to look for were:

- Definition
- Locations
- Different types of markings
- Marked and unmarked
- Driver responsibility

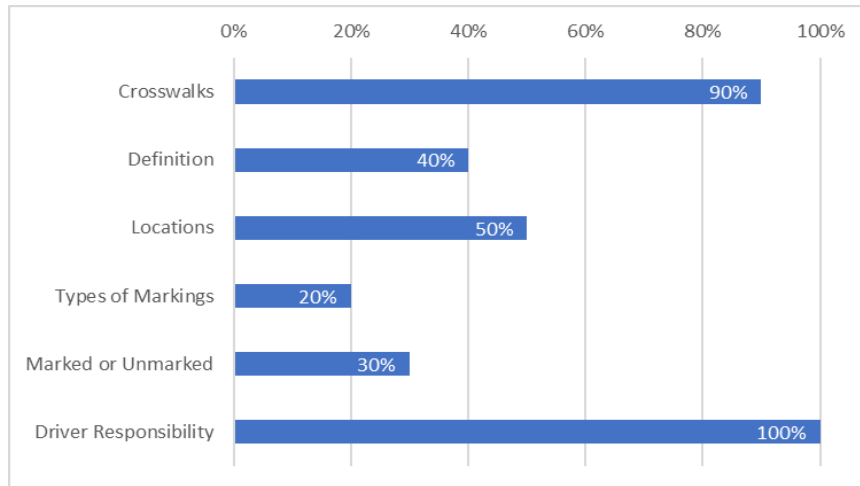


Figure 1. Pedestrian Crosswalk Coverage

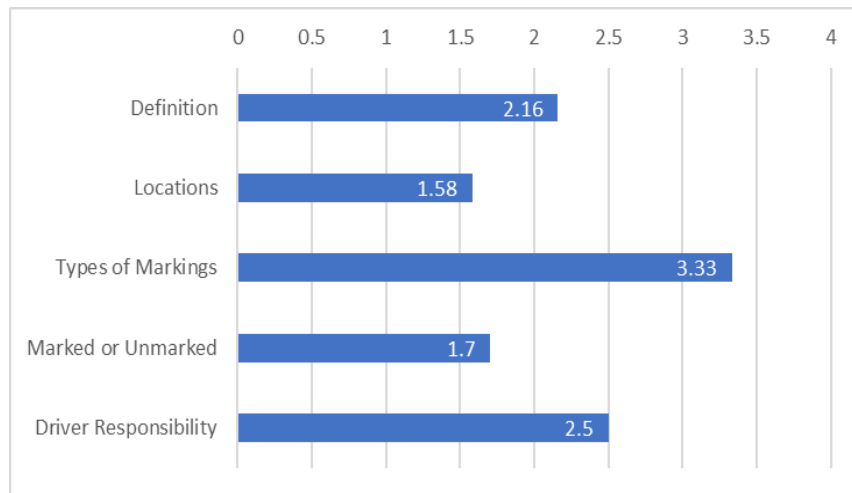


Figure 2. Pedestrian Crosswalk Topic Average Quality Ratings

As Figure 1 shows, almost all (90 percent) of the driver education curricula evaluated mentioned crosswalks. However, when researchers searched for the definition of a crosswalk, they found very few of the curricula reviewed provided a sufficient definition. A sufficient definition would be something that includes something as basic as a place designated for pedestrians to cross a road. A couple of reviewers mentioned that the curriculum they reviewed stopped short of providing the definition but hinted towards it. While others said the curriculum simply referred the student to the Texas Transportation Code language. It was also noted that in some cases we may not have received the full curriculum, such as the in-vehicle portions, and it is possible this would have been discussed there. Two of the curricula reviewed received the highest quality score of 4, and one received a score of 3. Of the ones that mentioned crosswalks, the average quality score was 2.16.

The next topic was about the locations where someone would find crosswalks. The intent of this question was to determine if curricula made it clear that crosswalks are located at all 4-way intersections and if they noted striped crosswalks could also be at midblock locations along a roadway segment. Reviewers discussed vague mentions of locations, but not comprehensive

coverage. They said it was mainly discussed in terms of intersections, with mid-block crosswalks not covered adequately in many cases. In some cases, the curriculum relied on pictures and provided little, if any, explanation. One of the curricula received a quality score of 3 (the highest score given), four received a score of 0 – not covered at all, and the remaining received a score of 1 or 2. The average quality score of those that did educate on crosswalk locations was 1.58.

Crosswalks come in different forms and striping patterns. Researchers sought to determine the quality of education related to the different types of markings. Two-thirds of the curricula reviewed did not cover these differences and received a score of 0. Of the remaining curricula, one received a quality score of 4, and two received a score of 3, resulting in an average score of 3.33 for those that did include information about the different types of crosswalk markings. There were no comments provided by the reviewers regarding the types of markings. The subject was either not covered at all or covered adequately in the curriculum.

In addition to different types of crosswalk markings, curricula were examined to determine the quality of the information provided regarding marked and unmarked crosswalks. The Texas Transportation Code (TTC) states that pedestrians have the right of way at both marked and unmarked crosswalks (TTC 552.005). Crosswalks are located at all legs of 4-way intersections even if the approach does not have striping. For midblock locations, crosswalk markings legally establish the crosswalk at non-intersection locations (Texas Department of Transportation, 2011). Half of the curricula reviewed did not cover marked and unmarked crosswalks. Of the remaining curricula that did cover marked and unmarked crosswalks, the average quality score was 1.7. Reviewers mentioned that unmarked crosswalks are hinted at, but that there was no visualization of what they might look like. Overall, reviewers said that this was not explained thoroughly or in enough detail to be helpful and there needed to be more awareness around unmarked crosswalks.

The final pedestrian crosswalks topic pertained to the responsibility of the driver at crosswalks. Drivers must stop and yield the right-of-way at crosswalks if a pedestrian is present. All of the curricula at least mentioned the driver's responsibility at crosswalks. The level of detail and explanation provided, however, was generally not adequate. An average quality score of 2.5 was achieved, meaning that detailed explanations along with examples and visuals were generally not included. Overall, reviewers' comments mentioned that coverage of driver responsibility was minimal. In one case, the students were told to look for and be aware of pedestrians but did not talk about the legal yielding and right-of-way requirements of the law. Some reviewers mentioned there was some confusion created by some curricula that said pedestrians have right-of-way even when they do not.

Right-of-way

Figure 3 shows the percent of curricula studied that covered the topics under pedestrian right-of-way while Figure 4 includes the average quality ratings.

