

# I-80 STAKEHOLDER CONVENING & FUNDING UPDATES

**WHEN:** WEDNESDAY, NOVEMBER 9

**WHERE:** JOLIET JUNIOR COLLEGE



I-80 MID-AMERICA  
**CLEAN FUELS  
CORRIDOR**  
A greener way across the USA

## Welcome

Argonne  
NATIONAL LABORATORY



Illinois Department  
of Transportation



# Welcome: Those participating via Zoom



- Participants are in listen-only mode
- Post your questions at any time in Q&A
- Event recording and slides available shortly
- Please complete event questionnaire

# Agenda

- Overview and purpose
- Policies and programs
- Utility considerations
- Break
- Investments
- Resources
- Local success stories
- Next steps
- Lunch

# Organizers



**Argonne National Laboratory:** Marcy Rood, Marianne Mintz & Tom Stephens

**Chicago Area Clean Cities:** Samantha Bingham and Bethany Kraseman

**Chicago Area Clean Cities & Green Ways 2Go:** Tim Milburn

**Illinois Department of Transportation:** Elizabeth Irvin and Chris Schmidt

**Trillium:** Marc Rowe

**Ozinga Energy:** Ryan Jacobs

**North American Council on Freight Efficiency (NACFE):** Dave Schaller







JOLIET  
JUNIOR COLLEGE  
—1901—

# Campus Welcome

Maria Anna Rafac

Sustainability Coordinator  
Joliet Junior College

# WELCOME!!

## Sustainability @ JJC

- Here at JJC we have a long history of sustainability initiatives since we moved onto this property in the 1960's.
- Here are just a few highlights!



# Sustainability is one of our Core Values!!

- Joliet Junior College recognizes that true sustainability involves a commitment to environmental, social, and economic improvement. Joliet Junior College encourages planning, solutions, and actions that provide benefits for students, employees, and the community.
- The core values at JJC for sustainability go hand and hand with the 3 pillars of sustainability people, planet, and profit.

# Sustainability Union

## Mission and Vision

- Our mission is collaboration with individuals, clubs, and organizations. Promote social responsibility, reduce our negative impact on the local environment, and to conserve and respect our resources that are vital and necessary for life.
- Our vision is that individuals collaborate to create a more sustainable future for all.



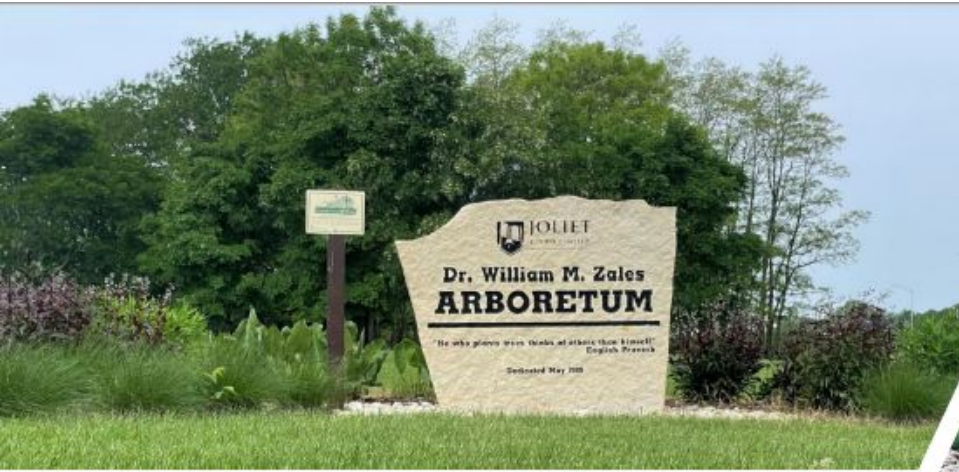


# Environmental Pillar

- Our natural areas are over 400 acres with 2.75 miles of paved and unpaved trails and home to a calcareous Fen, remanent oak and hickory savannah, remanent tall grass prairie, deciduous forest, rock run creek, and JJC campus lake.
- The Dr, William M. Zales arboretum is now a certified Level II arboretum.









# Economic Pillar

- JJC is home to a 3,542 solar panel array, 2 geothermal wells fields, and all natural plantings.
- JJC also has 6 certified LEED building with one being our greenhouse, which is the first LEED certified greenhouse at a community college. Other buildings include Health Professions, Campus Center, Facility Services and the Natural Sciences and Automotive additions.



