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# Complete Guide to School Bus WiFi

## Overview

To bridge the digital divide and make it easier for children without Internet access at home to keep up with their peers and enjoy better access to learning material and other resources outside school, many school districts have outfitted school buses with WiFi connectivity.

Here we talk about the benefits of this solution, how it has helped students, teachers, and districts, and how you can roll out a school bus connectivity program of your own.

### Key Points Addressed

1. Benefits of School Bus Wifi
2. How does it help students, teachers, and districts?
3. How can you roll out your own school bus connectivity program?

Internet access at home has a significant impact on the ability of K-12 students to learn at home, complete assignments, and understand course content.

Various studies have found that students with regular, unobstructed Internet access perform better than students without, and these same studies have found that an estimated nine million children lack Internet connectivity of any kind at home. Amongst those who do have some level of connectivity, there are additional issues and obstacles to learning that many children face, from data caps and poor connectivity to cost issues, poor supervision, distraction, and limited tech literacy – amongst students and parents alike.

School bus WiFi one way in which schools and districts can support students – especially those with limited Internet access at home – to help them make the most of remote and hybrid learning and grow into confident digital citizens.

## Understanding the Problem

ACCORDING TO PEW RESEARCH:



# 9 Million

Estimated number of children lacking any kind of internet connectivity at home.

## 60%

Of eighth-graders rely on the Internet at home to complete homework assignments.

## 65%

Of suburban school students use the Internet for homework every day or almost every day.

## 1/7

U.S. homes with school-going children do not have high-speed Internet at home.



**58%** for children who attend city schools.



**50%** of children who attend rural schools.



**44%** for children who attend schools in towns.

These figures show the importance of connectivity and the ways in which **geography** and **location** affect connectivity rates.

RESEARCH HAS ALSO SHOWN THAT:

**American Indian and Native Alaskan** children have lower levels of access than almost every other demographic.

6/10

of these children have Internet access at home.

The homework gap is more pronounced for **Black, Latinx,** and **lower-income** households.

1/3+

of households with incomes of less than

\$30K

lack internet access.

*compared to*

6%

of households with incomes of

\$75K

or more, lack internet access.

~10%

of teens resort to using public WiFi for schoolwork.

25%

of low income teens lack access at home.

4%

of teens from middle- to high-income families.

~1/7

**lower-income teens** say they do not have the resources they need to complete schoolwork at home.

25%

Black Teens

13%

White Teens

17%

Hispanic Teens

These statistics show the relationships between **income, race, and education (having a parent with a college degree)** with connectivity at home, and the fact that the digital gap and student attainment are issues with racial, social, economic, and geographic dimensions.

#### WITHIN THIS CONTEXT, CONSIDER THE FOLLOWING:



About **25 million students** ride the bus to school every day.



Buses provide an estimated **10 billion** student rides every year.



Average ride times vary widely by geographic location. Some commutes clock in at 90 minutes each way, with others only lasting 5-7 minutes.



Rural riders have longer commute times than city and suburban riders.

The takeaway from these figures – and the opportunity at hand – are clear. Too many students lack the connectivity they need to perform well at school, but they spend enough time commuting to and from school for us to meaningfully help them catch up where they may be falling behind.

We can even deliver after-hours connectivity at student homes by parking WiFi-equipped buses at strategic locations throughout disconnected communities to create community WiFi hotspots. We have seen many districts use this [creative application](#) to support their students during COVID-19 school closures.

Let's discuss the benefits of these initiatives, how they work, how to roll out a plan, and common pitfalls to avoid in the following sections.



## Benefits of Bus Connectivity

Here are a few ways in which students, teachers, and district leaders can enjoy quick wins with a connected bus solution.



Extend learning time by providing students with access to learning material, classes, educational apps and websites, and other resources needed for assignments and projects while they commute to and from school.



Monitor student progress and how they use the material available to them to improve course design and quickly identify learning issues.



Improve discipline: Many school districts have reported a [fall in disciplinary complaints](#) on buses with WiFi connectivity.



Gathering real-time location can help improve route planning and can be used to update parents about bus arrival/departure at home/school, or while at athletic events or on field trips.



Provide schools with comprehensive Internet data usage and reports that can guide future decision-making.



Many districts with on-board WiFi have reported that connectivity on the bus has [helped many students finish homework](#) when they used to struggle to do so.



Being able to work or study on the bus can help students stay on top of their schoolwork despite being overbooked with extracurriculars and other activities.



Some providers of school bus WiFi (including Kajeet,) you can share data across different students or buses based on need.



Enjoy lower plan costs per student compared to across-the-board at-home connectivity.



Ensure that students only use the Internet via CIPA-compliant filters and secure firewalls.

There are many success stories of school bus WiFi that illustrate how a connectivity solution can transform communities. For example, a project in Farmington, NM helped students with commutes as long as 90 minutes each way to and from school rack up to 900 hours of learning using buses fitted with WiFi connectivity, and another project in Beekmantown, situated in rural upstate New York, helped connect almost 2,000 students in the wake of the COVID-19 pandemic.

