



Electric Depot Site Planning and Construction

September 5, 2023



DEPOTS Electric Truck Bootcamp Series

1. **Best Practices for Utility-Fleet Relationships** (April 25th) ✓
2. **Grants and Incentives for the Trucks and Infrastructure** (May 16th) ✓
3. **Electric Truck Developments** (May 30th) ✓
4. **Faster Charging — Opportunities and Challenges at 350KW and higher** (June 13th) ✓
5. **Opportunities to Extend BEV Range** (June 27th) ✓
6. **Electricity Resiliency and Availability** (July 11th) ✓
7. **Current and Future Regulations for Zero Emission Trucks** (July 25th) ✓
8. **Managed Charging to Improve Availability, Cost and Range** (August 8th) ✓
9. **Scaling Charging Infrastructure Equipment** (August 22nd) ✓
10. **Electric Depot Site Planning and Construction** (September 5th)

2021 Bootcamp is still available at: <https://runonless.com/electric/bootcamp-electric/>

2023 DEPOT Fleets

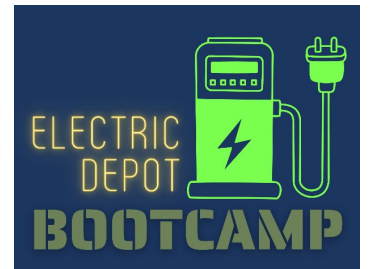
Update from The Run Planning...



Today's Bootcamp Sponsor



PROLOGIS®



Quiz for Today's Session

Completing Today's Quiz:

- Go to runonless.com and click back into the session
- Click 'Take Quiz' button
- Create username and password to keep track of your progress
- Spend a few minutes answering the questions and receive your 2023 RoLE - DEPOT badges



What You Should Know

Q&A

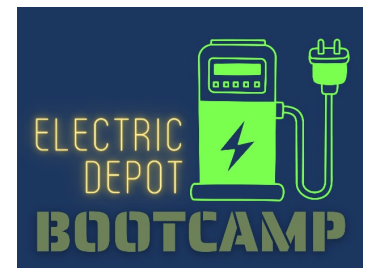
Submit your questions to the host using the Q&A box in the upper right-hand corner

Recording

A recording of today's webinar will be available on runonless.com

Technical Issues

Contact Stephane Babcock at stephane.babcock@gladstein.org



Today's Bootcamp Speakers

Electric Depot Site Planning and Construction



Gregory Brenner
*Principal and Managing
Director of National Client
Services*
WB Engineers+Consultants



Hannah Jacobus
*VP of Real Estate and
Development*
Voltera



Suresh Jayanthi
*E-Mobility Sales and Business
Development*
NextEra Energy Mobility



Van Wilkins
*Senior Vice President of
Operations*
InCharge Energy



Hosted by:
John Richardson
Electrification Consultant



A white semi-truck with a long trailer is driving on a coastal highway. The truck is viewed from an elevated angle, moving towards the right. The background features a steep, green cliffside overlooking the ocean under a bright, hazy sky.

NextEra Mobility – Role of Site Assessments in Efficient Infrastructure Deployment

Suresh Jayanthi, Senior Director Sales and Business Development

Run On Less, Session #10, Sept. 5 2023



NEXTERA
MOBILITYSM

NextEra Energy by the numbers

- World's largest generator of wind and solar energy
- America's 5th largest capital investor across all sectors
- \$215M+ committed to EV infrastructure development
- Ranked #1 Most Admired Energy Company (Fortune Magazine, 2023)



NYSE: NEE
Fortune 200 company



A- credit rating



\$145 B market cap*



\$21 B
operating revenue



\$159 B
total assets



~\$30 B
investment per year
through 2025

30 GW in operation
year-end 2022

40 GW in development
pipeline to 2026



22 GW Wind



5 GW Solar



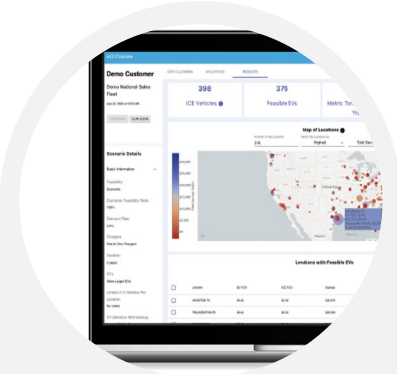
1000+ EVSE Installs



650 MW Behind the meter



What we offer

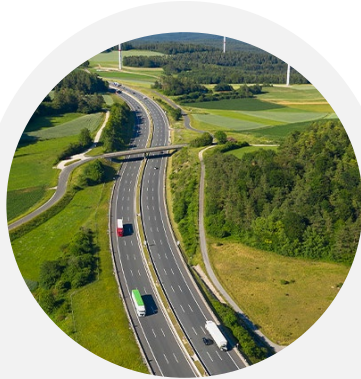


EQ Advisory

Fleet EV Advisory
Leader

Leader in North America with over 350,000 vehicles assessed for Fortune 500, public, and federal fleets

Fleet electrification modeling, change management, and site energy design



En-route

Highway Charging
Network

\$650 million joint venture with Daimler Truck North America and BlackRock

Long-haul charging infrastructure for medium- and heavy-duty trucks



Customer Depot

Charging as-a
Service

Customized turn-key charging infrastructure for fleet depots

Includes chargers, charge management and long-term O&M. Predictable payments and reduced upfront costs.



Off-site

E-Port Multi-User
Charging

Shared turn-key fleet charging hubs in major US cities

Access EV charging without having to commit to infrastructure development

Three Steps for Efficient Site Assessments

Driving Infrastructure Development to Optimize Total Cost of Operations (TCO)

1

Duty Cycle Analysis

Select appropriate EV models for your daily operational duty cycles and determine what charging infrastructure will be required to support them

2

Work Flow Analysis

Consider site attributes like existing fleet operations, utility service for electricity, vehicle-to-charger ratio, parking, and other factors

3

Stakeholder Engagement

Gather input from site-specific stakeholders who can provide valuable detail for relevant operational considerations