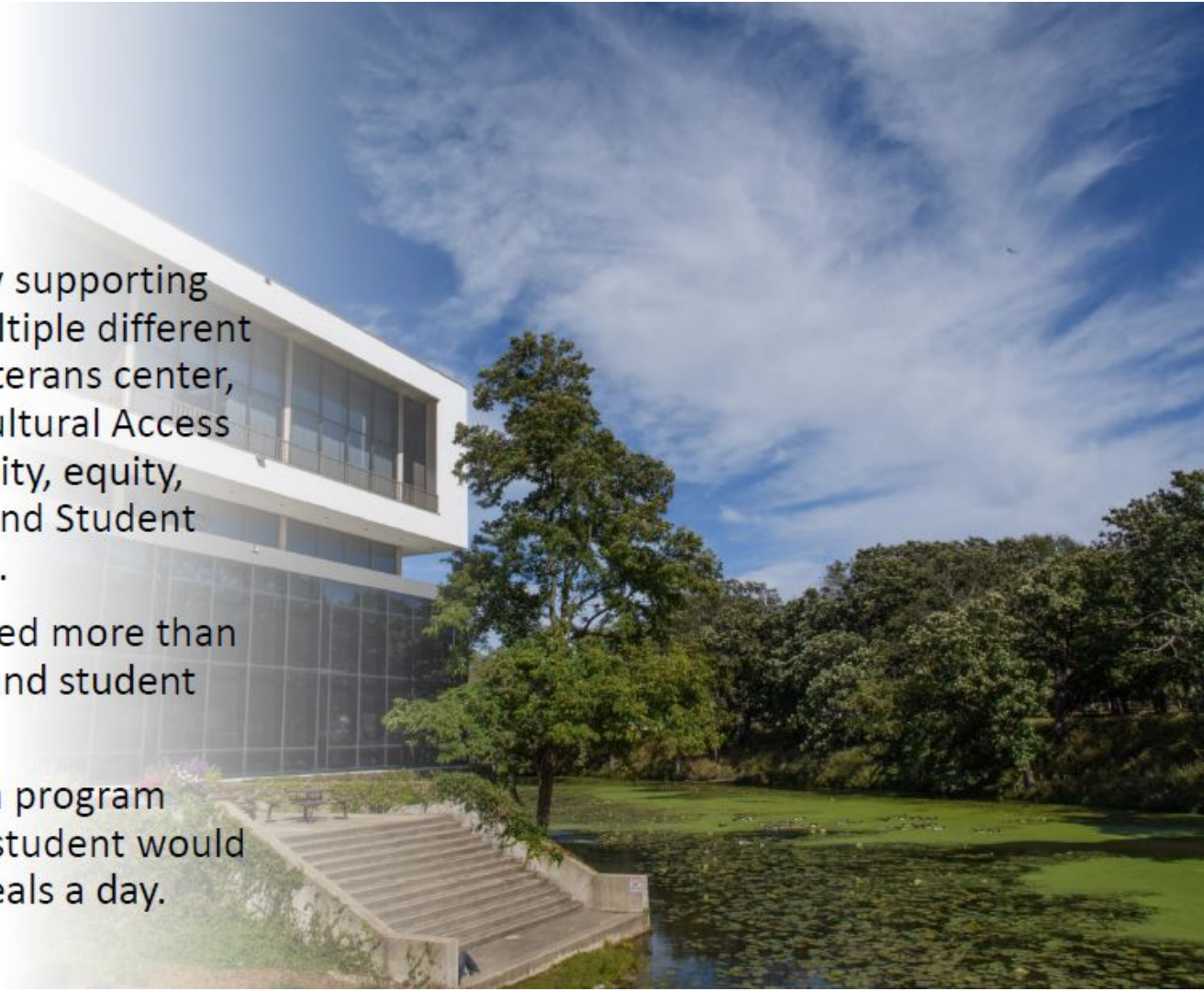






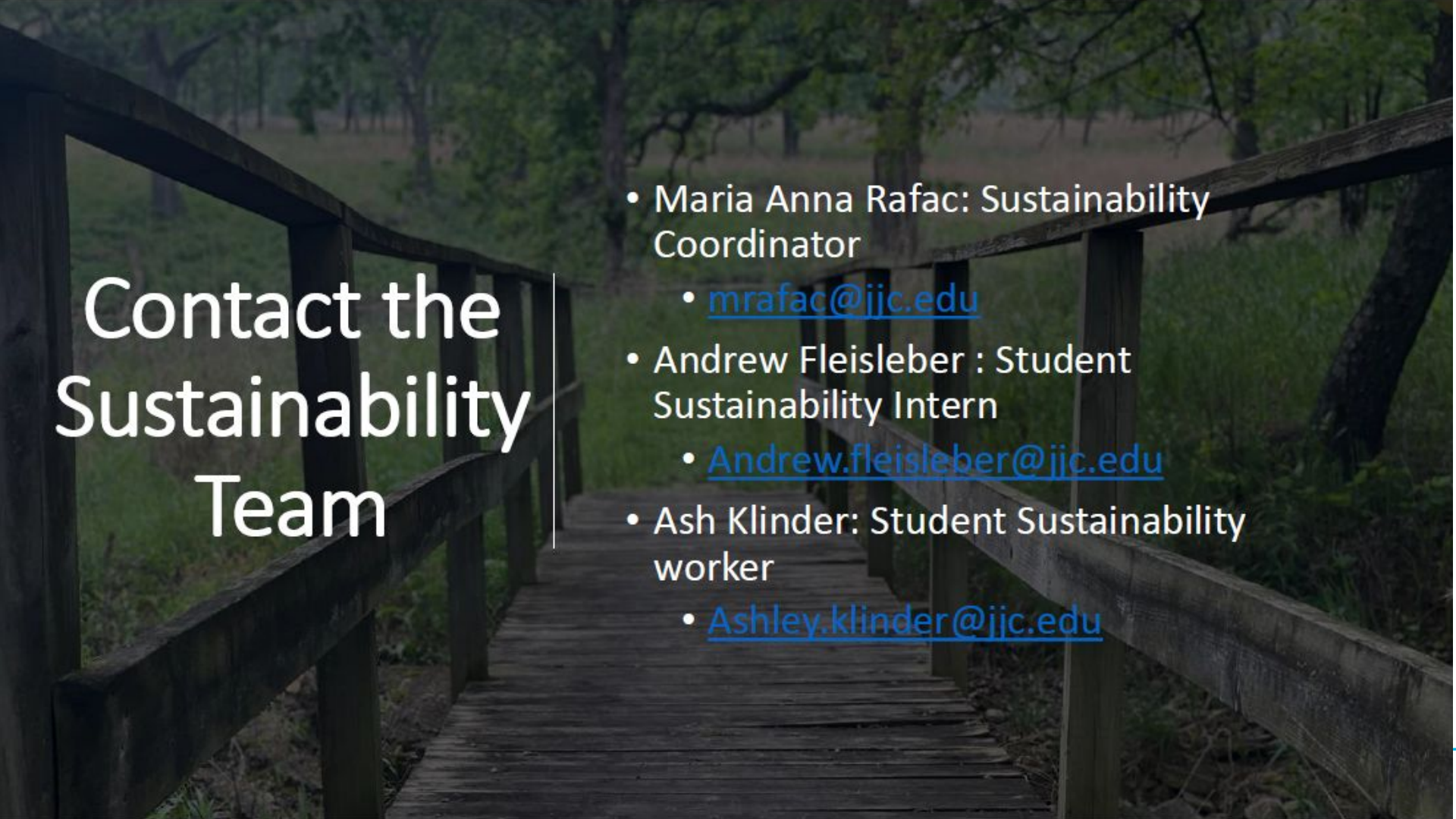
# Equity Pillar

- JJC hits the equity pillar by supporting the student body with multiple different departments including Veterans center, Disability services, Multicultural Access & Success, Office of diversity, equity, inclusion, & compliance, and Student Mental Health & Wellness.
- The JJC Foundation awarded more than \$870,000 in scholarships and student emergency funds.
- During Covid JJC also ran a program called JJC Eats where any student would be able to get two free meals a day.









