

TRANSFORMING SCHOOL BUS OPERATIONS.

How modern telematics
enhances safety, maintenance,
and fleet sustainability.



T T-MOBILE
FOR EDUCATION

GEOTAB®

Transform your school bus fleet with T-Mobile for Education and Geotab.

This guide explores three areas in which telematics from our technology partner Geotab can make significant differences in safety, maintenance, and sustainability, as well as clean fuel conversions, for today's school bus fleets. Monitor your fleets in real time as they run routes far and wide with help from the powerful T-Mobile network.

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The benefits of a modern telematics solution for school bus fleets.

School buses represent the largest public transportation fleet in the United States—two- and-a-half times larger than all the rest of the nation’s public service vehicles combined.¹ More than 480,000 school buses transport nearly 26 million students to school and back each year.² This impressive scale is completely dependent upon the drivers, fleet managers, transportation directors, and superintendents, whose hard work makes it happen like clockwork—twice a day, every day of the school year.

Regardless of how hard an organization’s staff works, K–12 education in this country is facing external challenges. Vital Elementary and Secondary School Emergency Relief Fund (ESSER) financing came to an end in September 2024, despite many school districts still needing ESSER funds. Meanwhile, many school districts are plagued by chronic student absenteeism.³ These challenges and others have culminated in an increased push for school districts to adopt electric school buses, following evidence of the negative effects of diesel fuel on student health and academic outcomes.⁴

Fleet administrators and drivers must answer these challenges while still pursuing their primary goals of keeping students safe and transporting them to and from school on time.

¹New York School Bus Contractors Association, School Bus Fast Facts . . . spread the news! 2024

²K-12 Dive, 8 K-12 trends to watch in 2024, January 2024

³The White House, Chronic Absenteeism and Disrupted Learning Require an All-Hands-on-Deck Approach, September 2023

⁴World Resources Institute, The State of Electric School Bus Adoption in the US, July 2024.

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CHAPTER ONE

Four ways Geotab promotes safer student transportation.

1. Develops safer operations with driver-behavior monitoring and coaching.

When parents send their children to school, they expect their kids to be safe on the bus ride there and back. Unfortunately, no matter how careful the driver, accidents and road violations happen. One [review](#) found that school bus drivers are more likely to have committed traffic violations or made errors that resulted in collisions, when compared to non-school bus drivers.¹

It's impractical to have administrators constantly monitoring bus driver performance and one-off administrator ride-alongs aren't likely to accurately showcase a driver's performance. **To promote good driver behavior and keep students safe, K-12 administrators need an automated solution to monitor bus driver behavior.**

Geotab monitors bus driver safety.

With Geotab, administrators can keep an eye on bus driver behavior without wasting valuable time and resources.

The Geotab GO device features built-in accelerometers and gyroscopes that gather data on risky driving practices, like hard cornering, harsh braking, speeding, and rapid acceleration. These data points flag unsafe driving events and notify administrators and fleet safety managers. With this data, admins can identify the riskiest drivers in the fleet, monitor fleet safety in real time, and view a report of risky driving events. Once they have this information they can create a coaching plan that is customized to the drive.



Key monitoring telematics features:

- **In-vehicle alerts.** Alerts sent while an operator is driving to help self-coach and reinforce safe driving habits.
- **Gamification.** To promote buy-in among bus drivers, implement gamification applications like driver scorecards. Friendly competition between drivers can motivate them to be the safest driver in the fleet.
- **Curve-based logic.** Curve-based logic gathers data throughout the entirety of a driver's trip, not just data at fixed points in time, allowing for more effective reporting on historical data and further insights into driving patterns as new questions arise.

¹Journal of the Transportation Research Forum, Factors Contributing to School Bus Crashes, 2013

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What is curve-based logic?

Some telematics solutions capture driver data by taking a snapshot of basic vehicle information, such as speed or location, every 30 seconds. But a lot can happen during those 30-second intervals: road violations, accidents, or making smart, safe maneuvers to avoid accidents.

With Geotab's curve-based logic algorithm, comprehensive data is captured and evaluated on every detectable vehicle factor—like speed, heading, accelerometer data, and engine data. When a significant change is detected in the live data, the information is logged and transmitted to the server as often as required to accurately illustrate vehicle activity.