Step 1: EV Fleet Duty Cycle Analysis

Determine the charging needs for the EVs running your routes

Electric Vehicles

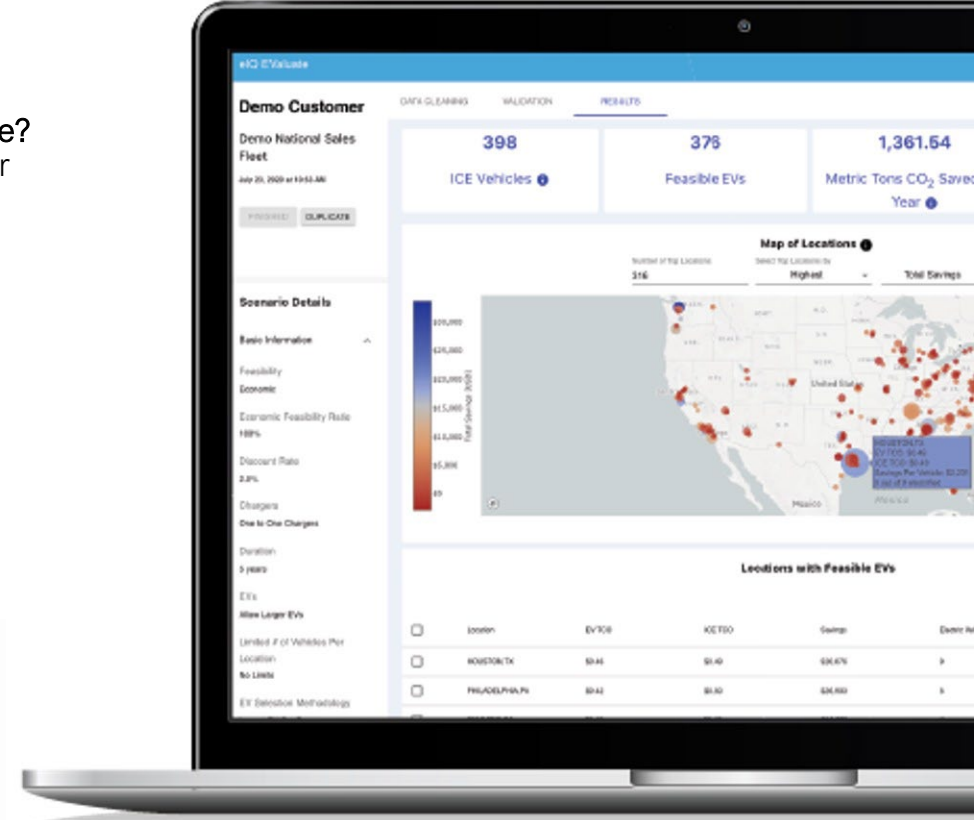
What are the recommended types of vehicles selected for this site?
Identify the exact EV makes and models that meet the fleet's operational & cost requirements.

The EVSE Equipment

What is the kW rating of the recommended equipment for the vehicles and this site?

Charging Infrastructure

How many chargers have been determined for this site?
Define EV chargers, short to long-term energy load for each fleet facility, site design & utility upgrades.



Step 2: Work Flow Analysis

Define EV chargers, energy load, site design & utility upgrades

Questions to Consider:

- Are there any available site drawings, mapping, blueprints, and utility billing for future engineering guidance we can request?
- Ensure that the infrastructure does not negatively impact existing operations
- Where is the existing parking area – inside or outside? Will this remain the same for the EVs?
- Can we get the recommended quantity of vehicles into the site to charge?
- Is there enough parking space today and for expansion/future proofing?
- Can we fit the required charging equipment or do we need to reconfigure the parking space to accommodate?
- What is the vehicle to charger ratio?
- Are there any planned construction upgrades over the next two years, solar or backup power, building expansions effecting parking configurations?
- Where are the utilities serving the site? Consider electricity, natural gas, and resiliency
- Is there a need to plan for ad hoc or temporary charging to overcome infrastructure readiness gaps?



Step 3: Stakeholder Engagement

Have the necessary representatives on-site to give input

- All Stakeholders have a key role. Are the right stakeholders/personnel invited to the site evaluation?
- Consider facilities manager, site operations manager, fleet operations manager, safety coordinator, electrician, qualified site evaluator, and utility representative
- Confirm site operations, such as:
 - Hours of operation
 - Shift duty cycles
 - 1-2 hour shifts
 - 3-8 hour shifts
 - no shifts - straight 24-hour operations with on-hour rotations
 - Are there any required night personnel needed to move vehicles?
 - Yard support



In summary: well-planned site assessments lead to asset optimization driving down the TCO

SITE ASSESSMENT TOP 3 ITEMS:

- Have a fleet-specific plan
- Have specific site information gathered
- Include the right stakeholders at the site assessment



Thank you!



Suresh Jayanthi *Sr. Director Sales & BD, NextEra Mobility*

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Your partner for the road ahead

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Information Utility Needs to Plan Your Project

September 5, 2023

The Only EV Infrastructure Partner You Need

Voltera sites, builds, owns, and operates strategically located, fit-for-purpose charging facilities – [enabling companies to deploy and operate EVs at scale.](#)



Powered, Proximate, Permitted Sites

Our approach shortens the deployment cycle and speeds your time to market.



Infrastructure to Enable Your Fleet

We offer a turnkey solution, from site acquisition to ongoing operations, supporting any scale of fleet deployment.



Unparalleled Customer Experience

We are focused on operating the most reliable sites in the industry, providing maximum uptime and power delivery.

Enabling EVs Across the Transportation Industry



Rideshare & Taxis



Drayage



Delivery & Distribution



Hydrogen Fueling



Car Rental

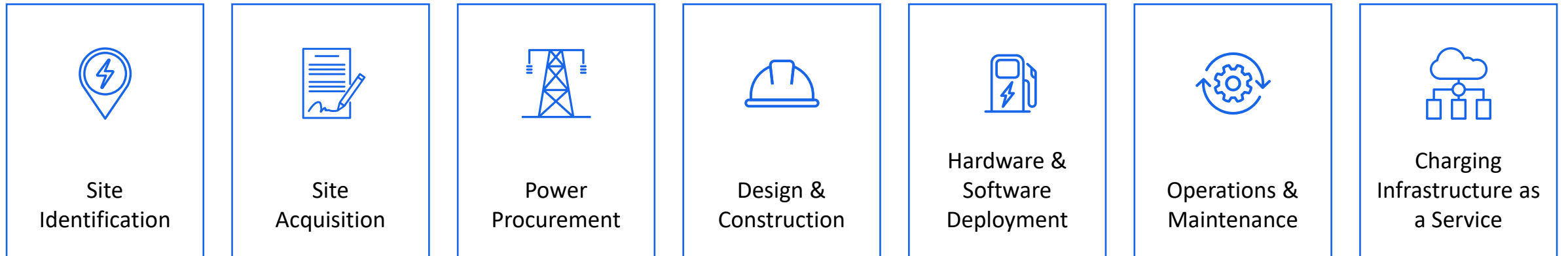


Automakers

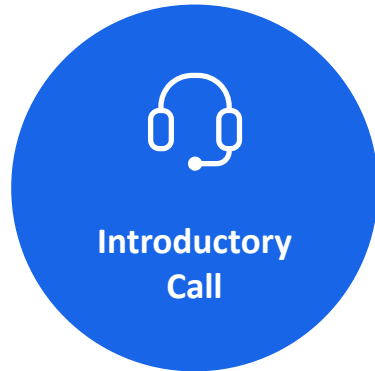
Your Go-To Partner For Electrification at Scale

From site selection through operations and maintenance, we offer a turnkey solution as a service, taking on the risk and capex, [so you can focus on your business.](#)

One strategic partner, one turnkey solution.



