



CASE STUDY

The Reel Solution: Optimizing Spokane's EV Charging Infrastructure with Advanced Cable Management

Spokane Transit Authority, Washington, USA



Business Challenge

Across the globe, the familiar rumble and smell of city diesel buses is giving way to a quieter, cleaner revolution in public transportation – zero-emission electric buses. The 2024 Electric Vehicle Outlook predicts a swift acceleration of this trend, forecasting that electric municipal bus sales will surge past 60% by 2030 and reach an impressive 83% by 2040.

While Europe and China have led the charge in e-bus adoption over the past decade, with more than half their public bus fleets now electric, North America is rapidly emerging as a key growth market. Fueled by government initiatives, technological advancement, and growing public enthusiasm, major metropolitans from coast to coast are embracing e-buses to improve air quality, reduce noise pollution, and cut costs. Spokane, Washington, stands out as a prime example, boldly committing to a 100% zero-emissions bus fleet

by 2045. The Spokane Transit Authority (STA) has already made significant strides, launching City Line, the nation's first all-electric, five-door Bus Rapid Transit (BRT) system, and successfully electrifying a high-performance north-south transit corridor with 10 dedicated e-buses.

The long-term success of ambitious zero-emission initiatives like Spokane's hinges on building out robust commercial-scale EV charging infrastructure. However, deploying safe, effective Level 3 fast-charging solutions for public e-buses is not without challenges. Limited experience, rapidly evolving technology, and a stream of new market entrants can lead to operational hiccups, quality compromises, and increased expenses. Fortunately, as cities like Spokane navigate the complexities of EV infrastructure projects, experienced industry leaders are stepping in with solutions and support that ensure safe, reliable, and cost-effective charging.

The Cable Management Conundrum: Identifying Early Challenges with Reel Solutions

When STA embarked on building a new, fully enclosed garage for their e-buses, they designed a reliable infrastructure incorporating backup generators and ceiling-mounted Level 3 EV chargers delivering 150 kW of power. Level 3 EV chargers provide significantly more power, enabling much faster charging for e-buses that cover a greater range during their shifts and make frequent stops.

“While other cities utilize outdoor charging, Spokane’s harsher climate, characterized by snow, rain, and below-zero temperatures for much of the year, necessitated an enclosed garage. Colder climates demand higher charging rates, which increase costs and put more strain on the batteries”

Michael Ketterer
Technical Project Specialist for STA

“We opted for ceiling-mounted chargers to maximize flexibility and safety. Unlike pedestal chargers that restrict driving space, increase the risk of accidents, and require e-buses to park in specific charger-aligned spots, ceiling-mounted chargers with drop-down cables allow us to reach multiple buses safely and effectively throughout the garage, regardless of their parking location. This is crucial when managing 40 buses that all require charging during off-duty hours,” explains Michael Ketterer, technical project specialist for STA.

Supporting the higher power demands of Level 3 charging necessitates thicker and heavier cables that must be properly managed to optimize heat dissipation and prevent damage and safety hazards. Any cable left dangling or lying on the floor can become a safety risk and cause damage to vehicles, the cable, charging handles, or the charger itself. STA’s initial design included an EV cable reel solution to manage charging cables with hard-wired connections and cables running through the reel.

Unfortunately, this solution proved inadequate in terms of heat build-up and overall performance, leading to a warranty dilemma with the EV charger manufacturer.

“With the first reels we selected to manage the cables, our EV charger manufacturer would not provide a warranty for the entire charging system all the way to the charging handle that plugs into the vehicle. Any issues such as overheating within the cables and damage to the handles would not be covered, which presented a significant financial risk,” says Ketterer. “The reels also did not give us sufficient cable length to reach more than two buses from a single charger, and the technical support was lacking. We realized we needed a different solution.”



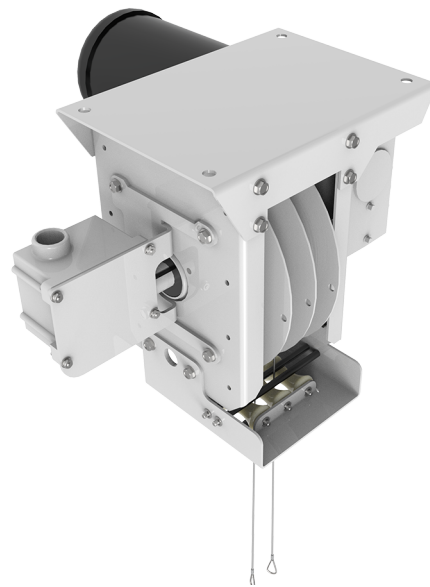
Ceiling-mounted cable reels from Gleason Reel offer flexibility and safety for electric vehicle bus charging for the Spokane Transit Authority.