The topics reviewers were asked to look for were:

- At intersections with traffic signals (no pedestrian signals)
- At intersections with pedestrian signals

- At intersections with no traffic signal
- Non-intersections (with a marked crosswalk)
- Non-intersections (without a marked crosswalk)

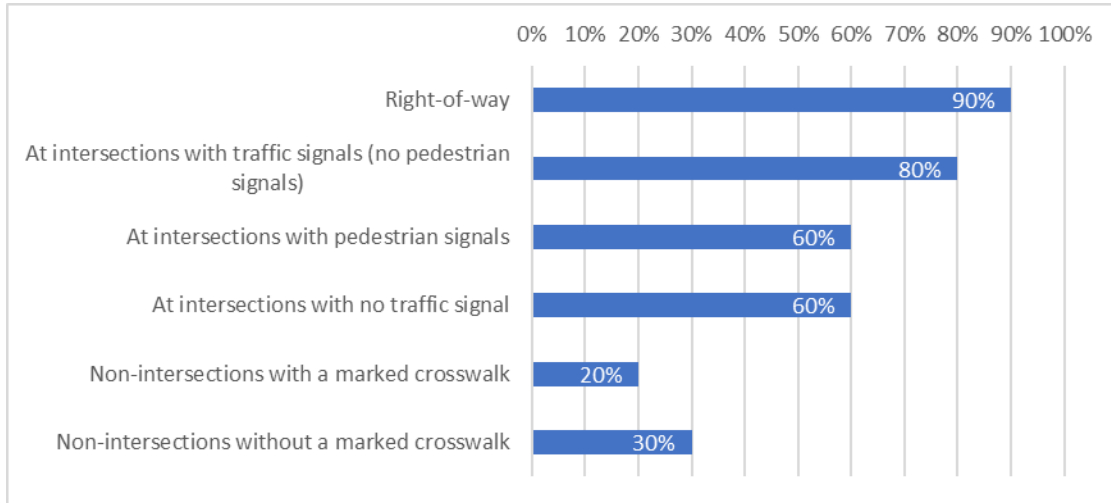


Figure 3. Pedestrian Right-of-way Coverage

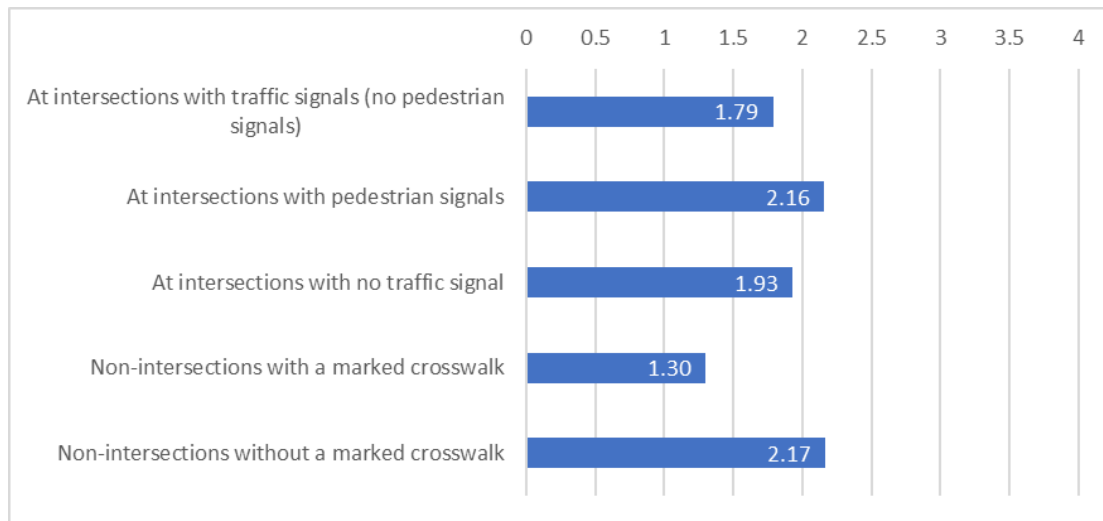


Figure 4. Pedestrian Right-of-way Topic Average Quality Ratings

All but one of the curricula covered right-of-way in some fashion; however, none covered all five of the topics with detailed explanation and example/visual depictions. The TTC states “A traffic control signal displaying green, red, and yellow lights or lighted arrows applies to a pedestrian” therefore a pedestrian facing a green signal at an intersection with no pedestrian signal may proceed across the roadway within a marked or unmarked crosswalk (Sec. 552.001.b) The first right-of-way subject reviewed was regarding what to do at intersections with traffic signals and no pedestrian signals is present. Most curricula had a quality score of 1 or 2 on this

subject providing little if any explanation. This resulted in a low average quality score of 1.79 for this topic.

The next topics were “At intersections with pedestrian signals” and “At intersections with no traffic signal” with 60 percent of the curricula covering these topics. For “At intersections with pedestrian signals” the TTC Sec. 552.002.b states “A pedestrian facing a "Walk" signal may proceed across a roadway in the direction of the signal, and the operator of a vehicle shall stop and yield the right-of-way to the pedestrian.” This topic averaged a quality score of 2.16. The third topic “At intersections with no traffic signal,” which refers to intersections with stop signs or yield signs, averaged a quality score of 1.93. The TTC 552.003 states that a pedestrian has right-of-way at a marked or unmarked crosswalk, and that marked or unmarked crosswalks are located at all legs of 4-way intersections. Some curricula did score a 3 or 4 on these topics therefore covering the topic well with detailed explanation and/or an example/visual.

The last two topics were the most underrepresented in the right-of-way section. These were “non-intersections with a marked crosswalk” at 20 percent and “non-intersections without a marked crosswalk” at 30 percent. For midblock locations, crosswalk markings legally establish the crosswalk at non-intersection locations (Texas Department of Transportation, 2011), yet for midblock locations without crosswalk markings where pedestrians do not have the right-of-way, TTC 552.005 states “A pedestrian shall yield the right-of-way to a vehicle on the highway if crossing a roadway at a place other than in a marked crosswalk or in an unmarked crosswalk at an intersection.” The average quality score for “non-intersections with a marked crosswalk” was 1.3, and we saw that the few curricula that did cover the topic, did not do so well. As for “non-intersections without a marked crosswalk” the average quality score was 2.17 providing minimal explanation but could be improved with detailed explanation and of use examples or visuals.

The comments from reviewers for the right-of-way section mainly centered on how the subject of right-of-way was discussed broadly, but with no explanation. When it comes to non-intersections specifically, some curricula did not discuss pedestrians and who has the right-of-way in this environment. Overall, the curricula do not get into the specifics about who has right-of-way (pedestrian or driver) in the above-mentioned circumstances.

Pedestrian Traffic Control Devices (TCD)

Figure 5 shows the percent of curricula studied that covered the topics under pedestrian traffic control devices while Figure 6 includes the average quality ratings.

The topics reviewers were asked to look for were:

- Pedestrian warning sign
- Pedestrian crossing sign
- Pedestrian hybrid beacon (PHB)
- Rectangular Rapid Flashing Beacon (RRFB)
- LED-embedded sign
- School crossing sign

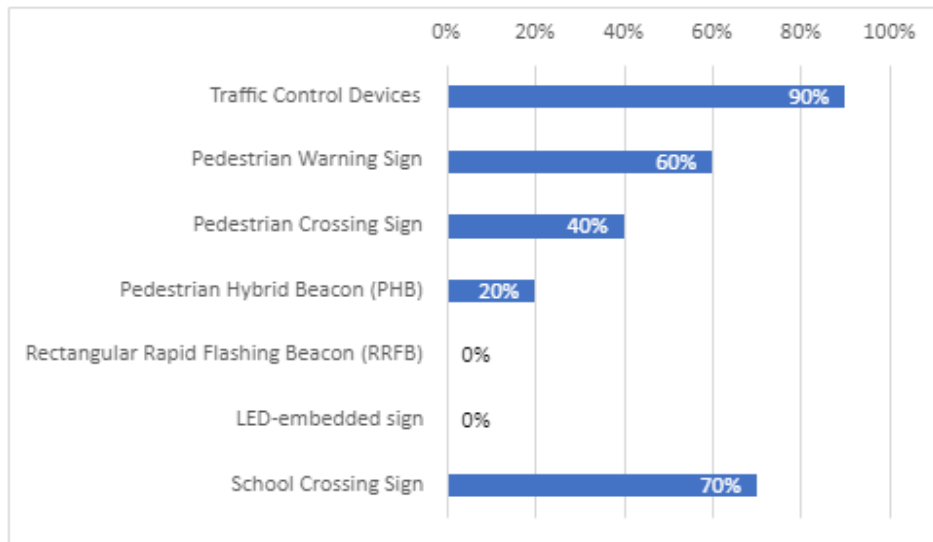


Figure 5. Pedestrian Traffic Control Device Coverage.