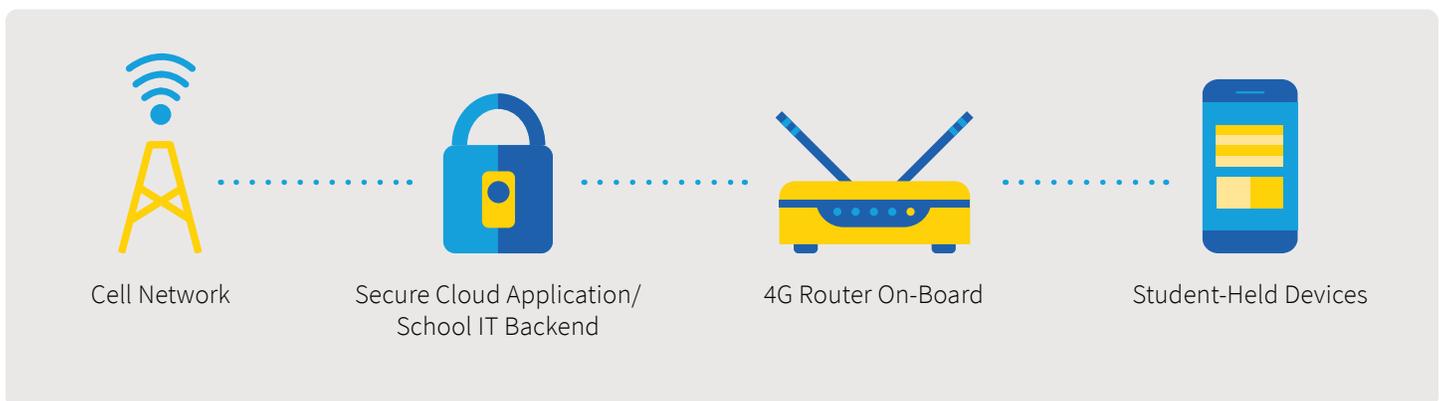
Other projects in [Austin, TX](#), [Cañon City, CO](#), and the [Merced Union High School District](#) in the San Joaquin Valley in California helped connect at-risk students, set up community hotspots after school hours, improve student achievement, and make the most of commute times with connectivity and data-driven decisions that improved attendance, discipline, and achievement.

# 900 hrs

of learning racked up by using buses fitted with WiFi connectivity for a project in [Farmington, NM](#).

## Equipping Buses with WiFi

At the most basic level, bus WiFi infrastructure delivers connectivity as follows:



These systems can be combined with video, telematics, AI, and machine learning applications to enhance the overall ROI of your system and ensure that students can – and are – accessing the material they need to learn.

### A ROBUST SCHOOL BUS WIFI SOLUTION WILL INCLUDE:

- Mobile and cellular data communications technologies such as 3G, 4G, LTE, and WiFi connectivity that are handled at the router level.
- Cloud management applications/user dashboards and integration with the school IT backend.
- Secure gateway devices with customizable levels of authentication, authorization, and encryption that ensure student safety.
- Hard and portable WiFi units for flexible installation and easy use.
- Rugged devices that can withstand harsh environmental changes and the vibrations and movement that come with bus travel. These devices typically have various IP-ratings (spill and shock-proof) and comply with vibration and environmental stress standards.
- Carrier diversity via installed SIMs for reliable connectivity.
- GPS for tracking and location-based statistics and reporting.

## Rolling Out a Plan

While there is no silver bullet to the Internet connectivity issue facing schools and students in America today, district leaders can make significant headway in addressing access and learning gaps through a thoughtfully crafted bus connectivity plan.

Here are important area to consider as you roll out your school bus WiFi initiative:

### ESTABLISHING THE 'WHY'

Identify the most critical gaps you need to address and show how WiFi bus connectivity can address those issues. This includes an assessment of when, where, and how bus WiFi will help during student commutes and how bus hotspots can be used in the community to provide Internet access to disconnected children at home.

### GET THE RIGHT STAKEHOLDERS AND APPROVALS IN PLACE

These include superintendents, members of the school board, the transportation director, and the chief financial officer. You will also need to think about evening drivers, parking permissions, and where students live with respect to potential hotspot sites.

### SCHOOLS, IT DEPARTMENTS, & TRANSPORTATION SERVICE PROVIDERS MUST WORK TOGETHER

Before you can equip your buses with Internet connectivity devices, you must determine whether you have the access – and permission – needed to do so. You also need to work out when and where there may be connectivity drops, such as when a given bus may travel across an area with no reception. Drivers and others (such as school IT staff) may also require training on using physical devices or cloud applications that will integrate with existing IT systems at your school or district.

### CIPA-COMPLIANCE AND OTHER FILTERS

You need to put the right filters and security checks in place before you can allow children to access content while on the bus.