# Contact the Sustainability Team

- Maria Anna Rafac: Sustainability Coordinator
  - [mrafac@jjc.edu](mailto:mrafac@jjc.edu)
- Andrew Fleisleber : Student Sustainability Intern
  - [Andrew.fleisleber@jjc.edu](mailto:Andrew.fleisleber@jjc.edu)
- Ash Klinder: Student Sustainability worker
  - [Ashley.klinder@jjc.edu](mailto:Ashley.klinder@jjc.edu)



# Regional Welcome

Denise Winfrey  
Board Member, Will County Board

# Overview and Purpose

Tom Stephens  
Principal Transportation Analyst  
Argonne National Laboratory



*I-80 MID-AMERICA*  
**CLEAN FUELS  
CORRIDOR**

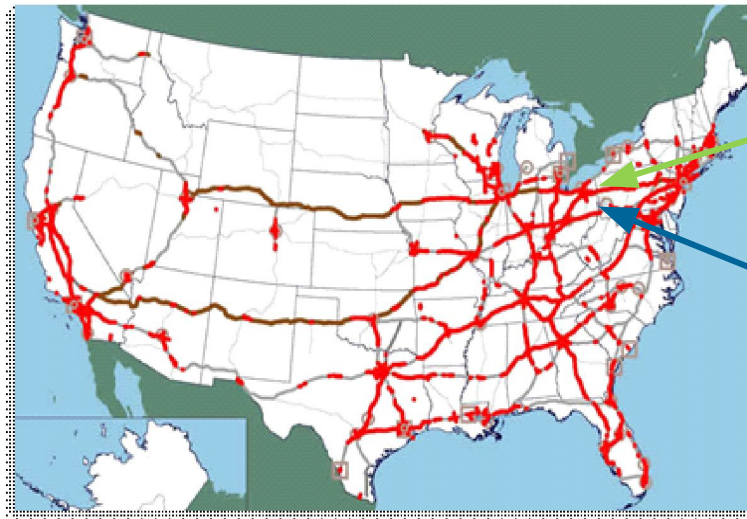
A greener way across the USA

Tom Stephens  
Principal Transportation Energy Analyst  
Argonne National Laboratory

# Fixing America's Surface Transportation Act – FHWA's Alternative Fuels Corridor Program

FHWA designated highest volume portions of I-80 Corridor "Ready" or "Pending" in November 2016

FHWA designated highest volume portions of I-70 Corridor "Ready" or "Pending" in April 2019



- IDOT/Argonne collaboration to develop alternative fuel corridors and multi-state nominations
- **FHWA funding to develop deployment plan with outreach and education to flip I-80 to EV and NGV Ready**
- Multiple jurisdictions and partners in planning (FHWA, Argonne, 6 state DOTs, 7 Clean Cities Coalitions, multiple utilities, stakeholders and infrastructure providers)



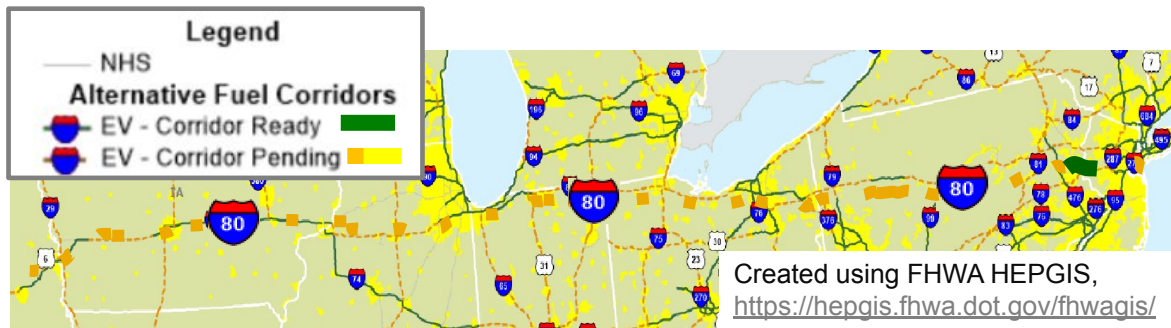
# FHWA Designated I-80 Corridor



Created using FHWA HEPGIS,  
<https://hepgis.fhwa.dot.gov/fhwagis>

- CNG readiness criteria:

- Publicly available within 5 mi of exit
- Locations no more than 150 mi apart
- Locations providing fast fill