Introducing a New Approach: STA's Collaboration with an Industry Leader

Around the same time that STA recognized the need to replace their initial EV charging cable reels for the new garage, Hubbell introduced its Gleason Reel Motorized Overhead Retractable Reel for commercial EV charging cables. Following a successful deployment of the Gleason solution in British Columbia, STA learned about the reel and began collaborating with Hubbell experts to implement the solution for their Level 3 charging stations in Spokane.

Hubbell's Gleason Reel Motorized Overhead Retractable Reel is specifically designed to support large ceiling- or wall-mounted high-current EV charging cables for indoor and covered outdoor locations, such as STA's new garage. Unlike other reels on the market that utilize traditional slip rings, the Gleason Reel employs a unique dual drum for variable rate wrapping and a limit switch to prevent over-retracting or over-extending. The reel attaches to the Level 3 charging cables using a specialized saddle clamp constructed from F1-rated Nylon 6, engineered to withstand high-use environments. The clamps minimize mechanical stress on the cable, maintaining proper bend radius and optimizing heat dissipation to prevent shorts and overheating that can degrade the cables and shorten their lifespan.

"Rather than hard wiring and wrapping the cable around the reel, our Gleason reel manages and stores the cable without interacting with the cable itself. This eliminates any risk of overheating or damage to the cable," explains Eric Witkowski, product manager for Hubbell.



“ The reel is motorized to accommodate high mounting heights and can support up to 100 pounds of cable, safely keeping it off the ground to prevent damage and safety hazards. ”

*Eric Witkowski
Product Manager for Hubbell*

Hubbell's Gleason Motorized Overhead Retractable Reel is controlled by a variable frequency drive (VFD) housed in a NEMA 3R-rated weatherproof enclosure and features a user-friendly control panel with a three-button pendant for effortless operation. The reel's design effectively solved the STA's warranty issues and provided additional operational and maintenance advantages.

"With the new Gleason Reels, our charger manufacturer now offers a comprehensive warranty on the entire charging systems, extending right to the handle that connects to the buses. The new reels also allow for extra cable length to reach up to four buses per charger instead of just two, and the cables lower smoothly without getting tangled," says Ketterer. "Our bus drivers simply drive in, and a member of our service crew just presses the button to lower the cable and plugs the handle into the vehicles."

The Value of Customer Support: Continued Collaboration for a Zero-Emissions Future

Beyond peace of mind of a complete system warranty and enhanced operational flexibility, STA also values Hubbell's superior customer support and technical service. For instance, due to cable length and the garage's high ceilings, STA was concerned about the charging handles potentially hitting the ground during operation. Based on STA's feedback, Hubbell designed custom travel loop heads for the saddle clamps, which mount on either side of the charging head. This innovative solution keeps the cables properly looped and prevents the charging heads from ever touching the ground while still providing the necessary extra cable length for STA to charge more e-buses.



"We've received excellent service and support from Hubbell, and they've been extremely helpful in ensuring we have the right solution for our facility," says Ketterer. "As Spokane continues to work towards a 100% zero-emissions bus fleet by 2045, we will continue to utilize the Gleason Reels wherever we install ceiling-mounted EV chargers. It's undoubtedly the best solution we've found."

With the garage now fully operational, utilizing EV chargers supported by Hubbell's Gleason Reel Motorized Overhead Retractable Reel for commercial EV charging cables, STA e-buses can easily pull in for fast, safe, and convenient overnight charging, ensuring they are ready for their routes first thing in the morning. The flexibility offered by the Gleason Reel also allows off-duty buses that service Spokane's morning and afternoon peak-hour tripper routes to park anywhere in the garage for daily charging.

While Spokane has made significant strides towards a zero-emissions fleet, the journey continues as the city works towards a cleaner, greener future. Expected to launch in 2030, the city's Division Street BRT project will connect downtown Spokane to Mead with rapid, zero-emission bus service using new 60-foot e-buses. They are also exploring the potential of incorporating hydrogen fuel cell buses alongside their existing battery-electric fleet. As these projects come to fruition, the city plans to expand its charging infrastructure and maintenance facilities to support its growing zero-emission bus fleet. Thankfully, with Hubbell's Gleason Reel Motorized Overhead Retractable Reels, Spokane has a reliable solution backed by exceptional support to effectively and safely manage EV charging cables, ensuring their e-buses remain operational and avoiding costly cable and charging handle replacements, ultimately delivering a healthy return on investment.

Gleason Reel continues to support Spokane Transit Authority in its ambitious journey toward achieving a zero-emissions bus fleet.



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