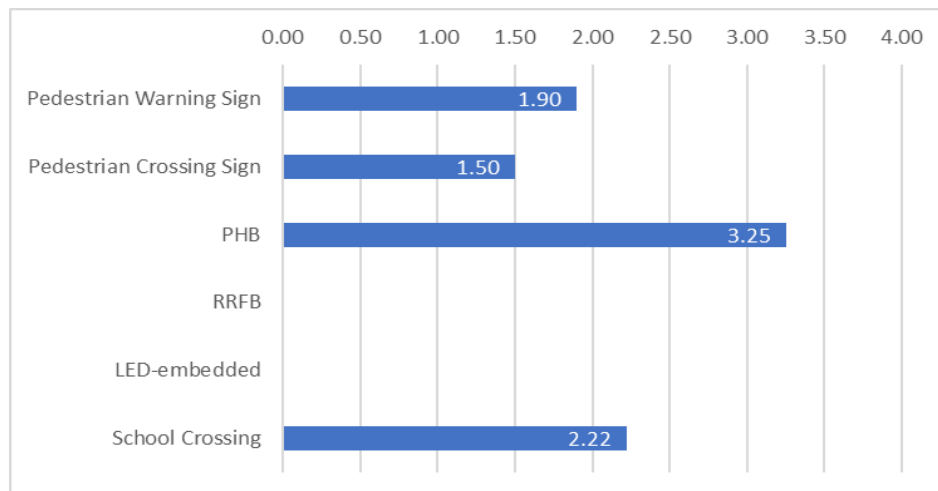


Figure 6. Pedestrian Traffic Control Device Topic Average Quality Ratings

All but one of the reviewed curricula included some coverage of traffic control devices (TCDs) pertaining to driver interactions with bicyclists and pedestrians. Pedestrian warning signs were mentioned in 60 percent of the reviewed curricula. The quality of coverage was mixed, with one or two of the curricula describing pedestrian warning signs with detailed explanations, but the rest with minimal to no detail, for an average quality score of 1.9. Pedestrian crossing signs were covered in 40 percent of the reviewed curricula. The quality of coverage for this TCD averaged a 1.5, with minimal to no detail provided on pedestrian crossing signs in the curricula that included them.

Pedestrian hybrid beacons (PHB) were mentioned in only 20 percent of the reviewed curricula. This is a relatively new technology that is not yet used in all communities, which may explain its scarcity in driver education materials. However, the curricula that did include PHB provided moderate to detailed explanations, with one curriculum including examples of the device; the quality of coverage for PHB in the curricula that included it averaged a 3.25.

Rectangular rapid flashing beacons (RRFB) and LED-embedded pedestrian signs, both sometimes used for pedestrian mid-block crossings and where low-volume side streets intersect with other roadways, were not covered in any of the reviewed curricula.

School crossing signs were the most frequently included TCDs, covered to some degree in 70 percent of the reviewed curricula. Quality of the coverage varied widely from no explanation of the sign to detailed explanation with visuals, for an average of 2.22 across the curricula in which it was mentioned.

Reviewer comments on traffic control device coverage mostly centered on lack of explanation in the curriculum about the message each device provides to the driver and about driver responsibilities, with the exception of one curriculum's more thorough coverage of the PHB. Reviewers also identified some pictures of outdated warning sign formats shown in some of the curricula.

Bicycle Content

For bicycle content, the reviewers were asked if bicyclist responsibilities, safe passing, dooring, hand and arm signals, traffic control devices and lane laws were covered in the course content. Here is a summary of those findings.

Figure 7 shows the percent of curricula studied that covered the topics shown while Figure 8 includes the average quality ratings.

The topics reviewers were asked to look for were:

- Bicyclist responsibilities
- Passing a bicyclist
- Dooring laws
- Hand and arm signals
- Bicyclist Warning Sign
- Bicyclist Crossing Sign
- Bicycle lane laws