Curve-based logic helps protect your students, drivers, and institution.

Thanks to curve-based logic, Geotab can gather more accurate data from your bus drivers in four key ways:

1. **Critical moments are collected**, providing valuable information for training, driver quality assessments, and legal matters.
2. **Data is handled more efficiently**, so users can apply new algorithms to historical data and see results quickly and easily.
3. **Complete accident reconstruction is enabled**, which protects the driver and the school district from false claims.
4. **Unreported accidents and damages can be detected** that might otherwise have gone unnoticed.



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2. Understanding crashes with collision reconstruction.

According to the [Noba Project](#), an online educational resource, “Hundreds of subsequent [psychological] studies have demonstrated that memory can be contaminated by erroneous information that people are exposed to after they witness an event.”¹

The faulty eyewitness phenomenon becomes a significant problem if one of your school bus drivers is involved in an accident. When that happens, eyewitness accounts likely come from the bus driver, the other driver involved in the accident, or the young student passengers. **To protect drivers and the institutions they work for from human error, administrators need a solution that provides objective evidence when an accident occurs.**

Geotab enables collision reconstruction for accurate incident testimony.

Geotab records vehicle position data and video so school administrators and investigators don’t have to rely on eyewitness accounts. These data points give Geotab the ability to reconstruct the accident for an accurate, data-driven record of the events that occurred before, during, and after a collision.

With collision reconstruction, you’ll know the cause of the crash and who was at fault, helping your district save costs associated with false claims, increased insurance premiums, and litigation—not to mention damage to the district’s reputation. Collision reconstruction also allows you to educate the operator about what went wrong, coach them on how to avoid similar situations in the future, and gain a broader understanding of the event by looking at that specific driver’s historical driving patterns.

Key collision reconstruction telematics features:

- **Data recording.** Some solutions transmit vehicle data only every 15 to 30 seconds and can miss critical moments of a collision. Curve-based logic can provide data about what happens before, during, and after an accident.

¹Noba Project, Eyewitness Testimony and Memory Biases, 2024



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3. Keeping track of students.

At the start of the 2024 school year, an eight-year-old boy in Nampa, Idaho, accidentally got on the wrong bus. Luckily, he managed to find his way safely home, but his dad described the scramble to locate his son as “the longest two hours of our life.”¹

Stories like this happen all too often, especially at the start of a new school year. Young students don’t always remember where they’re supposed to be, causing the responsibility to fall on bus drivers. With more than 30 students to pick up and drop off each day, it is difficult for bus drivers to operate their routes and keep track of students. **To help prevent missing students and ensure that safety remains a priority, fleet administrators need a solution that makes it easy for bus drivers to track student attendance while performing their other duties.**

T-Mobile and Geotab have partnered with student transportation industry leaders for routing and ridership capabilities.

As an open telematics platform, Geotab can sync with leading student ridership services. This makes it easy for bus drivers to automatically see who is or isn’t on the bus—enabling drivers and administrators to help confused students find the correct bus before they even leave school grounds.

A tablet-based student ridership system can be used to track when each student gets on and off the bus. The system transmits this data to the administrator’s student identification server where drivers can see whether all students have boarded or exited. In addition, districts can run reports capturing activity for each student.

With this data, fleet administrators can ensure students aren’t lost or left behind. This information can also be compiled into handy reports that show timestamps of when and where students board or disembark the bus, making it easy for parents to view their child’s activity.

Key student tracking telematics features:

- **Open platform.** Allows for seamless integration with your student identification provider.

¹KTVB7, Nampa parent recounts ‘traumatic’ experience after their child takes wrong bus, August 2024



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4. **Verify thorough vehicle inspections with digital vehicle inspection reports.**

Reputable bus driving operations are committed to performing pre- and post-route inspections on their vehicle. Although inspection requirements vary by state and company, it's not uncommon for inspection documents to have up to 10 pages of instruction—some even longer.¹

That means bus drivers complete pages worth of inspection paperwork each day—twice a day, five days a week. **Without the right solution, bus drivers and fleet administrators waste valuable time sorting and tracking inspection paperwork.**

Geotab provides digital vehicle inspection reports (DVIRs) that save your organization time and resources.