Created using FHWA HEPGIS,  
<https://hepgis.fhwa.dot.gov/fhwagis/>

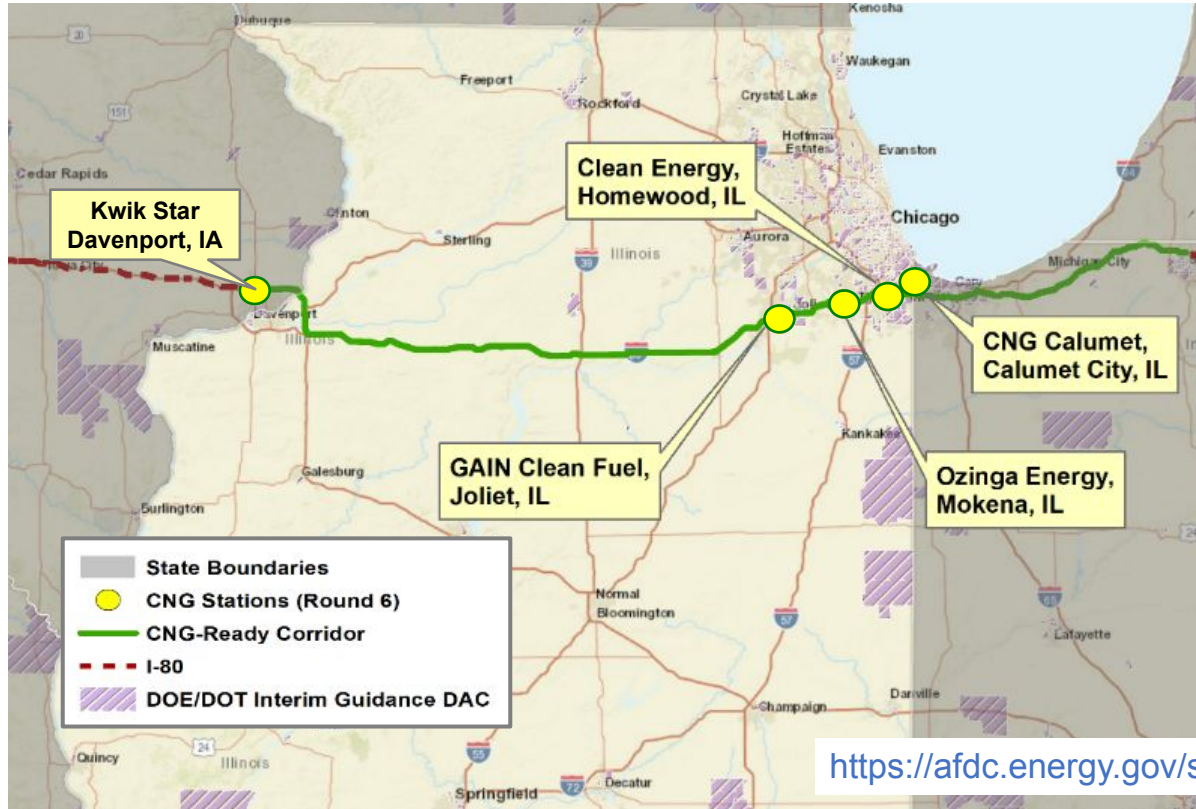
- EV readiness criteria:

- Public charging within 1 mi of end of exit ramp
- Locations no more than 50 mi apart
- Locations with at least (4) CCS-1 ports ( $\geq 150$  kW)