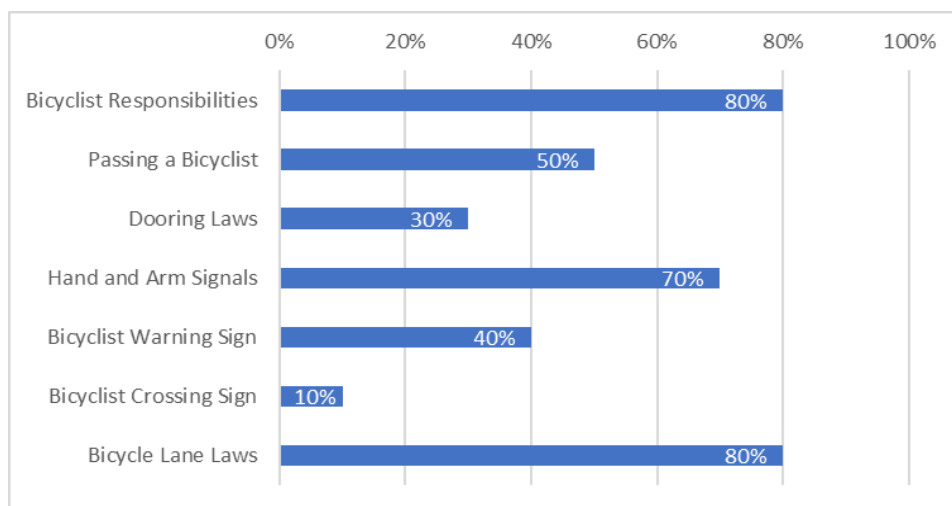


Figure 7. Bicyclist Topic Coverage

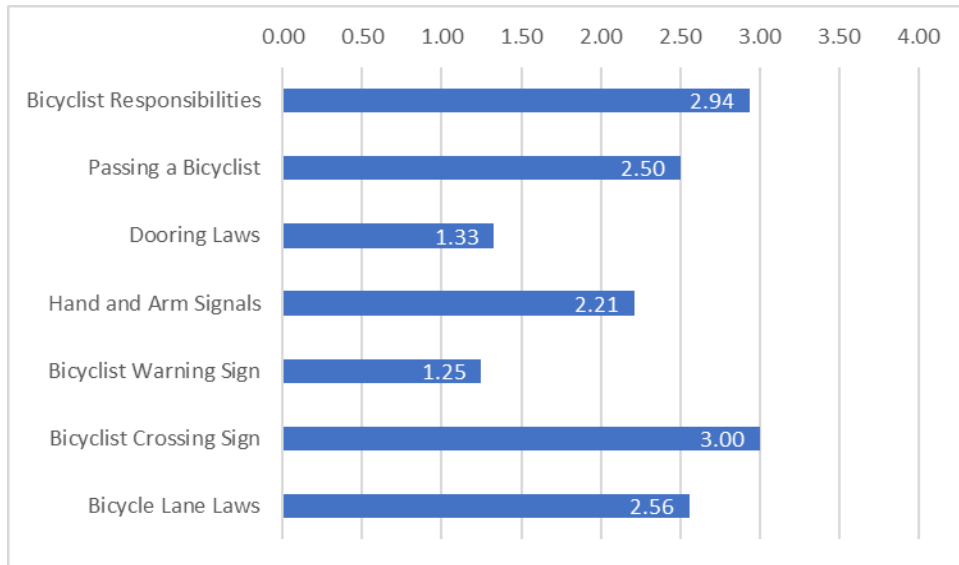


Figure 8. Bicyclist Topic Average Quality Ratings

In Texas according to the Texas Transportation Code, a “Bicycle” (TTC 541.201(2)) is defined as “a device that a person may ride that is capable of being ridden solely using human power and has two tandem wheels, at least one of which is more than 14 inches in diameter.” Per the Texas Transportation Code (TTC 551.101) bikes are considered a vehicle and thus have the same responsibilities and are entitled to the same rights of the road as that of a motor vehicle. Much like cars, bicyclists are required to slow down and come to a complete stop at stop signs and follow all traffic control devices including those signaling red. Drivers and bicyclists alike should be educated regarding their responsibilities and the rules of the road. In our analysis of the curricula, we observed that 80 percent of the curricula discussed “Bicyclists responsibilities” in some capacity. The quality of the coverage of this subject was relatively good, scoring an average of nearly 3 (2.94) in quality. Reviewer comments for these sections were mainly about the need for more explanation, examples, and visuals.

Although Texas does not have a law that sets a specific distance for a motor vehicle overtaking a bicycle, some cities have adopted safe passing ordinances. Motor vehicle drivers are however required to pass cyclists at a safe distance. Also, motor vehicle drivers may pass bicyclists heading in the same direction in a non-passing zone only when safe to do so. This is discussed under the subtopic of “Passing bicyclists” which was only covered in half of the curriculum with an average quality rating of 2.50. Some curricula only briefly mentioned safe passing distance, while others said to “watch out for” or “wait to pass until safe,” with no details about laws or best practices.

Due to the vulnerability of bicyclists on the road, drivers of motor vehicles need to heed caution and be courteous to bicyclists. One way to avoid crashes is through the enforcement and awareness of “Dooring Laws.” According to Texas Transportation Code 545.418, motorists are prohibited from opening their car doors on the side of the moving traffic unless it is reasonably safe to do so without disturbing the traffic. “Dooring Laws” were represented in 30 percent of curricula. The quality of the coverage for “Dooring Laws” was low with an average quality

rating of 1.33. Reviewer comments mostly said that the issue of dooring was discussed but not the law itself.

The Texas Transportation Code § 551.101, states that bicyclists should clearly indicate their intentions on the road through hand signals - Bicyclists must utilize hand signals when turning both left and right and when coming to a stop (TTC 545.107). “Hand and Arm Signals” which was discussed in 70 percent of the curricula had an average quality rating of 2.21. Reviewer comments mentioned that some curricula either only discuss the right turn hand signal or do not provide any detail about the hand signals at all.

Drivers must also yield when appropriate, adhere to signage, and respect bicycle lane laws. The most common signage drivers should watch out for are bicyclist warning signs, crossings and those associated with bike lanes. A “Bicyclist Warning Sign” is used to remind motorists to share the roadway with bicyclists. The “Bicyclist Warning Sign” was discussed in 40 percent of the curricula with an average quality score of 1.25. In many cases, the reviewers noted that the sign was simply displayed and not specifically discussed. A “Bicyclist Crossing Sign” is intended to warn drivers that bicyclists are likely to be crossing the road. When seeing this sign, drivers should slow down and be on the look-out for bicyclists entering and exiting the roadway. The “Bicyclist Crossing Sign” was only covered in one curriculum, however, the one curriculum that did cover this topic scored a 3.00.

In addition to the above responsibilities, bicyclists are required to ride in a bike lane when possible - it is imperative to note that while cars should stay out of bike lanes, bicyclists do not have to stay in the bike lane. These and other “Bicycle Lane Laws” were covered in 80 percent of the curriculum and scored an average of 2.56 amongst the curriculum that included this lesson. Reviewer comments discussed how some laws are mentioned, but the coverage is very brief and not comprehensive enough.

Overall, all but one of the curricula discussed the topic of bicyclists; however, this does not imply that the topic was thoroughly taught in all the curricula. None of the curricula discussed all seven of the topics; moreover, it is also important to highlight that one of the curricula did not discuss any of the seven topics.

Other Miscellaneous

Figure 9 shows the coverage of other miscellaneous topics in the curricula reviewed and Figure 10 shows the quality rating of that coverage.

Other miscellaneous content the reviewers were asked about were:

- Passing other vehicles stopped for a pedestrian
- What to do when you are in a stranded/disabled vehicle
- What to do when you are driving and see a stranded/disabled vehicle
- Other comments regarding the curriculum