Engaging Utilities to Plan Your Project



Start engagement with a utility as soon as you know you'll be entering their market. Most will assist with feasibility reviews and identify any challenges to serving your project.

What utilities will need:

- Connected load of your project
- Address(s) of site or sites under consideration

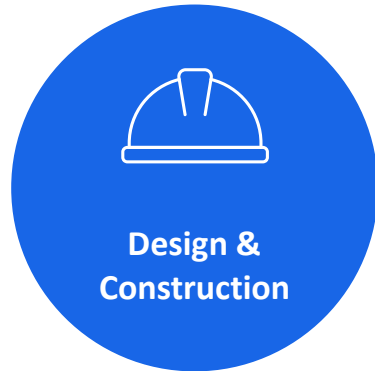


Utilities typically require a formal application to reserve your spot in line or reserve capacity for your project.

What utilities will need:

- Single line diagram
- Site plan
- Specification of equipment
- In service date

Executing Your Project



Your project will be assigned to a Designer or Engineer. This individual will be your main point of contact through the development phase.

What utilities will need:

- Contact and mailing info for contracts and invoices
- In-market resource that can meet on-site to review design and construction specifications



Once the electric distribution facilities have been installed, you're ready to meet the final utility requirements and energize your project!

What utilities will need:

- Individual addresses for each meter
- Inspection of metering equipment
- Permitting requirements depending on the project application

Together, we're making zero-emission transportation at scale a reality.

Adding to Voltera's long-term capital backing and critical infrastructure DNA is a rapidly growing team with deep experience and proven ability to deploy charging infrastructure at scale. Collectively we have enabled the deployment of more than 1,000 charging sites and have transacted on more than 10,000 properties.



Matt Horton
Chief Executive Officer



Pack Janes
VP, Strategic
Investments & Partnerships



Valerie Nilson
VP, People Operations



Scott Fisher
SVP, Sales &
Business Development



Hannah Jacobus
VP, Real Estate & Development



Thomas Ashley
VP, Government &
Utility Relations



Jonathan Colbert
VP, Marketing



Kit Ahuja
VP, Operations &
Energy Services

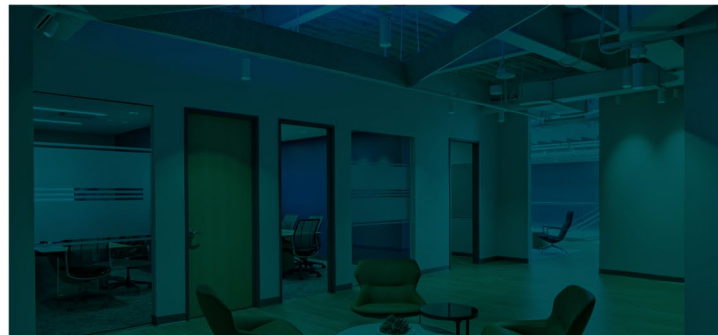
who we are

OUR VISION

We transform
building
infrastructure &
environments
to transform
business.