# FHWA Designated I-80 CNG Corridor

I-80 is CNG-Ready in Illinois



# FHWA Designated I-80 EV Corridor

I-80 is EV Pending throughout Illinois

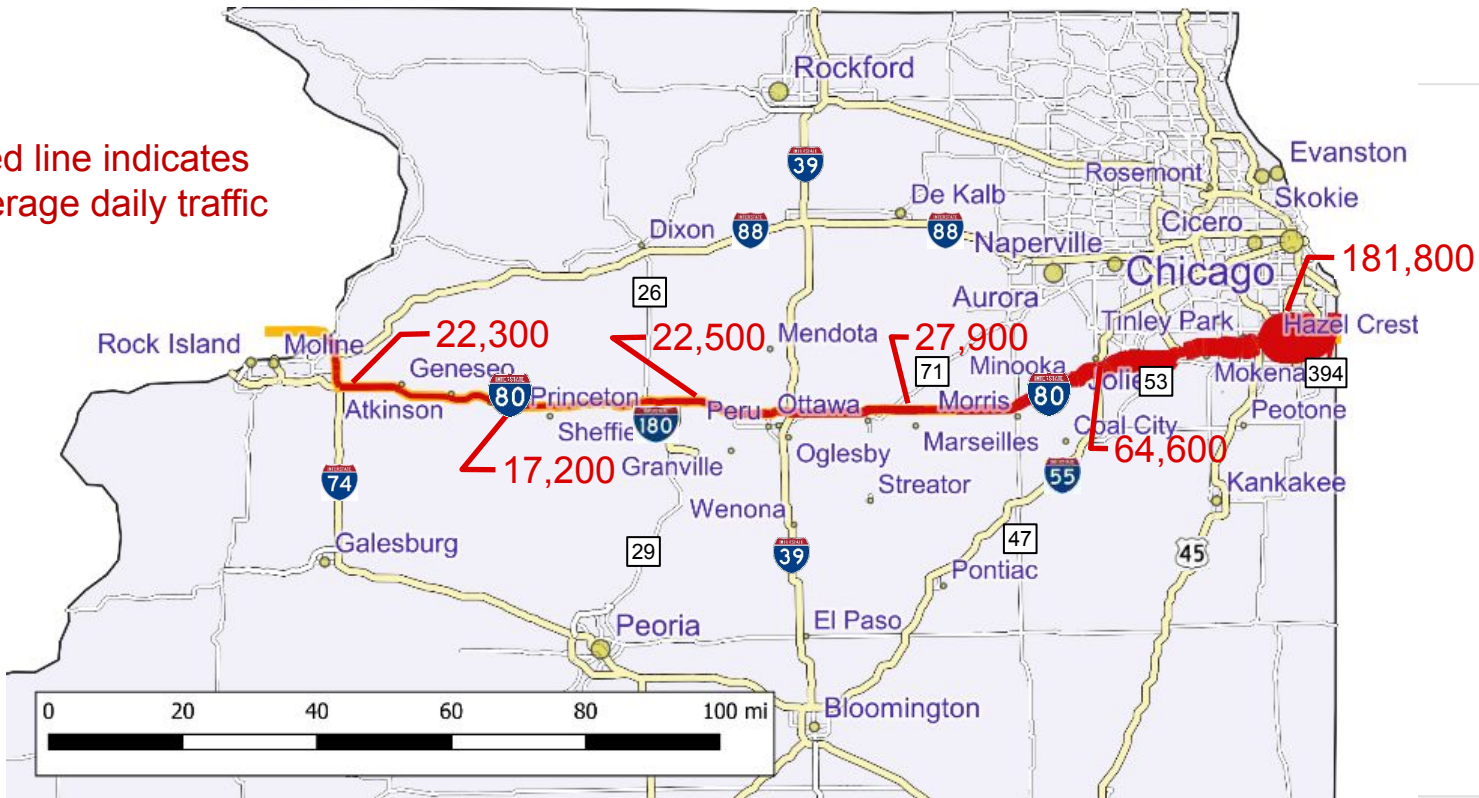


<https://afdc.energy.gov/stations/#/find/nearest>

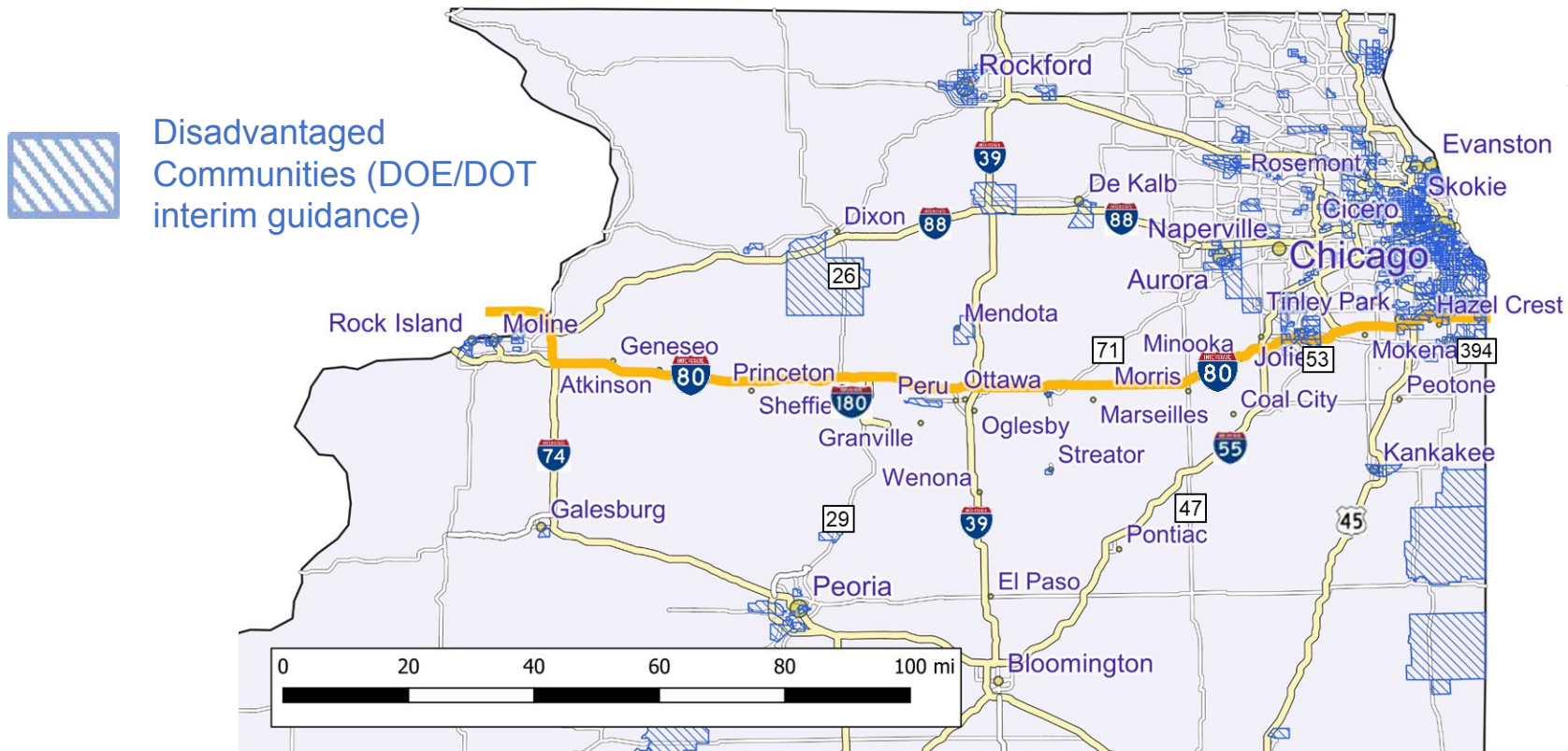
