BLOG June 8th, 2023

PREMIER WIRELESS™

Mission Impossible?
Driving Down Costs While Improving School Bus Safety

In today's culture, school safety is a hot topic for students, parents, and administrators alike. What often gets left out, however, is school bus safety. It seems like all too often, when school buses are discussed, the topic is budget cuts. How, then, do we increase school bus safety when districts across the country are slashing school transportation budgets?

Why is it that we can track our take-out food order through each stage of its delivery right up to our doorstep, but we can only guess where our children are during school transit times? In fact, for most parents, unless they physically put their child on the bus, they don't know for sure whether the child got on the bus or whether they are safely on their way to school. Then, depending on the school, they must wait until they get a notification that the child has been checked in for the day, or worse, the message that their child is not at school. How is it that we have the resources to track our fast food in real-time, but we still aren't ensuring the safe and transparent delivery of our children?

Student Ridership Technology

The reality is that most school districts lack student ridership technology on their school buses. While a large percentage of buses may be equipped with GPS, there are still far too many that do not have it, and there are disproportionately fewer buses equipped with GPS technology in rural America. GPS, student ridership, and internet access are three school bus technologies critical to increasing school bus safety.

Accurate and real-time student ridership software should be a component of every school district's safety communication plan, particularly when considering the safety of our youngest school bus riders. Giving school administrators, parents, and bus drivers the ability to know where the student boarded and disembarked the bus on any given day not only brings peace of mind but ensures students are transferred safely between home and school in a seamless and transparent manner. Students getting on the wrong bus at school or getting off at the wrong stop on the way home becomes virtually impossible with student ridership technology. Furthermore, if a parent calls, the school immediately knows if the student rode the bus that day. Additionally, if it appears that a student is missing, school districts with student ridership technology can provide a last known/last seen location to focus parents' and law enforcement's search area, rapidly concentrating resources on the area the child will most likely be located, and reducing the time spent unnecessarily looking in places the technology advises they likely won't be found. School buses equipped with internet access can immediately log into their camera system to see who the student got off the bus with, which way they headed, and if there was anyone waiting around the bus stop, potentially providing even more information about the missing child's whereabouts.

Real-Time GPS Technology
GPS on school buses is a critical element of school bus safety. The ability to identify and track the bus allows the transportation department as well as public safety personnel, to locate a bus anywhere, at any time immediately. In addition to providing real-time location data, this route-tracking safety solution provides speed monitoring, stop reports, and geo-fencing, complete with real-time alerts. Any bus traveling outside its expected route will automatically notify the transportation department, creating instantaneous feedback to fleet managers who are ready to initiate school safety communication protocols. It can also minimize bus driver stress by keeping the bus on course and preventing drivers from getting lost by using turn-by-turn driving directions.

The Wi-Fi Connectivity
Adding internet access to school buses provides real-time situational awareness when connected to a district's network-enabled camera system. It can permit law enforcement to see what's happening in real-time or a principal to remotely access the camera system and play it back to see what occurred on the ride to or from school. It can also be used for contact tracing in accordance with school safety plans. Combined, these technologies reduce disciplinary issues and deter vandalism, resulting in safer environments for student riders and bus drivers. Furthermore, when GPS technology is paired with student ridership software and Wi-Fi, it enables real-time video surveillance of a highly dynamic environment both on and around the school bus during an emergency.

Anecdotally, long school bus commutes have been disadvantageous for students, specifically regarding academic outcomes and school-life balance. But when school buses are equipped with Wi-Fi technology, long rides or combined routes can offer students extended learning time. Students can research a project or get their homework done before they even get home. If we consider our most rural students, they struggle the most with access to high-speed broadband connectivity. For their long commutes, wouldn't it be ideal for them to have Wi-Fi on the school bus, so they can continue to have access to educational resources beyond the school day? Some students may not have reliable connectivity at home, so this may be their only opportunity to get school-work done outside of school hours or while off campus. For Alvin Independent School District in Texas, adding Wi-Fi to their 250 buses allowed students to use the extended travel time to and from school to study, research, and complete their homework. Previously, without connectivity at home, these students' homework assignments

were not being completed. For students, Wi-Fi on buses translates to better utilization of their time: additional studying and learning time on the bus and a better school-life balance at home with time for socializing and extra-curricular activities. Students won't have to stay up late completing homework; they'll be able to get enough sleep which is crucial to growing youth, as is being fully present and awake to learn at school the next day and succeed on school tests. Ultimately, these students will achieve higher scores and be healthier and happier children and young adults.

The Budget

With all the benefits school bus Wi-Fi, real-time GPS, and student ridership can offer directly to students, administrators, and parents, why isn't this technology in place already? Why do districts do nothing and settle for outdated safety standards set decades ago? The quick and easy answer: the budget. And more specifically, budget cuts. But what if this technology could pay for itself?

Unfortunately, at first glance, budget cuts for school transportation would seem to prohibit additional safety solutions from being adopted that go beyond the minimum safety standards. After all, budget cuts traditionally mean lessening or reducing, not adding technology. In that sense, it often seems like the quick and easy solution to cutting costs is to terminate routes or increase the walking perimeter around a school. While these may turn out to be suitable options, there are other steps transportation directors may want to take to save costs. An accurate and purposeful evaluation of the school bus fleet and all its routes will highlight the best way to reduce costs while still ensuring the safety as well as convenience of the riders.