founded in
1999

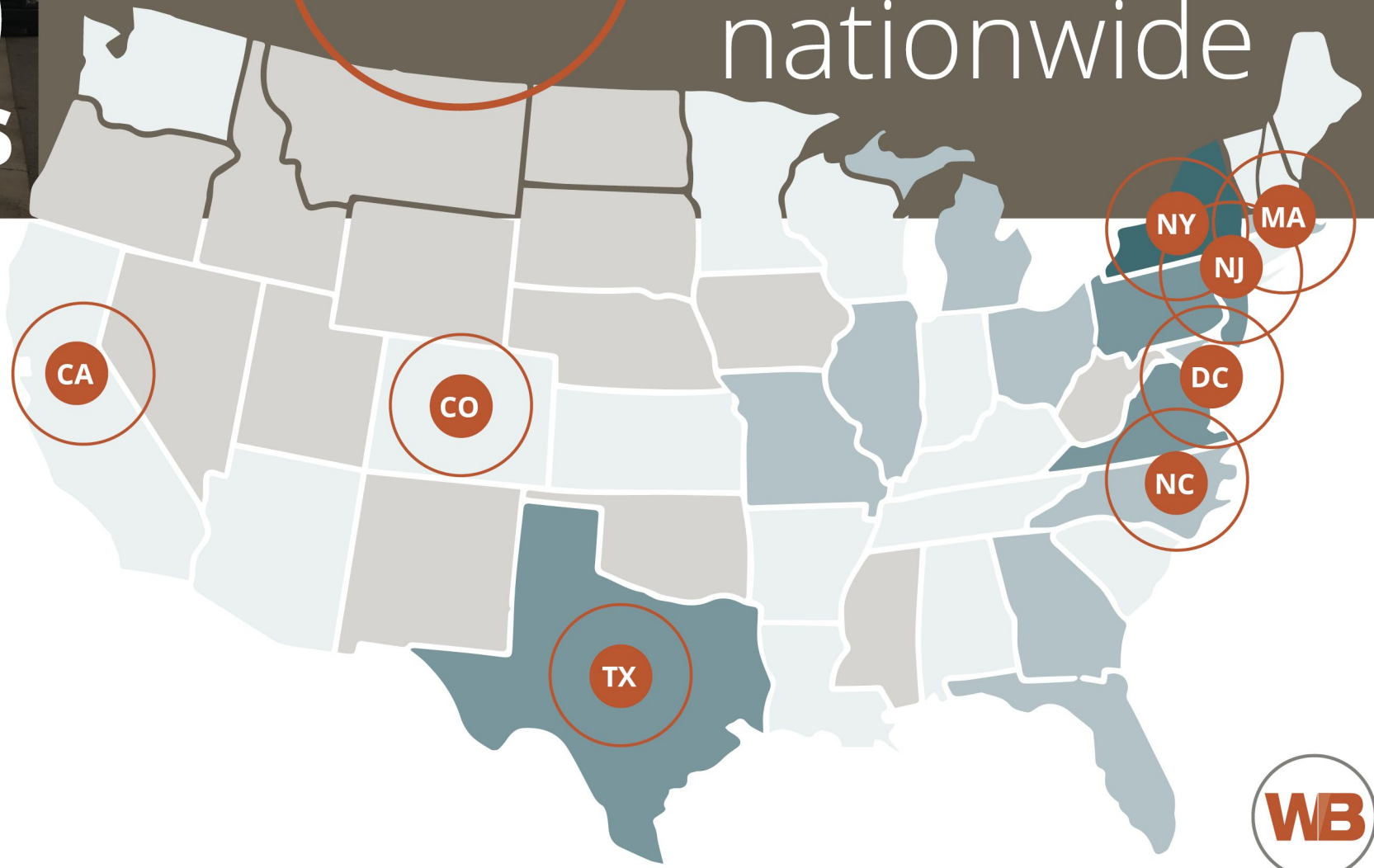


200
team members



worked in **500**
jurisdictions

12 offices
nationwide



OF ELECTRIC VEHICLE PROJECTS

- 1-49
- 50-99
- 100-149
- 150-200

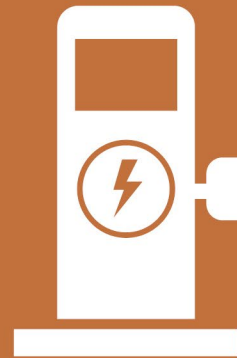


electric
vehicles

30 

team members on our
EV design team

we've worked with **115+**
utility providers



4,000+

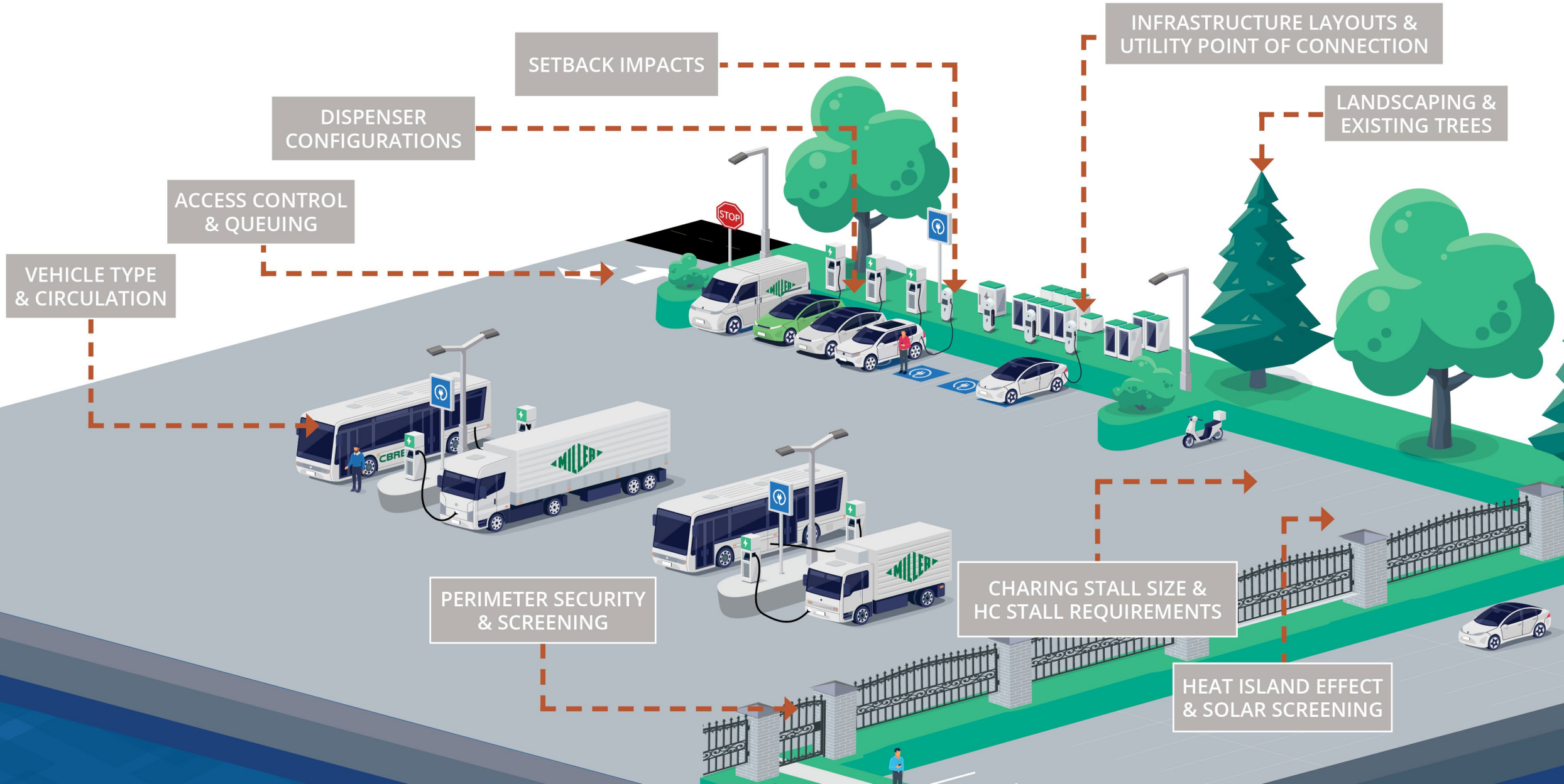
charging stations
designed throughout
north america