# Cities and Traffic on I-80

## Higher population density and traffic in eastern Illinois

Width of red line indicates annual average daily traffic



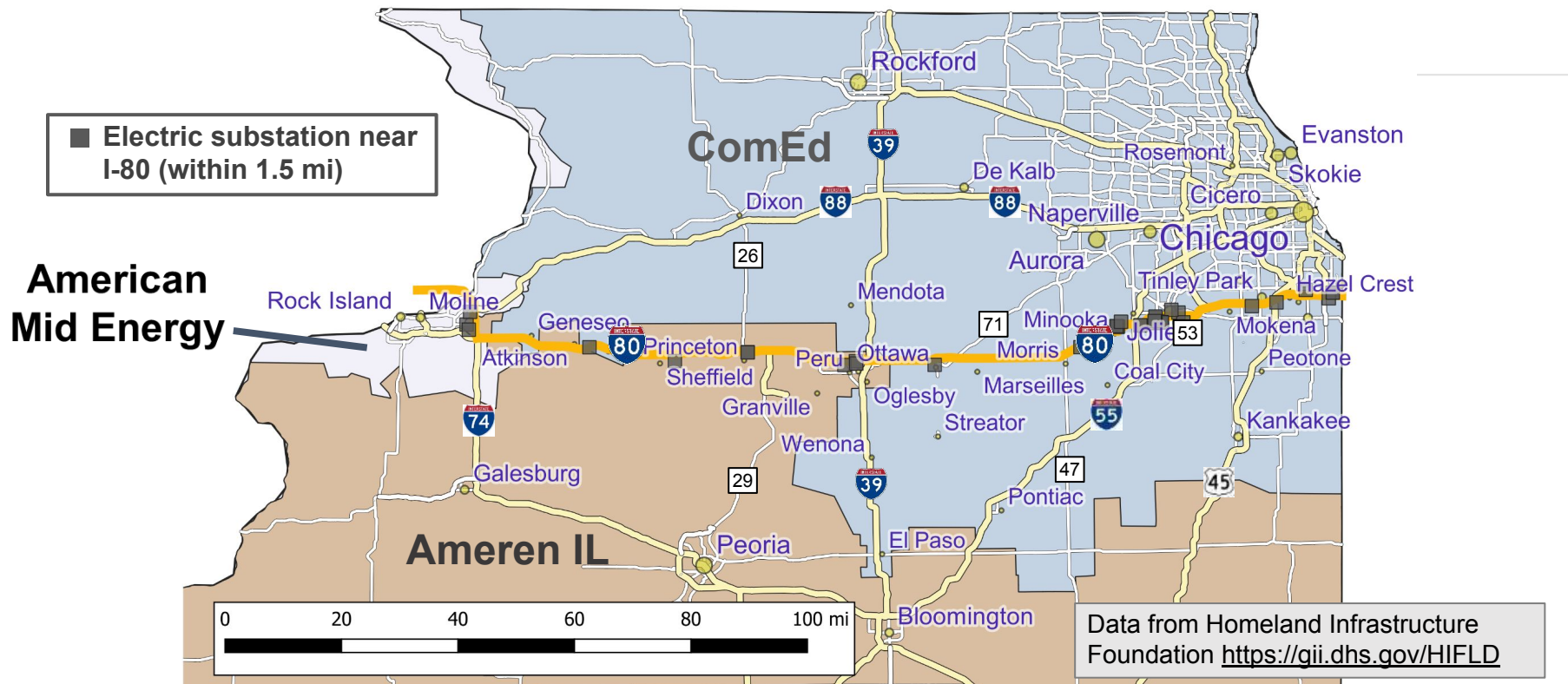
# Disadvantaged Communities along I-80



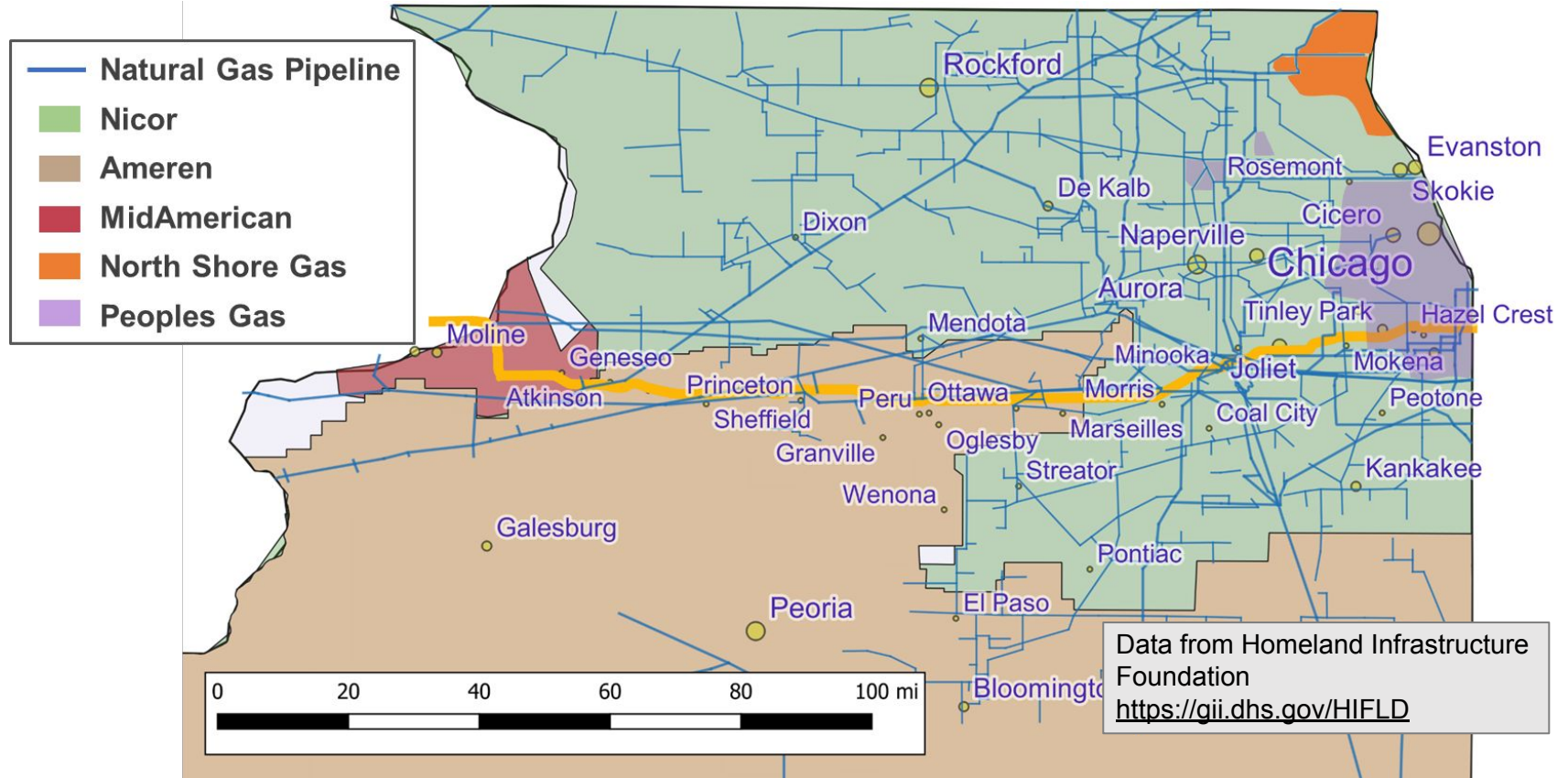


## Electric Utilities and Substations near I-80

## I-80 