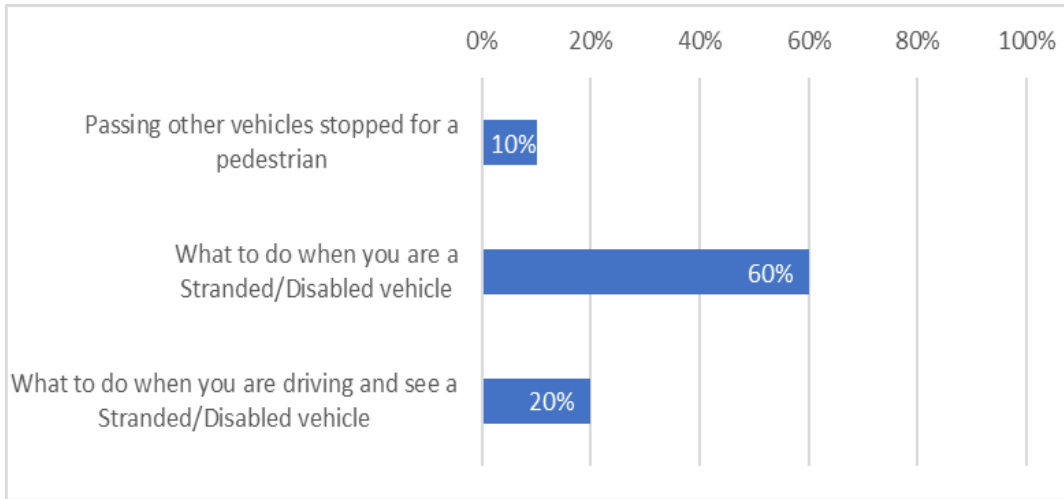


Figure 9. Other Miscellaneous Topic Coverage

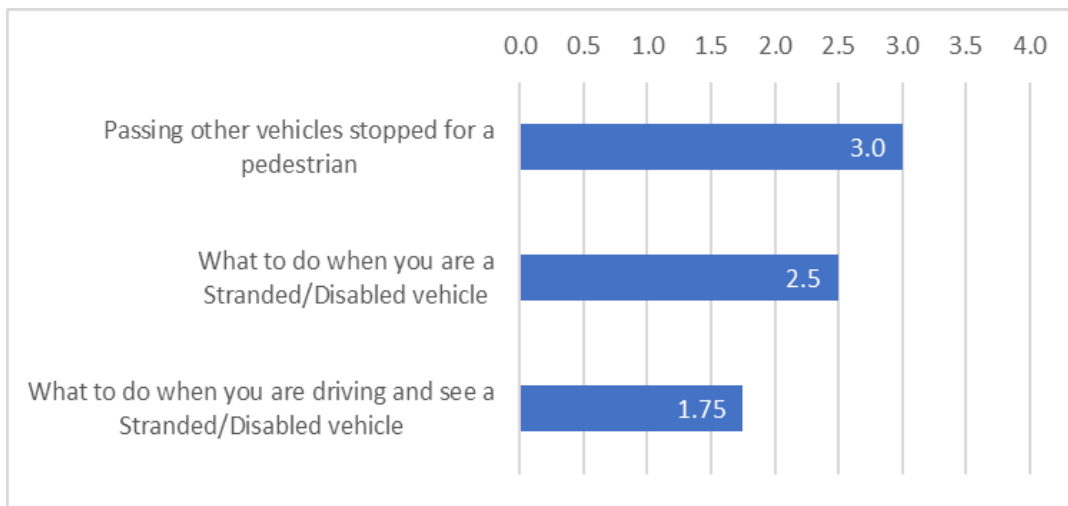


Figure 10. Other Miscellaneous Topic Average Quality Ratings

Out of the courses reviewed, 10 percent (or one curriculum) covered “passing another vehicle stopped for a pedestrian”, which received a quality score of 3.

Sixty percent of the curricula covered “what to do when you are a stranded or disabled vehicle.” For those courses for which a rating was provided, the average quality score for the topic was 2.5, with three of the courses covering the topic with a detailed explanation, and one course covering the topic, but with no explanation. One course had conflicting ratings because some information went against accepted guidelines and told readers to get out of their vehicle instead of remaining inside the vehicle, if possible. Therefore, the subject matter expert rated it a one, even though it was covered in detail and another reviewer rated it a 4 due to the detailed explanation. Reviewer comments showed that a few of the curricula reviewed went against accepted guidance and either told people to get out of their vehicle or showed people in a picture outside of their vehicle.

Out of the courses for which a rating was available, 20 percent covered “what to do when you are driving, and you see a stranded or disabled vehicle.” The average quality rating of the courses that covered the topic was 1.7. The curricula seem to concentrate on what to do if you are in a stranded or disabled vehicle, but not what to do if you see a stranded or disabled vehicle.

Finally, reviewers were able to make additional comments regarding the curricula. Many reviewers noted additional information that was not included in our survey but that they felt was relevant. These topics included information that was important for pedestrians but not directly relevant to drivers, such as regulations for public intoxication and pedestrian and bicyclist-specific warning signs. Others highlighted information that was relevant to drivers but not specifically accounted for in our survey, such as caution around blind pedestrians. Several reviewers noted that they were only provided with partial courses to review, so relevant pedestrian or bicyclist information that may have been provided elsewhere in the course or in supplemental material could not be accounted for.

Recommendations

Included here is a list of recommendations from the TTI reviewer team. This is followed by a detailed description of each recommendation.

List of recommendations:

- Pedestrians
 - Crosswalks:
 - Describe and show examples of unmarked crosswalks.
 - Describe and show examples of marked crosswalks at mid-block locations.
 - Updates to reflect changes in the Texas Manual on Traffic Control Devices (MUTCD).
 - Visuals of different crosswalk marking types.
 - Right-of-way
 - Examples and visuals of right-of-way scenarios involving pedestrians, motor vehicles and other vehicles (including bicyclists).
 - Traffic Control Devices
 - Specific descriptions of each TCD, including where drivers are likely to see it and what their responsibilities are.
 - Updated pictures of signs to match the current edition of the Texas MUTCD.
 - Inclusion of newer technologies such as the PHB, RRFB, and LED-embedded pedestrian crossing signs.
- Bicyclists
 - More visuals and examples, especially around bicyclist warning and crossing signs.
 - More information on dooring laws and safe passing.
 - Complete coverage of hand and arm signals

- Other
 - Information to drivers on why they should not pass a vehicle that is already stopped for a pedestrian.
 - Revised guidance on what to do if your vehicle is stranded or disabled.
 - Additional guidance on what to do if you are driving and you see a vehicle stranded or disabled.

It is fundamental that driver's education curricula describe and define crosswalks. Drivers must understand what they are, what they look like, where to find them, and appropriate driving behavior as required by Texas law. Unmarked crosswalks may be the most misunderstood by the general public (Johnson & Hudson, 2019). Although almost all of the curricula examined did mention crosswalks, most failed to mention the unmarked crosswalks that exist at all 4-way intersections. It is recommended that driver's education curricula include a description of unmarked crosswalks and ensure that operators understand that the same driver's responsibility is required for both marked and unmarked crosswalks.

Also recommended is ensuring that curricula mention and describe marked crosswalks located at non-intersections, or midblock locations. In 2021, the Texas legislature changed the law to require that drivers stop and yield to pedestrians in crosswalks. This new law needs to be reflected in the curriculum.

Other updates are recommended that reflect the latest Texas MUTCD. In particular, the crosswalk warning sign with crosswalk lines is no longer in the manual (see Figure 11) and needs to be replaced with the image in Figure 12. A downward arrow (Figure 13) is required to indicate that the location is an established crosswalk.



Figure 11. Outdated Pedestrian Crossing Warning Sign



Figure 12. Current Pedestrian Crossing Warning Sign



Figure 13. Downward Arrow and Supplemental Plaque for Pedestrian Crosswalk

It is also recommended to include the different types of crosswalk markings a motorist might encounter when driving, including but not limited to continental, standard, zebra, or ladder. Including a figure from the Texas MUTCD such as what is seen in Figure 14 is one option for addressing this recommendation.

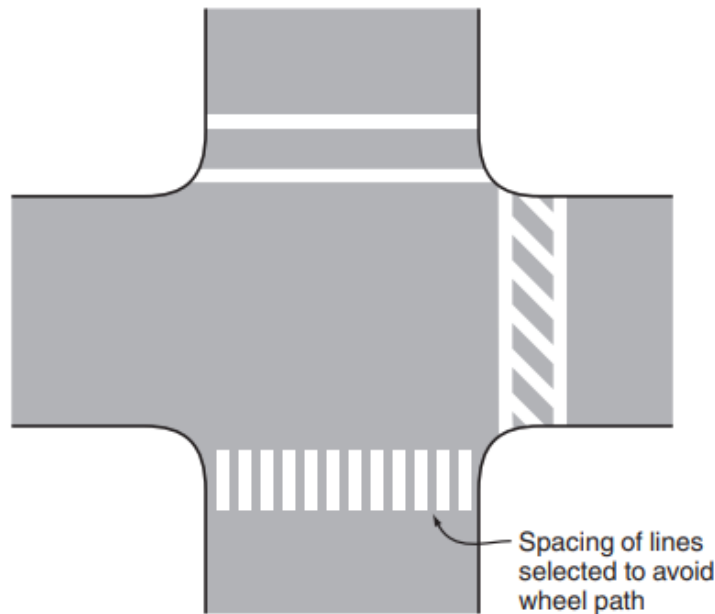


Figure 14. Examples of Crosswalk Markings (TxDOT, 2011, p. 406)

TTI recommends improvement in covering Right-Of-Way in curriculum. Findings suggest any coverage/explanation is missing from 40-80 percent of the curricula sample, and what is covered is done so minimally with no examples since all averaged a quality score of 2 or below. Examples and visuals are a great learning tool and TTI recommends those need to be incorporated for a topic like right-of-way where intersections can all look so different, and

common sayings exist which create confusion and impact culture norms like, “Pedestrians always have the right of way.”