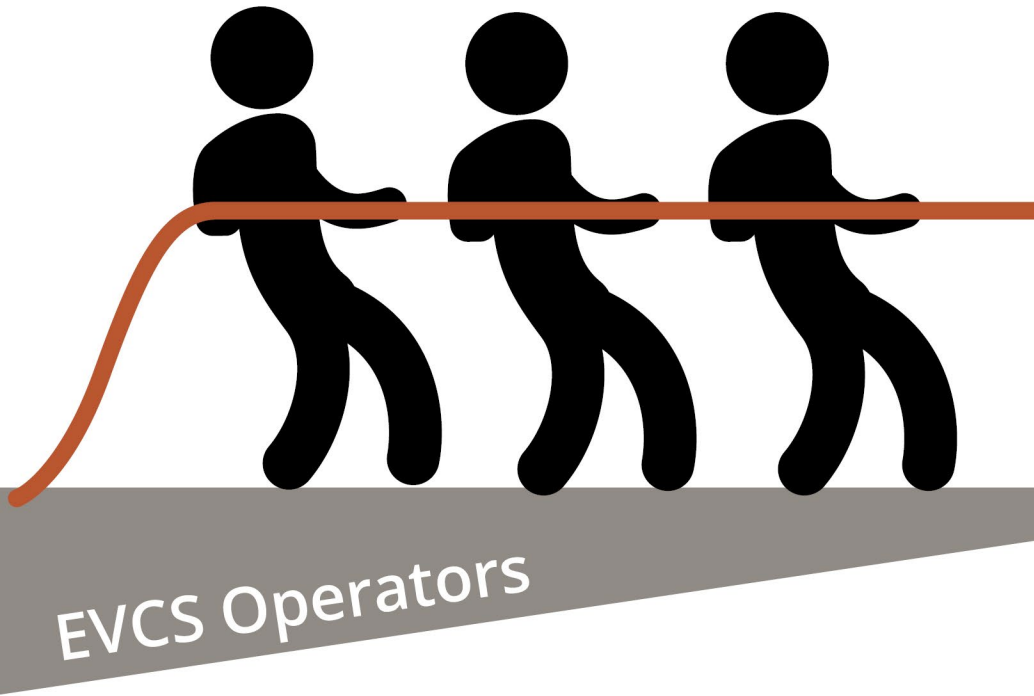
our clients



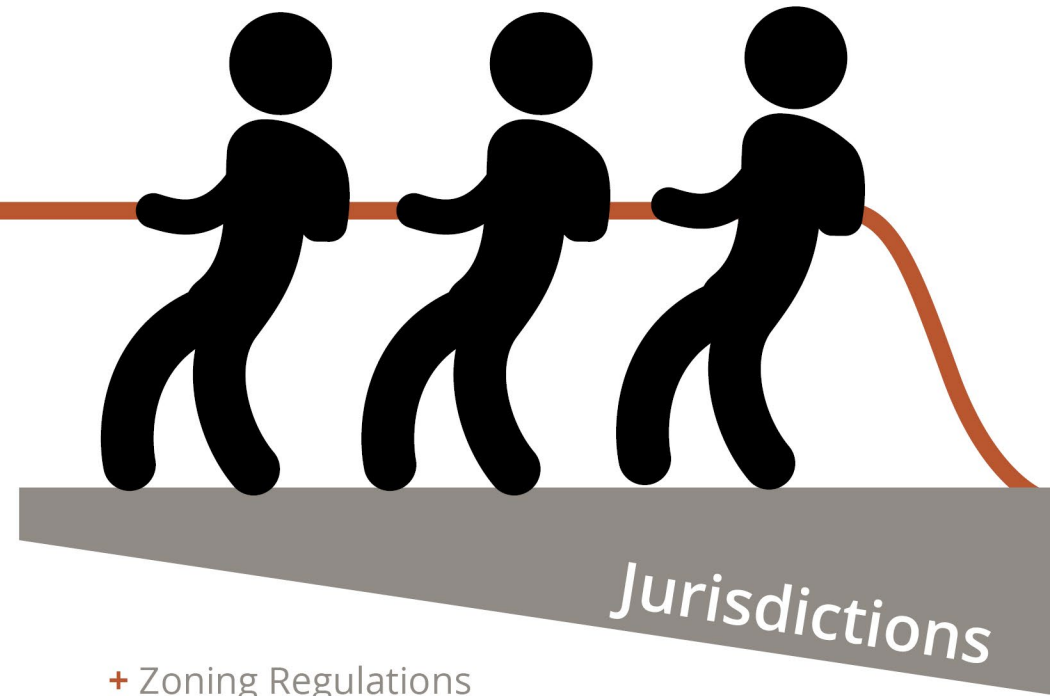
design considerations



permitting considerations



- + Early Concept Plan Review
- + Site Renderings
- + Education on Site Use & Impacts
- + Education on Special Accommodations
- + Education on System Components & Safety
- + Hearings & Presentation Materials



- + Zoning Regulations
- + Entitlements
- + Fire Marshal Impacts
- + Flood Zone Impacts
- + Site Development Submissions
- + Architectural Review Board Submissions
- + Landscape Submissions
- + Building Permit Submissions

Be Proactive

START EARLY & STAY AHEAD

- + Early Engagement with DP & AHJ is crucial
- + Greenfield Sites & Existing Uses differ
- + Project timeline contingencies are imperative
- + No two AHJs are alike
- + Zoning Regulations have not considered EV holistically
- + Education, Education, & Education
- + Have patience & work toward win/win solutions



Depot Discussion – Construction

Van D. Wilkins, Jr.
SVP Operations

InCharge Energy, Inc.
11625 Busy St
North Chesterfield, VA 23236

(804) 955-7847 m

(833) 772-4638 x800 office

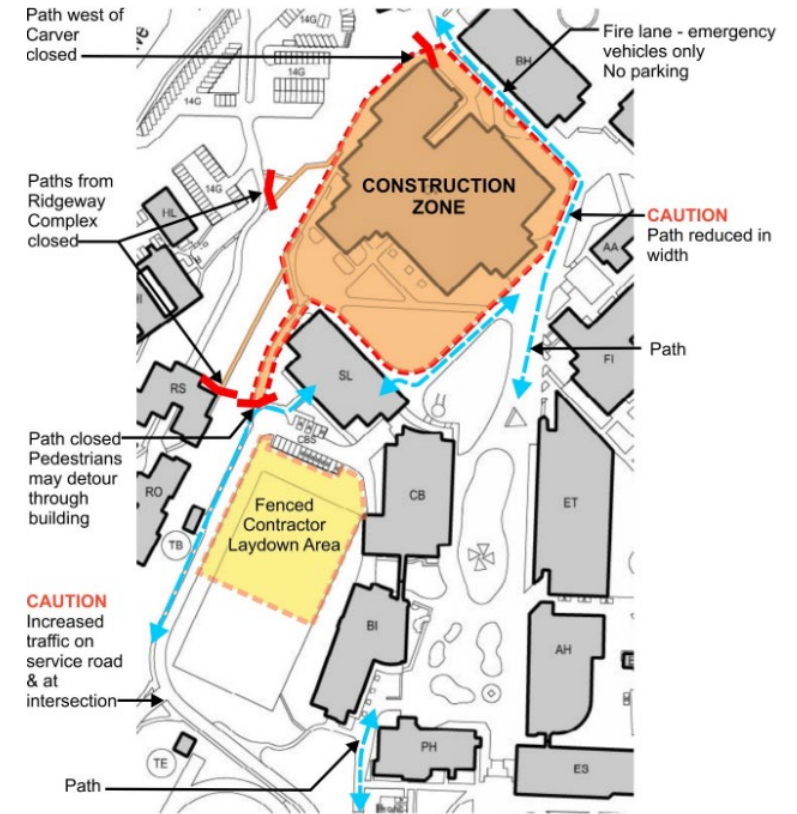
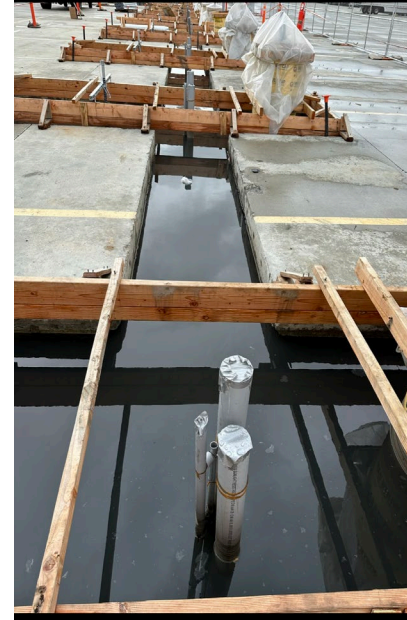
Van.wilkins@inchargeus.com

www.linkedin.com/in/vdwilkinsgoev



Construction – Operational Impact

- Traffic routing
- Excess vehicles
 - Construction Vehicles
 - Inspectors, Visitors, Out of Area Employees
 - Change Over (replacing old with new)
- Deliveries
- Storage
- Waste disposal
- Spoils
- Weather interruptions
- AHJ interruptions
- Contingency plans
- Will the GC or owner's rep. be onsite every day?