### UNDERSTANDING DEVICES AND STUDENT USAGE:

What kinds of devices will students use? School-provided devices only, home devices only, or both? Device access and equity issues can arise here. In addition, how will credentialing and access be addressed, and what sites need to be accessible? Will you cap usage? What services are best suited to your needs?



~2,000

students connected in the wake of the COVID-19 pandemic for a project in Beekmantown of upstate New York.

### OBTAIN FUNDING

Your school bus WiFi vendor can help you determine what kind of connectivity plan is best for you based on your projected data and access needs. Check out the [Kajeet Education Funding Guide](#) to learn more about funding opportunities that could support your school bus WiFi program.

### RUN A PILOT

Roll out the program on a small scale first to identify any gaps or pinpoint bottlenecks that you need to be aware of before going for a school- or district-wide launch.

## Important Challenges

During the pre-launch and planning stage of your bus WiFi initiative, you will likely uncover issues at the school, student, and district levels that this solution will help you address.

### HOWEVER, SOME COMMON CHALLENGES MAY ARISE, INCLUDING THE FOLLOWING:



Connected user limitations: Some systems are designed to only connect up to a dozen or so simultaneous users. How many students will need access at the same time? There can be considerable cost jumps between services that provide connectivity to, say, 5-10 concurrent users and systems that connect 30+ users at the same time.



Power issues: How will the system be powered, and how long will hotspots last?



Can you ensure signal strength for all users? How far will WiFi hotspot signals travel, and can connectivity be ensured across students' routes?



Single-carrier, single-SIM systems can lead to issues, especially if your buses cross dead zones in remote areas or need to switch carriers along the route.



Overseeing and managing the performance of your program is vital, but can prove challenging. Fleet-wide software that provides you with a bird's-eye view of all buses and students is also an important part of getting bus WiFi right.

Learn more about how the [Kajeet SmartBus™](#) solution addresses many of these concerns.

## Additional Considerations and Opportunities

In addition to the homework and study benefits of onboard WiFi, there are many other ways that bus connectivity can be leveraged by your students, bus drivers, and district.

### CONSIDER THE FOLLOWING:



Global Positioning System (GPS) data can be used to improve and streamline bus routing, and to track real-time bus movements.



Driver tablets can improve driver accountability, safety, and efficiency.



Telematics can help automate tasks, predict maintenance needs, and ultimately lower the total cost of ownership. Telematics can be used to track everything from hard braking and fuel consumption to sound levels on the bus and engine diagnostics.



Cameras may promote driver and student accountability and compliance with applicable driving and safety laws.



Student ID cards can be issued to enhance security and safety. Student cards may even be fitted with RFID technology to track when and where a student boards or disembarks the bus. Parents and school administrators can track if students were on the right bus and if they got off at the right stop.



Smart sensors and systems can be used to track general purpose input/output events, such as when the stop-arm is operated, if doors are open, if a child is left on the bus, and if the top hatch or windows are open.

## Final Thoughts

Every student, school, and district faces unique learning challenges and resource limitations, but solutions such as onboard bus WiFi can be used to address some of the most pressing challenges that educators face when it comes to enhancing equity, improving connectivity, and driving better student outcomes. While project plans and pilot implementations will vary from school to school and from district to district, many of the building blocks of successful onboard bus WiFi connectivity solutions can be assembled and deployed right out of the box.

### [Kajeet is the #1 provider of school bus WiFi in the U.S. and Canada.](#)

The Kajeet SmartBus™ solution is a one-source wireless solution allowing schools and districts to extend the classroom to the bus. SmartBus™ keeps your drivers happy, students connected and behaving, and buses running safely – and, it can be used to connect students in any mobile environment, such as athletic buses, activity vehicles, and maker buses.

#### **INTERESTED IN LEARNING MORE?**



Contact a [Kajeet Solutions Specialist](#) for a free consultation.  
202.482.3500 | [info@kajeet.com](mailto:info@kajeet.com)

#### **Resources (in addition to the sources that are linked):**

1. <https://www.kajeet.net/the-connected-bus-8-technologies-for-the-next-generation-school-bus/>
2. <https://www.atu.org/work/school>
3. <https://www.nysbca.com/fastfacts.html>
4. <https://www.pewresearch.org/fact-tank/2020/03/16/as-schools-close-due-to-the-coronavirus-some-u-s-students-face-a-digital-homework-gap/>
5. <https://www.kajeet.net/success-stories-farmington-schoolbus-wifi/>
6. <https://www.kajeet.net/beekmantown-central-school-district-student-connectivity-in-an-emergency/>
7. <https://www.kajeet.net/austin-isd-school-bus-WiFi-for-distance-learning-and-beyond/>
8. <https://www.kajeet.net/canon-city-schools-creating-a-completely-connected-11-program/>
9. <https://www.kajeet.net/merced-union-high-school-district-dream-beyond-what-you-know/>