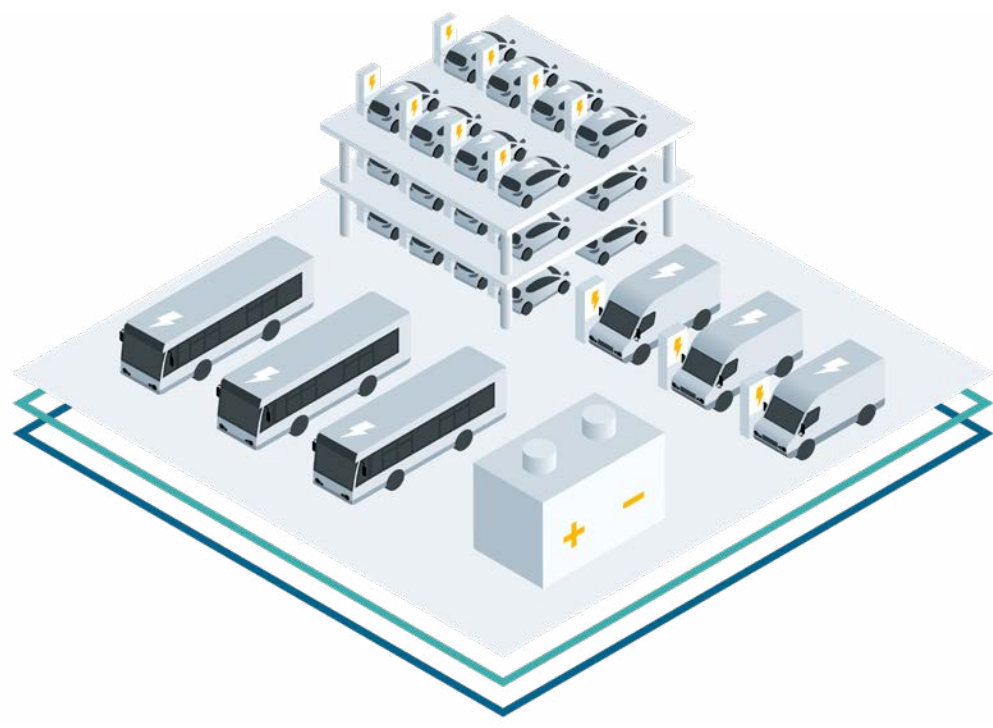


Getting Electric Vehicle Charging off the Ground at Scale



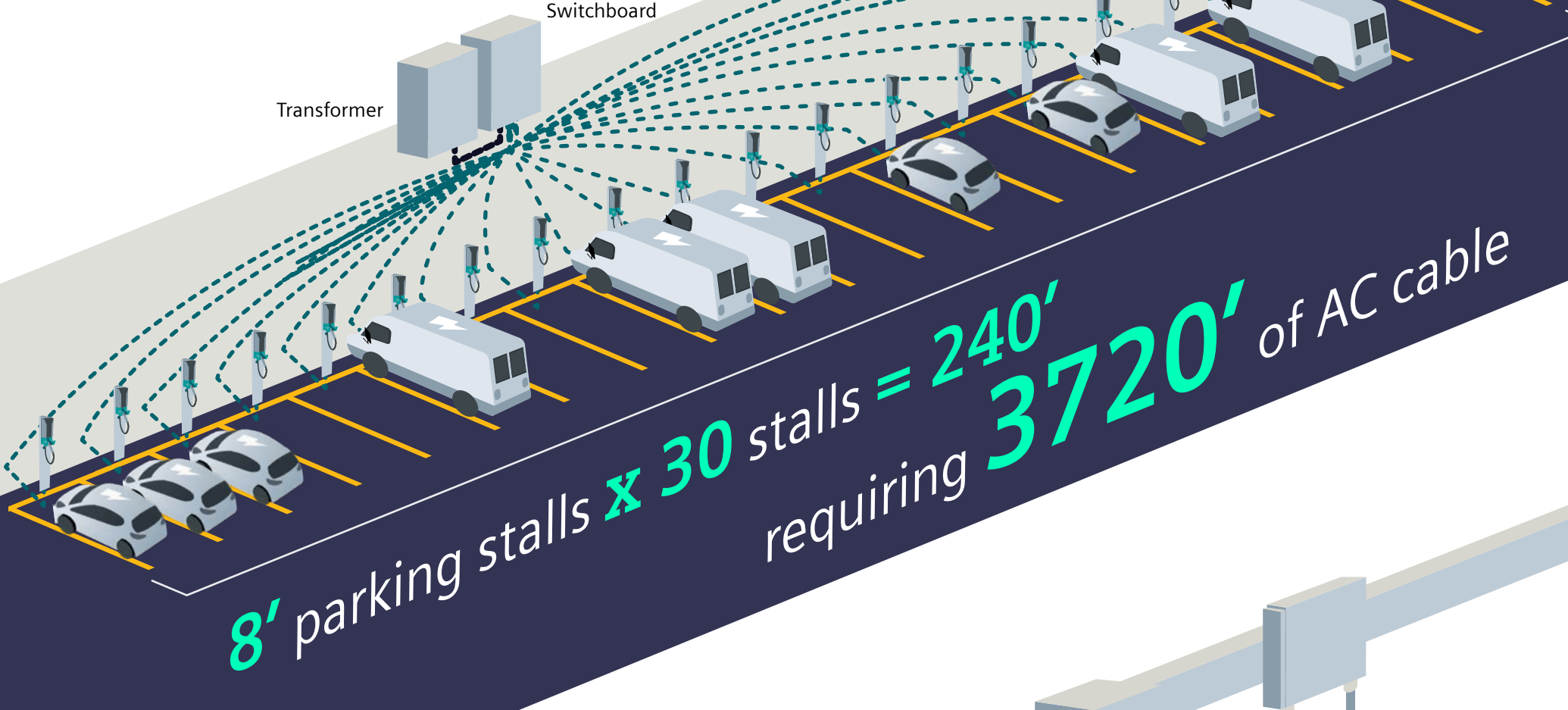
As electric vehicle penetration into fleet operations increase, electric vehicle (EV) infrastructure requirements will quickly grow from one-off pilots to full scale, multi-hundred or even multi-thousand charging points in a single location.

Cable/conduit-fed chargers are ideally suited for green-field smaller projects that do not require substantial future proofing. For large scale projects, however, Busway-fed charging is more cost effective. It allows for simpler site configuration by allowing chargers to be "out of the way" while enabling easier maintenance and future upgrades without substantial civil works.

Busway technology is very mature and with a few modest tweaks it is a perfect fit for large, cost-effective, electric fleet sites that are future proof.