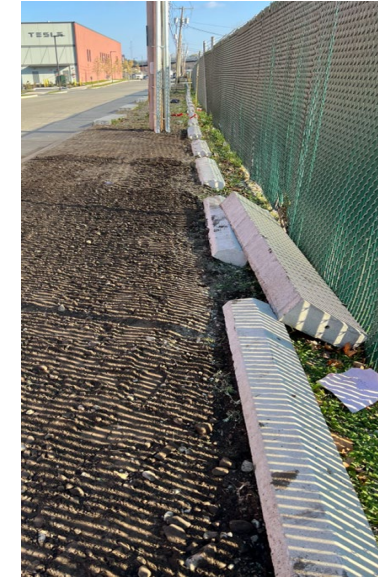


Pre-Plan before Start

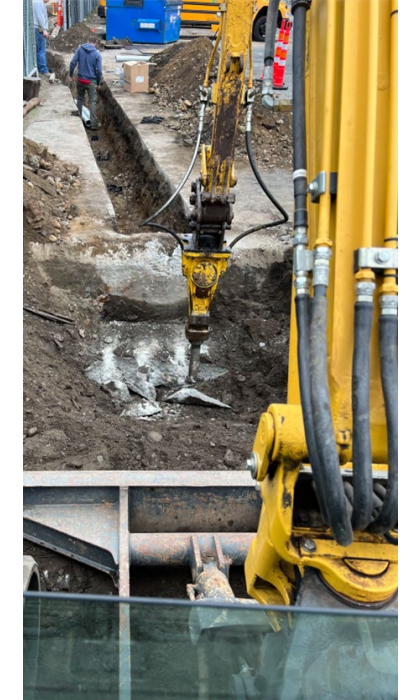
- Site Owner business interruption: Do a pre-plan, mark areas to be impacted with cones or marking paint to see impact on large vehicles, turning radius, unforeseen conflicts. What if problems arise during excavation
 - EX: Shut down Operational Parking/Drive area for several weeks (rain made it worse)
 - If site operational risk increases, like a long distance across parking – consider boring or other options like trench duct
- Underground utility marking
- Nice clean dirt can hide a problem
- Multiple types of heavy equipment
 - Backhoe , Jackhammers, Concrete Saws, Dump Trucks, Concrete Mixers, Trenchers, borers, Forklifts, Cranes



BEFORE



DURING



Civil Work

- Demolition of hard surfaces
- Spoils area
- Trenching Inspection Prior to Backfill
 - Document and Validate
- Inspection Prior to Concrete Pour
 - Validate conduit entry and placement
 - Any Manufacturer templates
 - Rebar sizing
- Backfill/Compaction in layers
- Restore (weather contingencies)
- Make ready (conduit/wire)
- Final boltdown



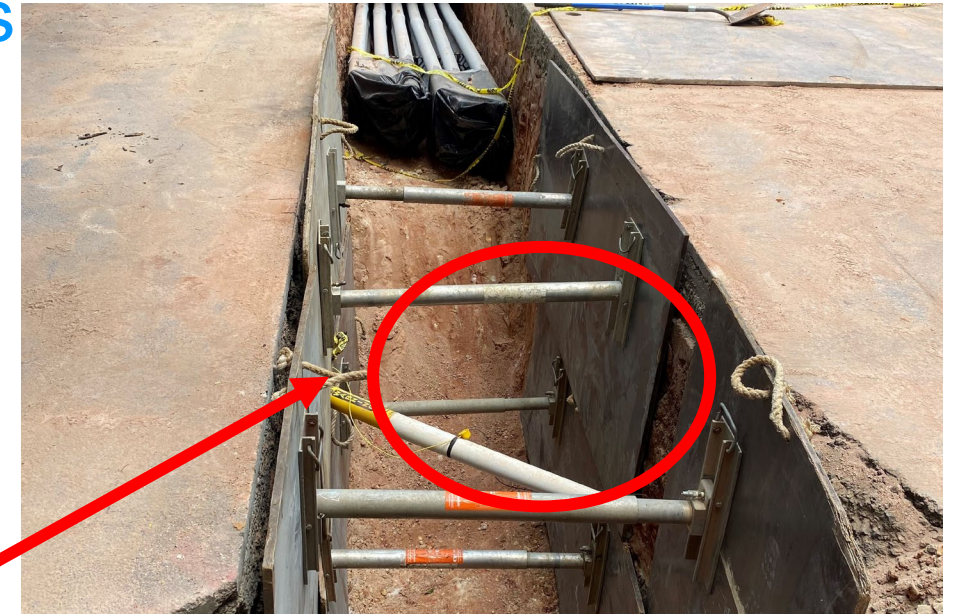
Utility Feed Installation

- Pathway from utility pole to the transformer
- Requires concrete the entire length to encase the MV conduits
- Time, operations planning around drive over areas, blocking entrances
- Clear scope and division of work
 - Utility
 - Line Crew
 - Subcontracted Crew for civil
 - Terminations Crew
 - Transformer Rigging Crew
 - Metering –keystone person
 - Owners Electrical
 - Conduit/Wire/Civil demarcation



Utility Upgrades – Trenching / Civil Concerns

- Caution tape is not an effective traffic control (for humans or vehicles)
- Steel plates for trench interruption mitigation (have equipment onsite to move and relocate them)
- Trench shoring plan
- Daily cleanup / secure for storms
- Dust control
- Mixed requirements
 - Utilities not under your control
 - Different code / finish expectations
 - Adjusting equipment locations or orientation
- Unforeseen issues
 - First a gas line mis-labeled as a fiber line
 - Existing 15kV Cables 12" below grade
- Utility location is not an exact science
 - Gas, water, fiber, electric, sewer markings not always consistent



Final Install and Energize

1. Wire Pull and Terminate
 1. Insulation Resistance tests
 2. Seal wire ends exposed to weather.
2. Charger Installation
 1. Owner's representative onsite –Document activities
 - a) Offloading from Truck
 - b) Unboxing
 - c) Review the plan for Rigging and setting
 - d) Observe installation