More information on pedestrian-related TCDs would tie into improved Right-of-Way instruction, by teaching drivers what each warning sign (Pedestrian Warning vs Pedestrian Crossing vs School Crossing) means, where they would expect to see it, and how to respond. Updated warning sign pictures are vital, so that the signs on the road match the versions drivers have seen in the instruction materials. Drivers also need to know about the newer TCDs such as PHB, RRFB, and LED-embedded crossing signs that are appearing in more and more communities, including how to respond when these TCDs are activated,

Similar to the recommendation above it would be imperative to have more visuals, especially when discussing the “Bicyclist Warning Sign” and “Bicyclist Crossing Sign”. Additionally, the inclusion of information on laws regarding dooring, and safe passing should also be added and complete coverage of hand and arm signals that a bicyclist may use and what they mean. Each of these will educate drivers on things to be looking for and what they can do to make their interactions with bicyclists safer.

Furthermore, TTI highly recommends that the burden of education not only be emphasized for the bicyclists but should also be emphasized for drivers. In 2020 according to the National Safety Council, 806 bicyclists died in motor-vehicle related traffic crashes (National Safety Council), meaning that motor-vehicle traffic crashes should be considered high priority with both the motorists and bicyclists being cognizant of the laws.

Guidance to drivers on the reasons a vehicle may be stopped at an intersection or crosswalk, and to be extremely cautious when passing another vehicle that is stopped, because they may be stopped for a pedestrian that is crossing and that pedestrian may not see another vehicle approaching.

TTI recommends revising the guidance on what to do if your vehicle is stranded or disabled. A few curricula reviewed advised readers to get out of their vehicle, which goes against much of the current guidance. Additionally, TTI recommends providing guidance on what to do if you see another vehicle stranded or disabled on the side of the road so that a driver can provide a safer space for someone that has a stranded or disabled vehicle. Both of these items should be discussed specifically as it relates to high-speed roadways, such as rural highways and urban freeways and tollways. Many pedestrian fatalities occur on high-speed roadways each year when a motorist exits the vehicle to address a concern or assist others who have a disabled vehicle.

In terms of overall recommendations, be sure that the content included is not contradictory. In at least one case, a curriculum provided contradictory information, by cutting and pasting in information or quotes from different sources without providing explanation.

Following this report, TTI will be creating a supplementary curriculum that driver’s education providers in Texas can use to meet the recommendations in this report. TTI will also be producing a video that covers these missing or underexplained items.

Lessons Learned

There were several lessons learned through this activity and a summary of those are included below. To see additional insights provided by each reviewer, please see Appendix B.

One of the first lessons learned, was to consider how different reviewers may interpret the coverage of a specific issue in a curriculum. Many of the discrepancies between reviewers had to do with how strictly you are assessing the coverage of each criterion. It would be helpful to decide beforehand on some parameters, such as:

- If there are certain words or phrases that need to be included.
- Are broad mentions of a subject enough?
- How much detail is considered sufficient?

Also, having two people assess each curriculum (when possible) is a great way to make sure that all the information is captured. In some cases, the discrepancies between reviewers were oversights or mistakes in filling out the online form.

Other lessons learned came from the experiences of the reviewers. Overall, the reviewers saw this as an eye-opening and surprising exercise. There were mentions of missing material, lack of detail and unclear guidance. A couple even mentioned teaching to the test instead of providing the necessary information to safely operate a motor vehicle. There was also mention of how videos and visuals when used in curriculum seemed to provide a better learning experience. To see insights provided by reviewers, please see Appendix B.

References

- Johnson, N., Trueblood, A., Hudson, J. & Womack, K. (2021a). *Identifying Barriers to Understanding Pedestrian and Bicycle Safety Laws: Survey Findings Report*. Texas A&M Transportation Institute, for Texas Department of Transportation, project: 2021-TTI-G-1YG-0062.
- Johnson, N., Trueblood, A. & Shipp, E. (2021b). *Identifying Barriers to Understanding Pedestrian and Bicycle Safety Laws: Focus Groups Report*. Texas A&M Transportation Institute, for Texas Department of Transportation, project: 2021-TTI-G-1YG-0062.
- Johnson, N. & Hudson, J. (2019). *Pedestrian and Bicyclist Safety Outreach: FY2019 Grant Summary Memorandum*. Texas A&M Transportation Institute, for Texas Department of Transportation, project: 2019-TTI-G-1YG-0068.
- Johnson, N. & Hudson, J. (2022). *Identifying Barriers to Understanding Pedestrian and Bicycle Safety Laws: Survey Findings Report*. Texas A&M Transportation Institute, for Texas Department of Transportation, project: 2022-TTI-G-1YG-0023.
- National Safety Council. (2022, June 22). *Bicycle deaths*. Injury Facts. Retrieved April 12, 2023, from <https://injuryfacts.nsc.org/home-and-community/safety-topics/bicycle-deaths/#:~:text=In%202020%2C%20the%20most%20deaths,for%20Health%20Statistics%20mortality%20data>.
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- Texas Department of Transportation (TxDOT). (2011). *Texas Manual of Uniform Traffic Control Devices (TMUTCD)*, Revision 2, October 2014.
- Texas State Statutes. Texas Transportation Code. Retrieved from: <https://statutes.capitol.texas.gov/Docs/SDocs/TRANSPORTATIONCODE.pdf>

Driver Ed Curriculum Review

Start of Block: Curriculum Information

The Texas A&M Transportation Institute is doing a qualitative review of Texas' drivers' education curriculum to see what content is included regarding pedestrians and bicyclists and how the issues are covered. The Texas Department of Transportation sponsored the project Identifying Barriers to Understanding Pedestrian and Bicycle Laws in fiscal year 2023.

Fill out this form to the best of your ability while reviewing the curriculum. You may go forward and back to move to the section you are currently reviewing.

Name of Reviewer

Course Title

Who owns the course/delivers the course?

Cost of the course to the trainee (include a dollar amount)

If shared by company, what is the average length of the course (provide a time (minutes, hours, or days)

What is the time commitment for this course?

- All in one sitting
- Multi-Day
- Any time with no deadline

What is the course delivery method? (Select All)

- Virtual classroom
- In Person
- Online course

What's the course testing method?

- Course quizzes
- Chapter quizzes
- One test at the end
- None

End of Block: Curriculum Information

Start of Block: Pedestrian Criteria - Crosswalks

Select Yes or No if the topics below on Crosswalks were covered.