By analyzing the data, a student ridership platform provides for each stop on each route; school bus fleets can lower costs by efficiently and effectively optimizing routes. This could mean maximizing ridership on each route and combining routes, relocating or removing stops, or re-routing existing bus routes. Hard-working, well-intentioned transportation teams simply cannot evaluate the plethora of data involved in making these high-level, evidence-informed, cost-saving decisions. The technology responsible for route optimization leverages accurate student ridership data to save districts thousands of dollars by reducing vehicle maintenance, fuel, and labor. This is exactly what happened for the Somerset Independent School District. Through careful analysis of their actual student ridership data, four routes were eliminated, ultimately saving the district nearly $1M over five years – Read more about that case study now!

The History of School Bus Safety

Cost-effective, modern technology can improve school bus safety as well as improve relationships with parents, making them and their children feel safer. Many parents want access to a parent app that lets them see where their child's bus is and when their child gets on and off it. Principals and other school officials want real-time camera access to resolve issues faster and with an accurate understanding of what is or was happening on the school bus. Also, school transportation directors are short-staffed yet spend hours every week gathering hard drives so they can download the data that's been recorded. The current system is outdated, inefficient, and lacks usability. Yet far too many schools hesitate to move forward, viewing technology as more of an unnecessary expense rather than as an investment in safety.

It's not without good reason that school buses are considered safe. For a myriad of reasons, school buses provide an exceptionally safe way to travel to school. According to the National School Transportation Association (NSTA), school transportation represents the largest form of mass transportation in the United States, as school buses outnumber all other forms of public transportation vehicles by almost 3.5 to 1. To quantify this, each day, 480,000 school buses transport 26 million or 55% of all schoolchildren to and from school. While many factors come into play, it is estimated that student riders spend at least 20 hours every month on the school bus, with rural students and athletes spending considerably more time, as much as 60 – 100 hours on the bus each month. With so many children spending so much time on school buses, there is much more we can do to ensure they are as safe as they can be, especially if an emergency arises.

"School buses are the most regulated vehicles on the road."

The National Highway Traffic and Safety Administration (NHTSA) estimates that student riders are 70 times safer than those who travel to school by car "because [school buses] are the most regulated vehicles on the road; they are designed to be safer than passenger vehicles." Due to "compartmentalization," students are protected from crashes by strong, closely spaced seats that have energy-absorbing seat backs. From NHTSA's 2014 report of youth fatalities that occurred during school travel hours between 2005 and 2013, less than 1% took place while riding on a school bus.

It is more than reasonable to conclude that school buses are a safe means of transportation for schoolchildren, at least as far as their mortality is concerned. But what about crashes that occur where students may or may not be harmed? What about a mechanical issue that causes the bus and all the students to be stuck on the side of the road waiting for alternative transportation? What about bullying? What about medical emergencies? What about students getting off at the wrong stop or being left on the bus at the end of the route? What if a bus is hijacked? What if there's an active threat incident on the bus? These are the safety concerns of the 21st century, yet many school transportation departments have not advanced their safety measures beyond the minimum standards set decades ago. Change comes slowly to the yellow school bus, but over the past 100 years, school transportation has evolved, and with it, safety improvements occurred in the 1930s, 1970s, and 1990s.

Prior to the 1930s, school bus safety standards did not exist. In fact, school buses came in various shapes and sizes and many times weren't even buses. Back then, students were riding in trucks and even horse-drawn wagons. The change began in 1937. With $5000 ($109,000 in 2023) from the Rockefeller-backed General Education Board, a two-year study was conducted on school bus needs across ten states. In 1939, transportation officials from every state in the US gathered to discuss school bus safety standards. Some of the 44 standards discussed at the conference included school bus body lengths, ceiling heights, door specifications, and aisle widths.

One of the quintessential safety standards decided at the 1939 conference was school bus color. Yes, the color was chosen with safety in mind. A small group of representatives from the bus manufacturing industry had 50 colors presented to them that ranged from lemon yellow to deep orange-red. While they may not have fully comprehended the science behind it, the orangish-yellow color they chose maximizes the eyes' ability to perceive color. Without getting too technical, yet still backed by ophthalmologists, the spectral wavelength for Color 13432 (in the Federal Standard 595a color collection that GSA uses for government procurement) makes

it hard for other drivers to miss a school bus, even in their peripheral vision. The "National School Bus Glossy Yellow" or the more linguistically favorable "school bus yellow" chosen at the 1939 conference has been the industry standard ever since. Other standards have evolved over the years, with the last major structural changes occurring in 1977, according to the National Association for Pupil Transportation (NAPT). The major changes were to the bus itself, namely to the fuel tank, to integrity, to the seating requirements, and to rollover protection. Those new standards were also provided for wheelchair-equipped buses and other disability-related access on conventional school buses.

Other noticeable improvements to school bus safety include flashing lights and retractable stop-arms that have been required since 1991. To go along with these physical changes added directly to the school bus, additional regulations have been adapted to ensure student safety. For example, it is illegal in every state to pass a school bus while the stop arm is extended and the red lights are flashing. Since 1992, bus drivers have been required to carry a commercial driver's license, and since 1996, they must pass a federal drug test. These and other safety solutions enacted over the years have proven effective. But preventing children from death while riding the school bus doesn't go far enough.

In Conclusion
Real-time GPS, student ridership software, internet access, and bus Wi-Fi are purposefully designed and integrated to simultaneously increase school bus safety, reduce expenses, and improve students' academic success. They are the safety improvements necessary for the 21st century and are a win-win solution for all.

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