Poor Rigging Damaged before it even starts

1. Electrical acceptance testing
2. Arc flash risk labeling
3. Green tag from AHJ
4. Energize switchgear
5. Equipment startup



Commissioning Checklist

1. QC and Startup of Charger prior to Commissioning with Vehicles
2. Interoperability Report for comparison, (from either the Vehicle Manufacturer or Charger Manufacturer showing the Vehicle Charging Session parameters/performance for various profiles)
3. High Volume Production vehicle as a control for the test with similar voltage battery pack, (example Ioniq5 for Volvo VNR with 800VDC architecture)
4. Depot specific vehicles on hand to test during commissioning
5. Jumper Cables (12VDC battery issues)
6. CDL drivers available as needed to move vehicles or replicate conditions from a road trip
7. OEM rep from the Vehicle Manufacturer or their dealer available during commissioning
8. OEM rep from the Charger Manufacturer
9. Someone with access to the Charger backend or front-end software for diagnose and validation of charging profiles
10. One-Line Electrical Drawing and LOTO plan

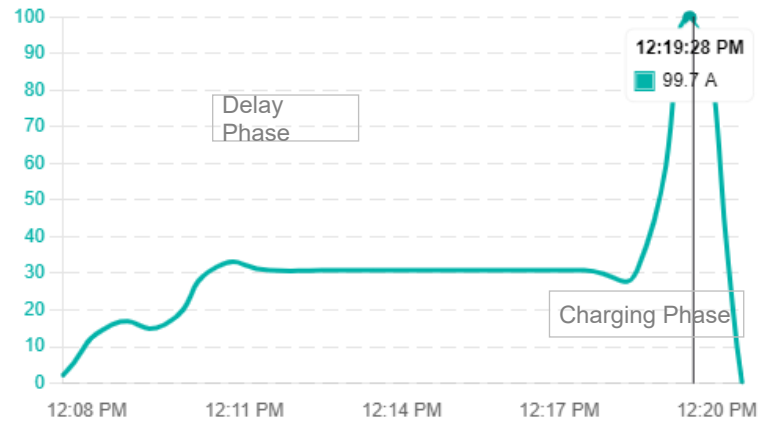


120kW – Graph Delayed Charging Session

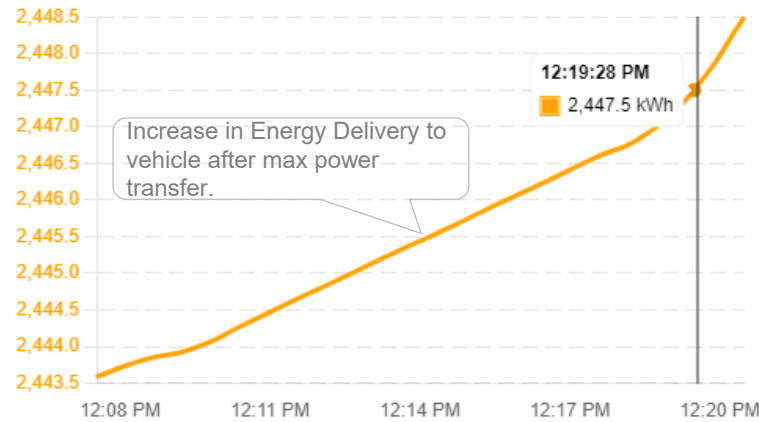
Test Case Description:

- The charger is set to a certain power level for a certain amount of time.
- When the time is up, the charger power rate defaults to the maximum power available

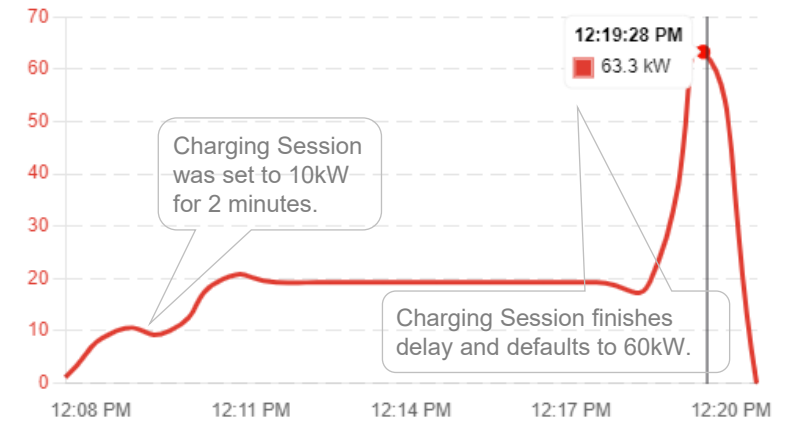
Charging Current (A)



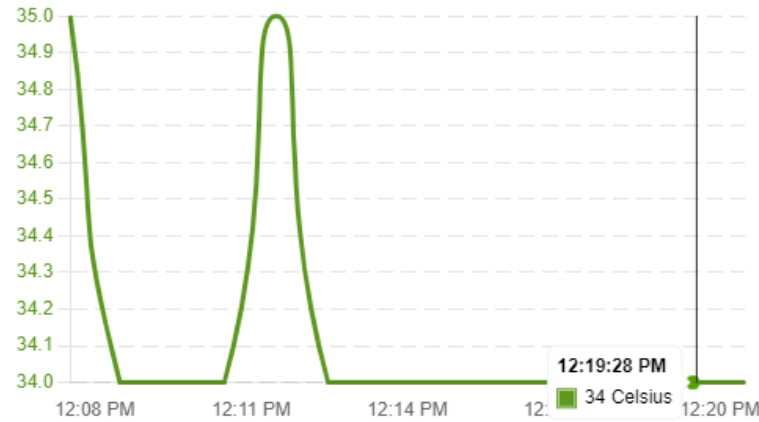
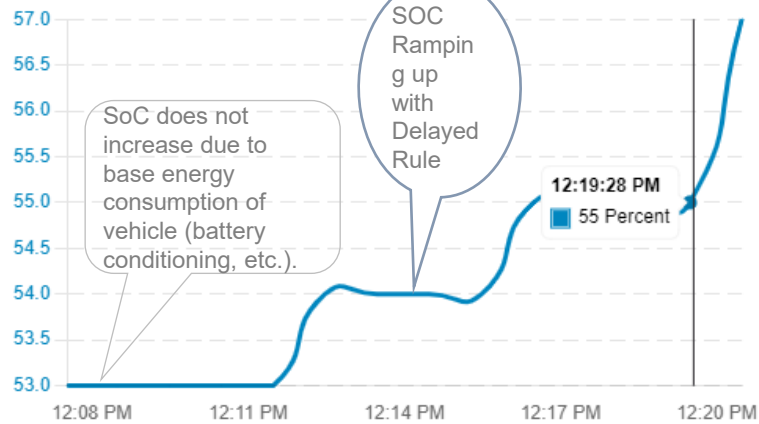
Lifetime Energy Dispensed (kWh)