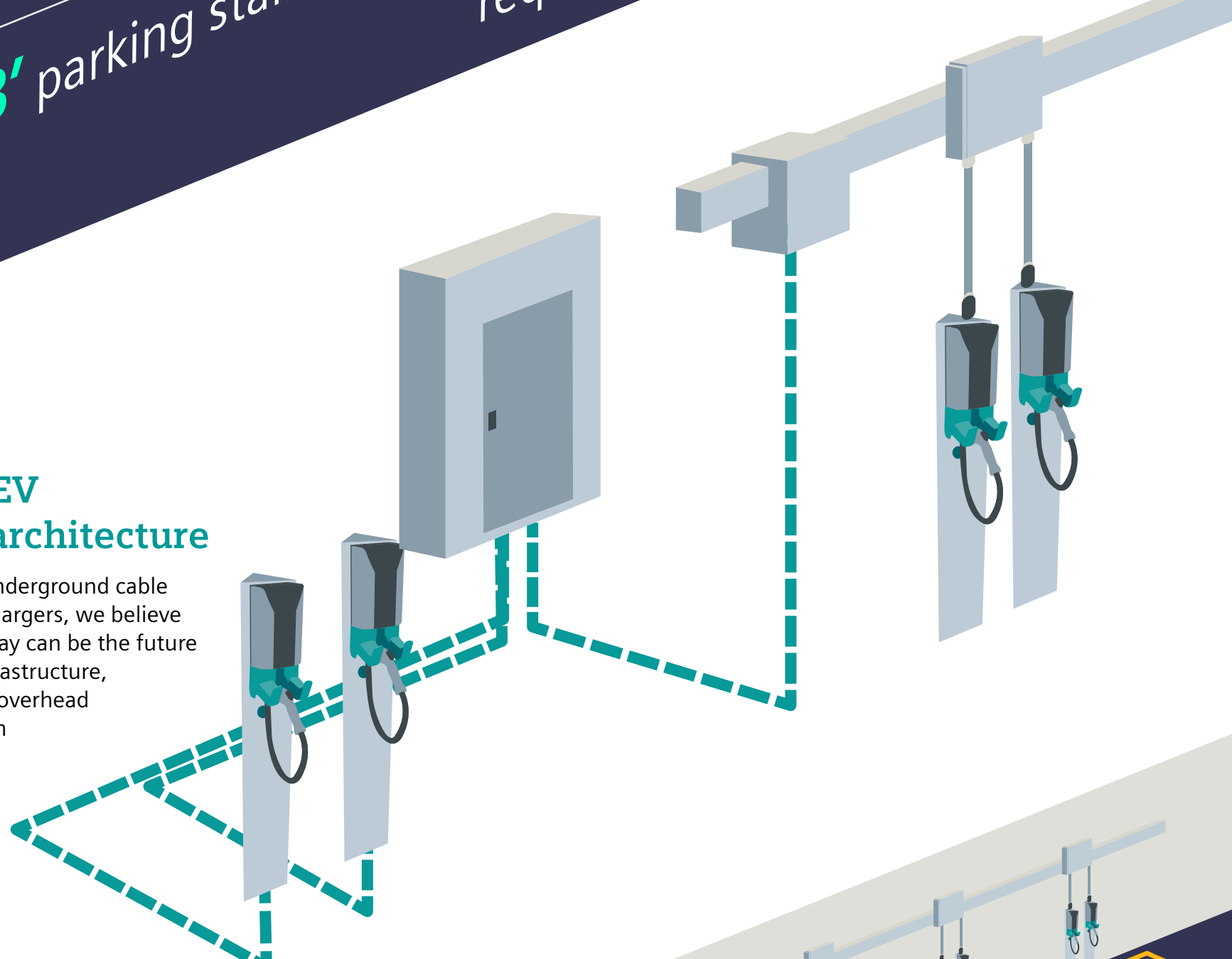
Today's level two charging architecture

- Alternating current (AC) chargers utilize individual power feed from low-voltage (LV) power distribution equipment, requiring homerun cable runs underground to each charging location from the distribution equipment.
- The power distribution is typically managed through switchboard power distribution with individual circuit breaker protection per charger.
- All cabling is routed through trenches and buried underground for space savings, but inaccessible for maintenance and any upgrades or additional charging stations.
- There are cables feeding chargers at the ground level at each parking stall.



Future of EV charging architecture

As oppose to an underground cable network to feed chargers, we believe that Sentron busway can be the future of EV charging infrastructure, taking the system overhead through a common power distribution network.



Cable conduit vs. busway cost comparison and savings

30 Parking Stalls	Busway*	Cable/Conduit	Δ
Materials	\$90k	\$80k	+\$10k
Installation	\$24k	\$60k	-\$36k
Total	\$114k	\$140k	-\$26k

Busway for EV charging

Sentron busway can be characterized by three key terms: Flexibility, modularity, compact. It consists of modular fittings that are composed of copper/aluminum conductors enclosed in an aluminum housing. These fittings are assembled to flexibly meet power distribution requirement through routings and power tap offs along the way. Through the consolidation of conductors into one package and the ability to tap off power at multiple points, busway offers a compact solution compared to its cable alternatives.

- Currently, level two charging has the more immediate need for busway systems. With the quantities of cabling required in a level two AC architecture, the application of busway has strong case to replace the cable installations through material and installation savings.
- Sentron busway is a proven indoor solution power tap off solution, being served to the market for over 25 years. Additional consideration is under investigation for expanding this platform to the scale of outdoor EV charging.

Technical advantages



Power distribution network moved from underground to overhead providing more accessibility for maintenance and adaptations



Consolidation of cable networks to single busway runs with multiple power tap-offs along to run for easier network tracing and lower complexity switchboards



Dynamic power specs for future changes in design (equipped for up to 600V)

Siemens EV Charging Infrastructure

Siemens is engineering how to leverage busway systems outdoors for EV charging infrastructure. Using busway systems will not only help customers to easily scale up their EV charging infrastructure, but it will also help reduce their installation and maintenance costs. To learn more about EV charging infrastructure solutions, please visit our eMobility page: www.usa.siemens.com/eMobility

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