Geotab's DVIRs digitize paper-based operations, reducing the time and resources required to document the inspection process. By simply checking inspection items off of a digital list on a tablet or mobile device, important inspection information is organized, sent to administrators, and stored in an electronic record—with no paper filing required.

In addition to making it easier for drivers to complete inspections and administrators to organize files, Geotab DVIRs help ensure drivers are completing their inspections properly. Because the telematics platform houses all DVIR data, supervisors can confirm the work has been completed by comparing an individual inspection duration to a set standard duration.



Key DVIR telematics features:

- **Completion times.** Ensure a thorough inspection by tracking the amount of time a driver spends completing the DVIR.
- **Platform integrations.** DVIR's are integrated within the telematics platform, so any issues automatically send an alert to the fleet management information system (FMIS) or other integrated platforms for quick remediation.

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CHAPTER TWO

Streamlined school bus maintenance.

Truancy and chronic absenteeism result in severe consequences for students. One report issued by the [White House](#) notes that consistent school absences negatively affect students' grades, hurt their performance on standardized test scores, and can even be a predictor for a student's chances of dropping out of school in the future.¹

Your bus fleet is responsible for getting every student to school on time. Unfortunately, even valid excuses such as mechanical failures cannot compensate for lost student learning. **To transport students safely and on time, fleet administrators and mechanics must prevent school buses from breaking down or wearing out on the job.**

Geotab notifies fleet mechanics with predictive maintenance reporting.

Rather than waiting for a vehicle to fail when it's needed most, Geotab provides proactive mechanical alerts to eliminate breakdowns before they occur. These early alerts allow mechanics to schedule maintenance at the right times and avoid service disruptions.

Geotab uses vehicle data to determine when preventive maintenance or repairs are needed, issuing alerts before the service. As original equipment manufacturers (OEMs) phase out production of new diesel-powered school buses, school districts must stretch their current engines' work lives even longer. Predictive maintenance can even identify trends by engine type so mechanics can anticipate engine failures and schedule a rebuild to keep things running smoothly longer.



Key predictive maintenance telematics features:

- **FMIS and OEM integrations.** Seamless integration with your FMIS to use OEM maintenance recommendations to fine-tune service intervals.
- **Asset utilization reports.** Help your fleet last longer by ensuring all your school buses are used equally.
- **Predictive maintenance algorithms.** Data-backed tracking that predicts potential vehicle failures and alerts beforehand.

¹The White House, Chronic Absenteeism and Disrupted Learning Require an All-Hands-on-Deck Approach, September 2023

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CHAPTER THREE

Sustainability and clean fuel conversions.

Without the hard work of our nation's school bus drivers, the roads would be busier and the skies dirtier. On average, a single school bus replaces 36 individual vehicles driven by parents taking their children to school. Over a year, 36 fewer vehicles on the road each day translates to fuel savings of 4,800 gallons per bus.¹

And with today's improvements, fleets can become greener. Engines can be replaced with fuel-efficient technologies, routes can be redrawn to save fuel, and drivers can follow eco-friendly driving habits. **To improve your fleet's sustainability, your administrators need a solution that helps track efficiencies at every turn.**

Geotab helps bus drivers track and reduce emissions.

Geotab can track the movement and operating conditions of your school bus fleets, identifying wasteful driver habits and inefficient routes that hurt your fleet's eco-friendly goals.

With this information in hand, fleet administrators can coach drivers to avoid fuel-wasting behaviors and keep buses maintained and running efficiently. With these data points, Geotab helps your buses run greener, while saving on operating costs with improved fuel economy.



Key sustainability telematics features:

Emissions dashboard. Helps manage CO₂ emissions, making it easy to:

- Find opportunities for improvement.
- Evaluate fuel economy by benchmarking against similar fleets.
- Study driving behavior trends to promote fuel-efficient driving.
- Measure progress toward your fleet's CO₂ emission reduction goals.

¹New York School Bus Contractors Association, School Bus Fast Facts . . . spread the news! 2024

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Clean fuel conversions—electrification.