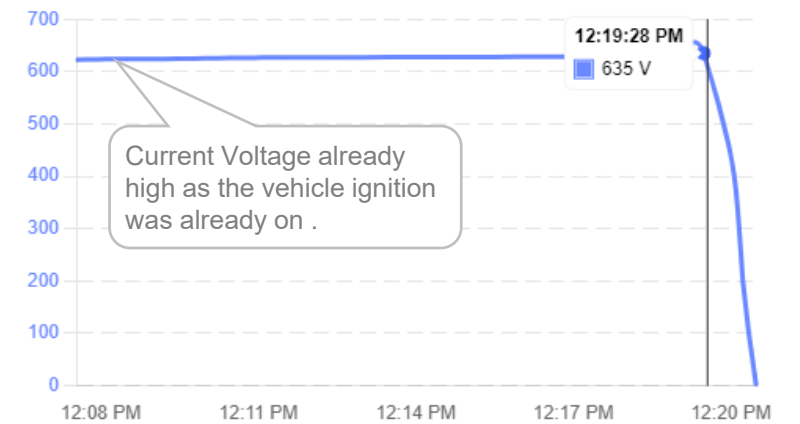
Charging Power (kW)



State of Charge (%)



Charging Voltage (V)



Successful delayed charging session shows that EV/EVSE communication and maximum power transfer is working properly.

Close Out Checklist

- Training sessions for Operations, Facilities, Safety, Fleet Team, Energy Team
 - Hardware
 - Software
 - Lockout Tag out planning
- Fire Department, First Responders, Towing Company
 - Vehicle specific
 - Microgrid specifics
 - Power shut offs for chargers
 - V2X specifics if in use
- Documentation (paper and/or digitized)
 - Verify delivery method for site
 - Hand off and acceptance
 - Punch List sign off all items corrected
 - As-Built drawings (PDF, DWG, PAPER)
- Key Log
 - Chargers
 - Microgrid
 - Power distribution
 - Data equipment



Thank You

Van D. Wilkins, Jr.

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Van.wilkins@inchargeus.com

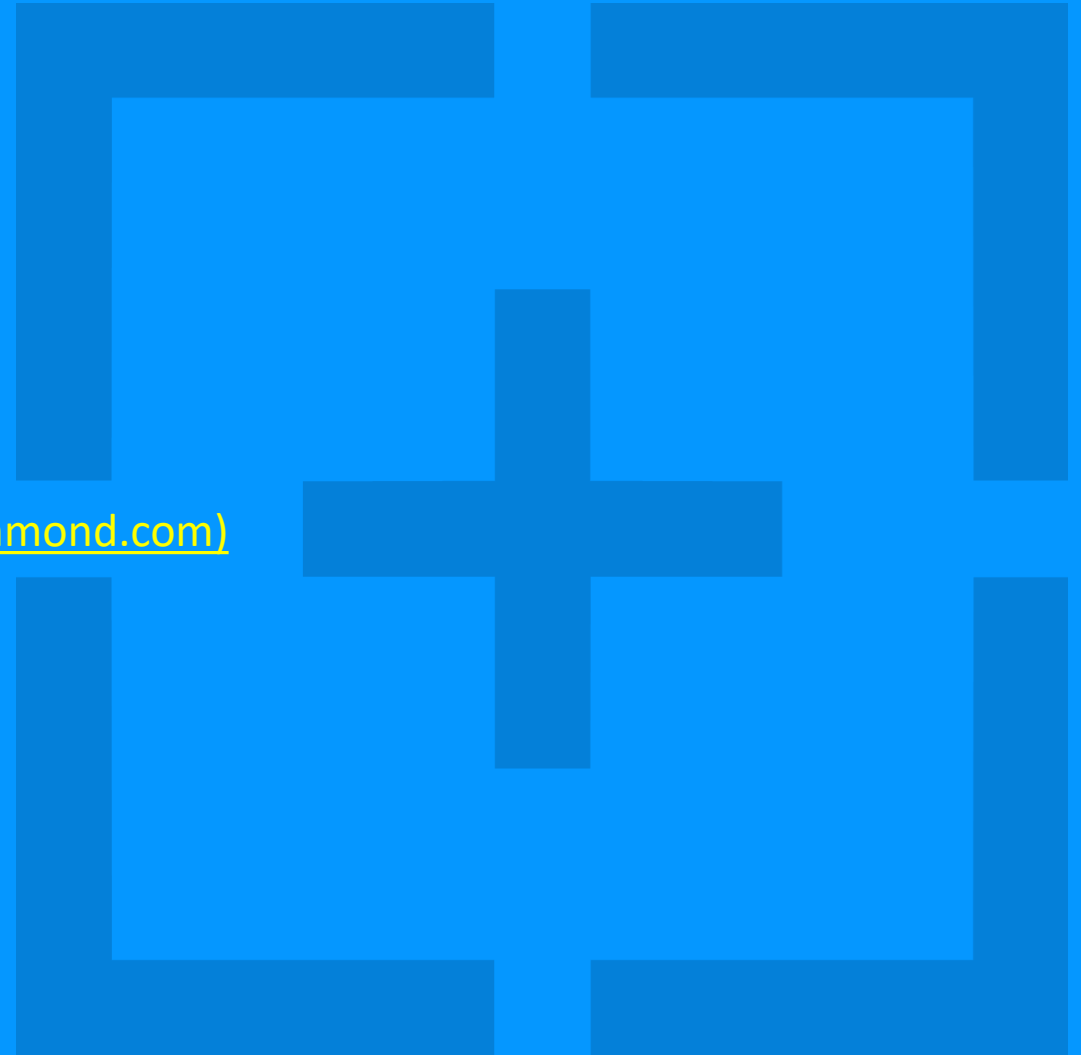
[VA company to make EV charging stations for U.S. fleets \(richmond.com\)](https://richmond.com)

<https://youtu.be/BR6cN6siMVI?feature=shared>

[News - InCharge Energy Inc. \(inchargeus.com\)](https://inchargeus.com)



We Bring the Power



Electric Depot Site Planning and Construction



Gregory Brenner
*Principal and Managing
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WB Engineers+Consultants



Hannah Jacobus
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Voltera



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*E-Mobility Sales and Business
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NextEra Energy Mobility



Van Wilkins
*Senior Vice President of
Operations*
InCharge Energy



Hosted by:
John Richardson
Electrification Consultant





CCS1



CCS2



CHAdeMO



J1772



MCS or CharIN



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RunOnLess.com

Let's Stay Connected...
... And charged up!



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