goes through ComEd and Ameren Illinois service territories

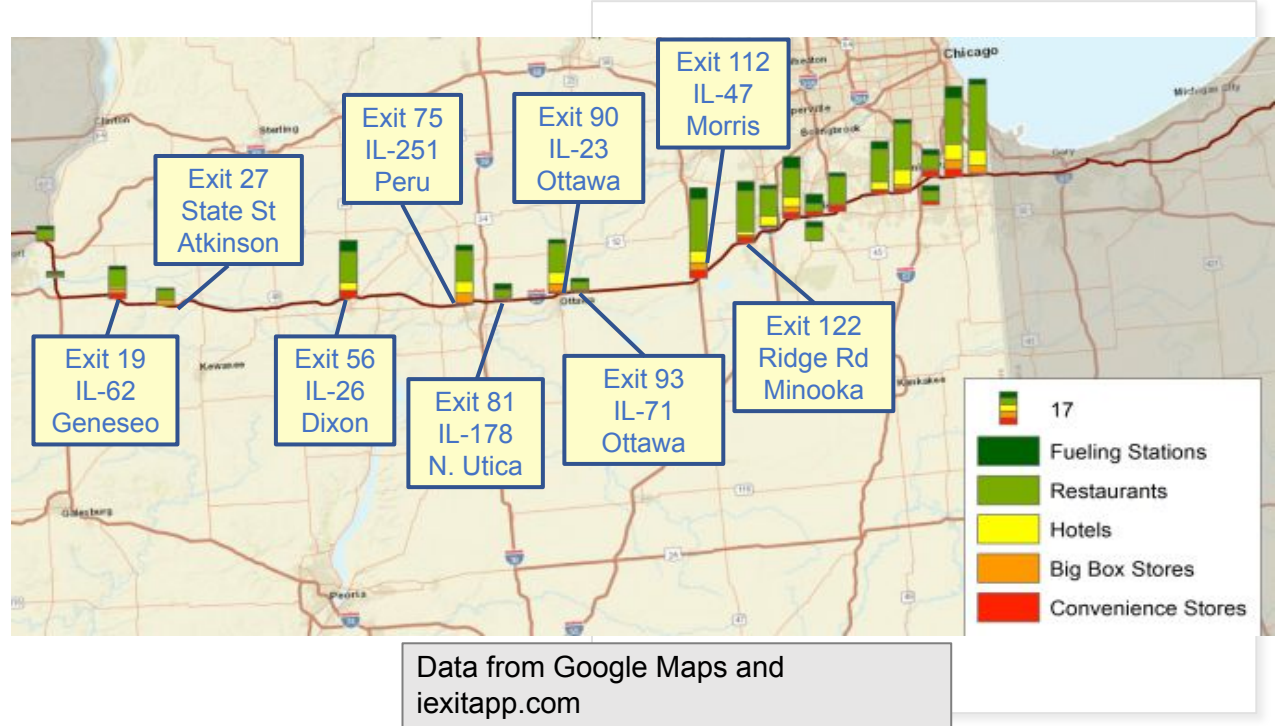


# Many Natural Gas Pipelines Serve Northern Illinois



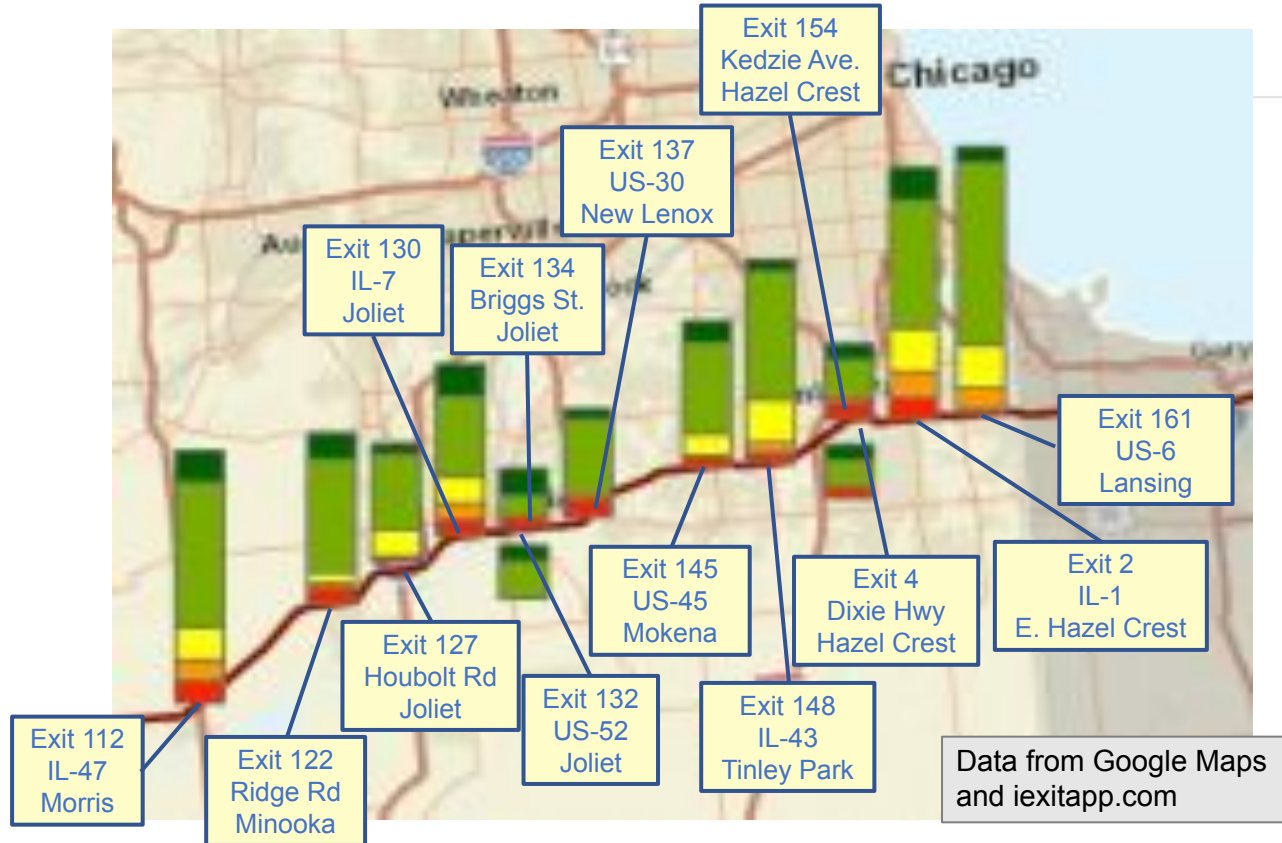
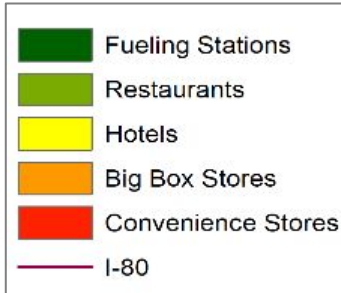
# Other Useful Criteria: Where People (or Trucks) Go or Stop Enroute