As on June 2024, there are more than 12,000 electric school buses (ESBs) on U.S. roadways.¹ Following reports from the [Environmental Protection Agency](#) (EPA) that ESBs help reduce harmful diesel emissions, lower maintenance costs, and improve student achievement,² the ESB adoption is anticipated to increase.

Whether your organization is considering implementing ESBs or already using them, Geotab can help get you ready.

Before electrification—Geotab helps determine feasibility.

You won't need to fund an expensive engineering study to determine ESB feasibility. Geotab data from your existing diesel fleet can provide the information you need to plan for electrification by helping determine which routes are suitable for electric vehicles, as well as assessing your future power needs. This information alone can save your district hundreds of thousands of dollars that would otherwise be spent on a feasibility study.

During electrification—Geotab helps enhance compliance.

Once ESBs are on the road, Geotab tracks energy consumption, state of charge, and range by bus, across the fleet. This information makes it easy to demonstrate compliance with local, state, and federal grant requirements, especially as they become more stringent.

After electrification—Geotab helps collect ESB data.

Geotab makes it easy to monitor the state of an electric vehicle's charge, when or if it's charging, and where it's charging. This information makes it easy for fleet administrators to assess their charging strategy and rotate power as needed. Your fleet's buses won't end up stranded due to low battery power, and you can rest assured your students will get to and from school without service disruptions.

¹World Resources Institute, The State of Electric School Bus Adoption in the US, July 2024.

²United States Environmental Protection Agency, Benefits of Clean School Buses, July 2024



Key electrification telematics features:

- **Expert guidance.** Reports on overall usage, energy consumption, charging behavior, and reliability provide straightforward grant compliance management.
- **Cost and CO₂ reduction forecasts.** Identify cost savings and CO₂ reductions related to electrification.
- **Charging status updates.** Be alerted when electric school buses aren't charging as planned and when ESB charging cycles are complete.

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CHAPTER FOUR

Are you looking to improve the way you manage your fleet? Here's how to get started.



If you're considering implementing Geotab fleet management solutions for your school bus fleet, it's easy to begin. The following steps will take you from the decision-making process all the way to installation and management.

1. **Consider your fleet's needs.**

If the following problems describe your current telematics solution, it might be time to switch to Geotab:

- Platform is not open or customizable.
- Platform is not scalable.
- Platform is not affordable.
- Platform does not offer the statistics, monitoring, and other features you care about most.
- You don't already have a telematics solution.

2. **Contact a T-Mobile for Education solution expert.**

Your solution expert will be your main point of contact and will have the knowledge and technical expertise to align each component of your solution with your individual needs and goals.

3. **Complete a DIY installation or request professional setup.**

Geotab is easy enough to install yourself. But you can also speak to your T-Mobile for Education solution expert about professional installation services.

4. **Ask questions and troubleshoot as needed.**

All Geotab solutions include free, one-on-one customer support. If you have any questions or issues, we're here to help.



About us.

With Geotab's cutting-edge technology and the reliability of the T-Mobile nationwide network, we deliver the data and connectivity you need to improve efficiency, increase safety, and reduce costs. Trust us to provide the comprehensive solutions your fleet needs to succeed.

T-Mobile for Education

T-Mobile for Education has the innovative tools, real-world experience, and long-term vision K-12 educators and administrators need to power learning virtually anywhere for their students. Education is no longer confined to the four walls of a classroom—that's why you need a partner in connectivity. We are dedicated to ensuring greater access, equity, and innovative ways of learning for everyone, both on and off campus—all on our powerful network.

Geotab

Geotab is advancing security, connecting commercial vehicles to the internet, and providing web-based analytics to help customers better manage their fleets.

Geotab's open platform and Marketplace allows small and large businesses alike to automate operations by integrating vehicle data with their other data assets. Geotab leverages data analytics and machine learning to help customers improve productivity, optimize fleets through the reduction of fuel consumption, enhance driver safety, and achieve strong compliance to regulatory changes.

Learn more by visiting [T-Mobile Fleet Management](#).

This eBook is intended to provide information and encourage discussion on topics of interest to the telematics community. Geotab is not providing technical, professional, or legal advice through this whitepaper. While every effort has been made to ensure that the information in this whitepaper is timely and accurate, errors and omissions may occur, and the information presented here may become out of date with the passage of time.

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