	Yes	No
Crosswalks	<input type="radio"/>	<input type="radio"/>
Definition	<input type="radio"/>	<input type="radio"/>
Locations	<input type="radio"/>	<input type="radio"/>
Different types of markings	<input type="radio"/>	<input type="radio"/>
Marked or Unmarked	<input type="radio"/>	<input type="radio"/>
Driver Responsibility	<input type="radio"/>	<input type="radio"/>

What is the quality level for the Crosswalk topic - The Definition?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

	0	1	2	3	4
Definition					

Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for the Crosswalk topic - Locations?

0 - Not covered at all.

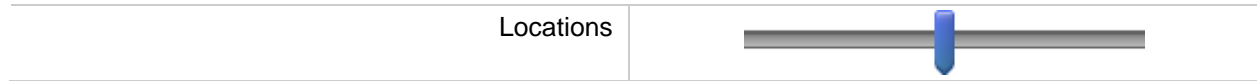
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for Crosswalk topic - Different Types of Markings?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for Crosswalk topic - Marked and Unmarked?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

- 2 - Covered with minimal explanation.
- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4

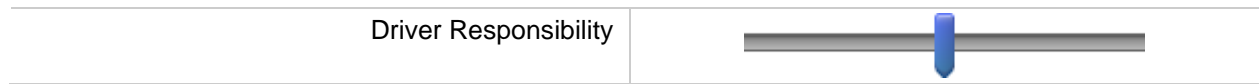


Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for the Crosswalk topic - Driver Responsibility?

- 0 - Not covered at all.
- 1 - Covered, but with no explanation and/or only link to outside source(s).
- 2 - Covered with minimal explanation.
- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

End of Block: Pedestrian Criteria - Crosswalks

Start of Block: Pedestrian Criteria - Right-of-way

Select Yes or No if the topics below on Right-of-Way were covered.

	Yes	No
Right-of-Way	<input type="radio"/>	<input type="radio"/>
At intersections with traffic signals (no pedestrian signals)	<input type="radio"/>	<input type="radio"/>
At intersections with pedestrian signals	<input type="radio"/>	<input type="radio"/>
At intersections with no traffic signal	<input type="radio"/>	<input type="radio"/>
Non-intersections (with a marked crosswalk)	<input type="radio"/>	<input type="radio"/>
Non-intersections (without a marked crosswalk)	<input type="radio"/>	<input type="radio"/>

What is the quality level for each Right-of-way topic?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4

At intersections with traffic signals (no pedestrian signals)	
---	--

Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for each Right-of-way topic?

0 - Not covered at all.

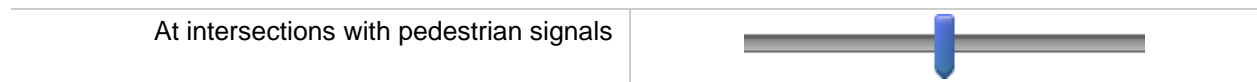
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for each Right-of-way topic?

0 - Not covered at all.

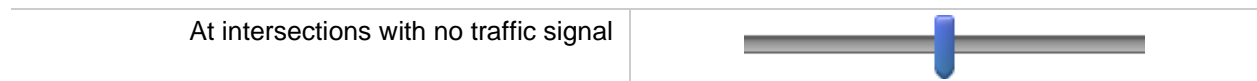
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for each Right-of-way topic?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for each Right-of-way topic?

- 0 - Not covered at all.
- 1 - Covered, but with no explanation and/or only link to outside source(s).
- 2 - Covered with minimal explanation.
- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

End of Block: Pedestrian Criteria - Right-of-way

Start of Block: Pedestrian - Traffic Control Devices

Select Yes or No if the topics below on Traffic Control Devices were covered.

	Yes	No
Traffic Control Devices	<input type="radio"/>	<input type="radio"/>
Pedestrian Warning Sign	<input type="radio"/>	<input type="radio"/>
Pedestrian Crossing Sign	<input type="radio"/>	<input type="radio"/>
Pedestrian Hybrid Beacon (PHB)	<input type="radio"/>	<input type="radio"/>
Rectangular Rapid Flashing Beacon (RRFB)	<input type="radio"/>	<input type="radio"/>
LED-embedded sign	<input type="radio"/>	<input type="radio"/>
School Crossing Sign	<input type="radio"/>	<input type="radio"/>

Pedestrian Warning Sign

What is the quality level for this Traffic Control Device - Pedestrian Warning Sign?

0 - Not covered at all.

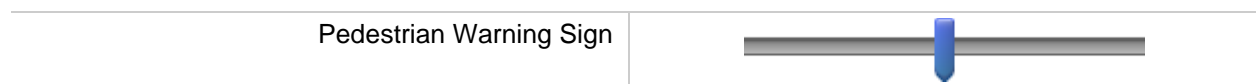
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

Pedestrian Crossing Sign

What is the quality level for this Traffic Control Device - Pedestrian Crossing Sign?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

Pedestrian Hybrid Beacon (PHB)

What is the quality level for this Traffic Control Device - Pedestrian Hybrid Beacon (PHB)?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



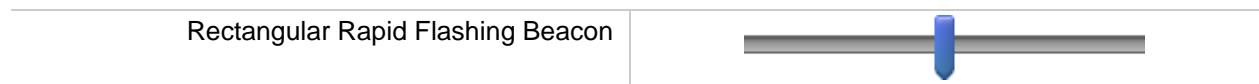
Any items ranked 1 or 2, please provide a comment as to why.

Rectangular Rapid Flashing Beacon (RRFB)

What is the quality level for this Traffic Control Device - Rectangular Rapid Flashing Beacon (RRFB)?

- 0 - Not covered at all.
- 1 - Covered, but with no explanation and/or only link to outside source(s).
- 2 - Covered with minimal explanation.
- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

LED-embedded sign

What is the quality level for this Traffic Control Device - LED-embedded sign?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

School Crossing Sign

What is the quality level for this Traffic Control Device - School Crossing Sign?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

End of Block: Pedestrian - Traffic Control Devices

Start of Block: Bicyclists

Select Yes or No if the topics below on Bicyclists were covered.

	Yes	No
Bicyclists' Responsibilities	<input type="radio"/>	<input type="radio"/>
Passing a Bicyclist	<input type="radio"/>	<input type="radio"/>
Dooring Laws	<input type="radio"/>	<input type="radio"/>
Hand and Arm Signals	<input type="radio"/>	<input type="radio"/>
Bicyclist Warning Sign	<input type="radio"/>	<input type="radio"/>
Bicyclist Crossing Sign	<input type="radio"/>	<input type="radio"/>
Bicycle Lane Laws	<input type="radio"/>	<input type="radio"/>

What is the quality level for the Bicyclist topic - Bicyclists' Responsibilities?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for the Bicyclist topic - Passing a Bicyclist?

- 0 - Not covered at all.
- 1 - Covered, but with no explanation and/or only link to outside source(s).
- 2 - Covered with minimal explanation.
- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for the Bicyclist topic - Dooring Laws?

- 0 - Not covered at all.
- 1 - Covered, but with no explanation and/or only link to outside source(s).
- 2 - Covered with minimal explanation.
- 3 - Covered with detailed explanation.
- 4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for the Bicyclist topic - Hand and Arm Signals?

0 - Not covered at all.

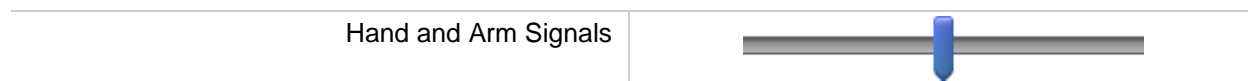
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

Bicyclist Warning Sign

What is the quality level for the Bicyclist topic - Bicyclist Warning Sign?

0 - Not covered at all.

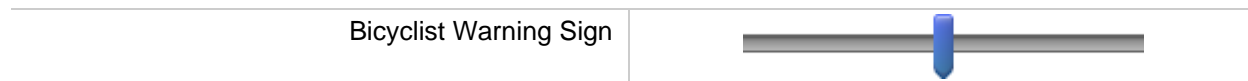
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

Bicyclist Crossing Sign

What is the quality level for the Bicyclist topic - Bicyclist Crossing Sign?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for the Bicyclist topic - Bicycle Lane Laws?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

End of Block: Bicyclists

Start of Block: Miscellaneous - Pedestrian and Bicyclist

Select Yes or No if the topics below were covered.

	Yes	No
Passing other vehicles stopped for a pedestrian	<input type="radio"/>	<input type="radio"/>
What to do when you are a Stranded/Disabled vehicle	<input type="radio"/>	<input type="radio"/>
What to do when you are driving and see a Stranded/Disabled vehicle	<input type="radio"/>	<input type="radio"/>

What is the quality level for the topic - Passing other vehicles stopped for a pedestrian?

0 - Not covered at all.

1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4

Passing other vehicles stopped for a pedestrian



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for the topic - What to do when you are a Stranded/Disabled vehicle?

0 - Not covered at all.

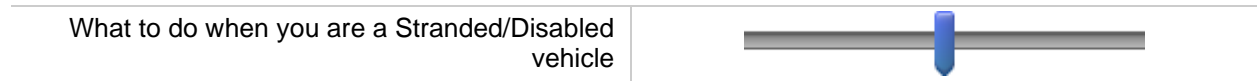
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

What is the quality level for topic - What to do when you are driving and see a Stranded/Disabled vehicle?

0 - Not covered at all.

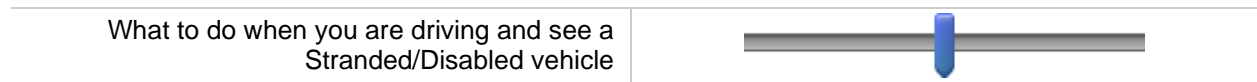
1 - Covered, but with no explanation and/or only link to outside source(s).

2 - Covered with minimal explanation.

3 - Covered with detailed explanation.

4 - Covered with detailed explanation and examples or visuals.

0 1 2 3 4



Any items ranked 1 or 2, please provide a comment as to why.

End of Block: Miscellaneous - Pedestrian and Bicyclist

Start of Block: Additional Information

Please add in any additional information not covered in the above that may be relevant.

End of Block: Additional Information

Appendix B

Reviewer Narratives

Reviewer 1 – Examining driver’s education curriculum was quite eye-opening and somewhat surprising. Pedestrian and bicyclist safety depends largely on the behavior of motor vehicle operators. As such, drivers must learn the meaning of pedestrian and bicyclist signs, signals, and markings. It was surprising how much is missing or outdated in the curricula that was reviewed. In some cases, information about pedestrians and bicyclists was included in sections directed toward those non-motorized users instead of toward the driver. Also, when motor vehicles break down, have a flat tire, or are involved in minor crashes, the information is sometimes conflicting. Standard and clear direction should be given such that motorists know what to do if and when they have a vehicle concern on a high-speed roadway where getting out of the vehicle could be deadly.

Reviewer 2 - Overall, I really enjoyed going through these and I learned a lot through them. I feel like there is not much information at all on bicyclists, and very little on pedestrians. I feel like the only thing really mentioned about pedestrians is when it comes to right-of-way, and crosswalk encounters. There was not much information or pictures provided on the pedestrian and bicycle warning signs, as well as the LED signs. One specific curriculum had a lot more information on pedestrian and bicycle related issues than the others. I really enjoyed going through these!

Reviewer 3 – It was very surprising how much content seemed to be missing from the curricula we reviewed. In some cases, the content seemed to just “teach to the test” instead of providing information on laws, skills and driving situations a new driver might encounter, especially as it concerns pedestrians and bicyclists. I was also disappointed to not see as much of an emphasis as I would like to see on the responsibility that drivers take on when driving a motor vehicle. However, I was very glad to see the use of video and pictures in many curricula that goes beyond just writing out the information and can help students understand the content better.

Reviewer 4 - While reviewing the curricula, what surprised me the most was the lack of detail for many of the categories we looked at. In my experience cyclists usually received more attention than pedestrians, but both topics were under-discussed, and traffic control devices were rarely covered beyond the most common signs and signals. Several courses I reviewed seemed more interested in preparing students to pass the driving test than teaching students about specific laws and scenarios that they might encounter on the road, particularly regarding pedestrians and bicyclists. While the information itself was sometimes incomplete, I was impressed with the ways in which some courses used video to demonstrate their lessons for students, which made the lessons much easier to understand for courses with no in-person driving requirement.

Reviewer 5 – In reviewing the curriculum I thought back to how I was educated when learning to drive, the rigor or lack thereof and the content and the practice test questions I would review over and over again to pass the written test. I also thought of my own experience as a runner and cyclists and the information I needed to brush up on to keep myself safe on the roads. However,

admittedly when reviewing some of the curricula it made me worry for the safety of those sharing the roadway, especially the vulnerable users such as other pedestrians and cyclists. While some of the curricula would show a topic they did not go into significant detail or explanation. I felt that the burden of safety was put more on the vulnerable users of the roadway rather than the drivers. Some of the curricula would show a picture with no description which made us wonder if that could be considered “teaching.” I would have liked to see more descriptions and diagrams. In the curriculum I reviewed there was no reinforcement of the text, thus the learning and retention could be very limited. I would like to see more visuals and quiz questions to assist learning and retention of the information. Overall, I felt that drivers should be better educated and the dangers of running over a cyclist or pedestrian be better discussed. Also, diagrams should be more readily used as some technical roadway situations can be quite complicated and a diagram could be very helpful.

Reviewer 6 - This experience of reviewing drivers' education curricula was very eye opening. I was surprised by the variance in topic areas covered, cost of training, and how they were covered. The lack of consistency is worrisome knowing that Texas drivers get all different types of education on driving safely around pedestrians and bicyclists. Some had visuals and some had none, and some visuals did not even show the pedestrian or bicyclist exhibiting safe behaviors (i.e., not wearing a helmet). I was also concerned by the lack of transparency from some organizations to hand-over their curricula, in detail. Not just because it made it difficult for us to scan for educational areas covered, but because it makes you question these groups' methods for planning, documenting, and delivering the curricula. Without standardization, the well-developed (i.e., videos, visual, course quizzes, etc.) training, which may only be afforded by some and not afforded by others, makes me wonder if Texas is creating disparities in education and crash risk.