- Amenities tend to be concentrated in and around urban areas and major interchanges
- Most amenities have ample parking and serve other travel needs
- Suitability differences: EV charging aims to increase access in underserved communities while NG fueling aims to reduce emissions and traffic burden on disadvantaged communities



# Amenities Where People (or Trucks) Go or Stop Enroute

- Amenities tend to be concentrated in and around urban areas and major interchanges

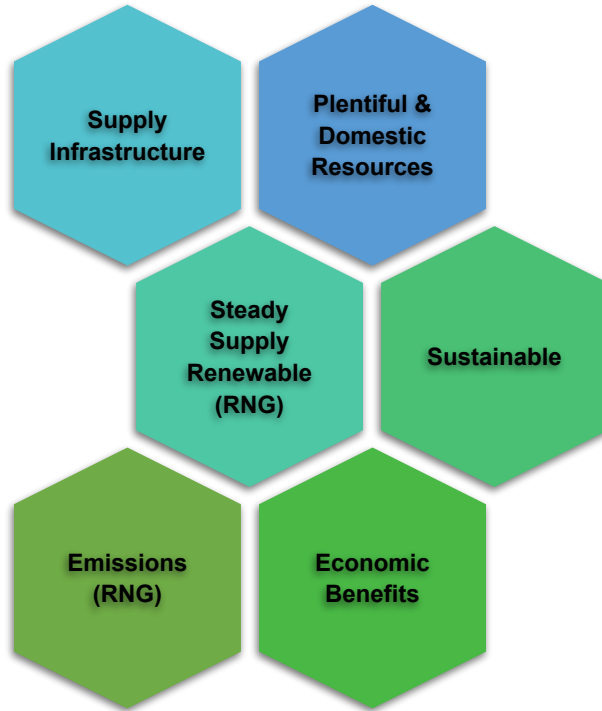




# Benefits of Electric and Compressed Natural Gas (CNG) Vehicles

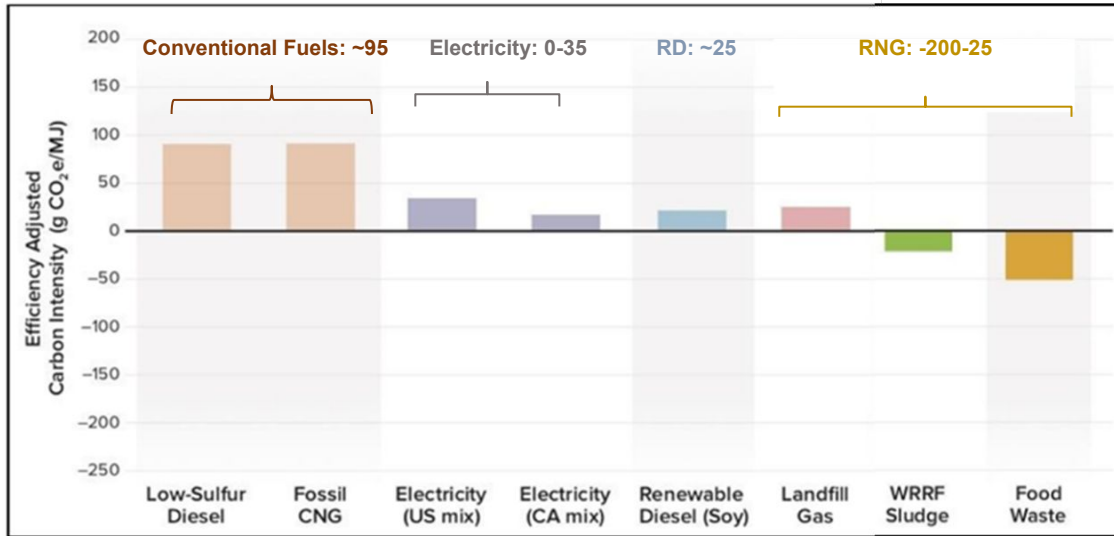
Tom Stephens  
Principal Transportation Analyst  
Argonne National Laboratory

# Benefits of Alternative Fuels



- Electric and natural gas grids are ubiquitous
- RNG and electricity — produced from plentiful domestic and increasingly renewable feedstocks — are readily available here and now
- Support sustainability goals
- Create jobs due to increased energy demand and infrastructure expansion
- RNG can provide additional environmental benefits (reducing odor and runoff) and a steady supply of renewable energy

# Electricity & Renewable Natural Gas (RNG) Can Cut GHG Emissions from Heavy Trucks by 75% or More



- Greenhouse Gas (GHG) emissions are typically measured from “well-to-wheel” to capture full fuel cycle of energy production and use.
- GHGs for EVs depend on how electricity is generated.
- Because RNG production often prevents emissions of methane (more powerful than CO<sub>2</sub>) it can have NEGATIVE Carbon Intensity.
- Carbon Intensity of RNG from animal manure (not shown) varies greatly and is often below -200.

<https://www.anl.gov/esia/reference/renewable-natural-gas-rng-for-transportation-frequently-asked-questions>

# Policies and Programs Supporting Alternative Fuels

Elizabeth Irvin

Deputy Director  
Office of Planning & Programming

Christopher Schmidt

Air Quality Manager

Illinois Department of Transportation



# **Electric Vehicle Infrastructure planning in Illinois**

I-80 Planning Project

Elizabeth Irvin & Chris Schmidt

- EV planning in Illinois
- What is NEVI?
- Highlights of IL NEVI planning
- Other state programs for EVs
- Getting involved

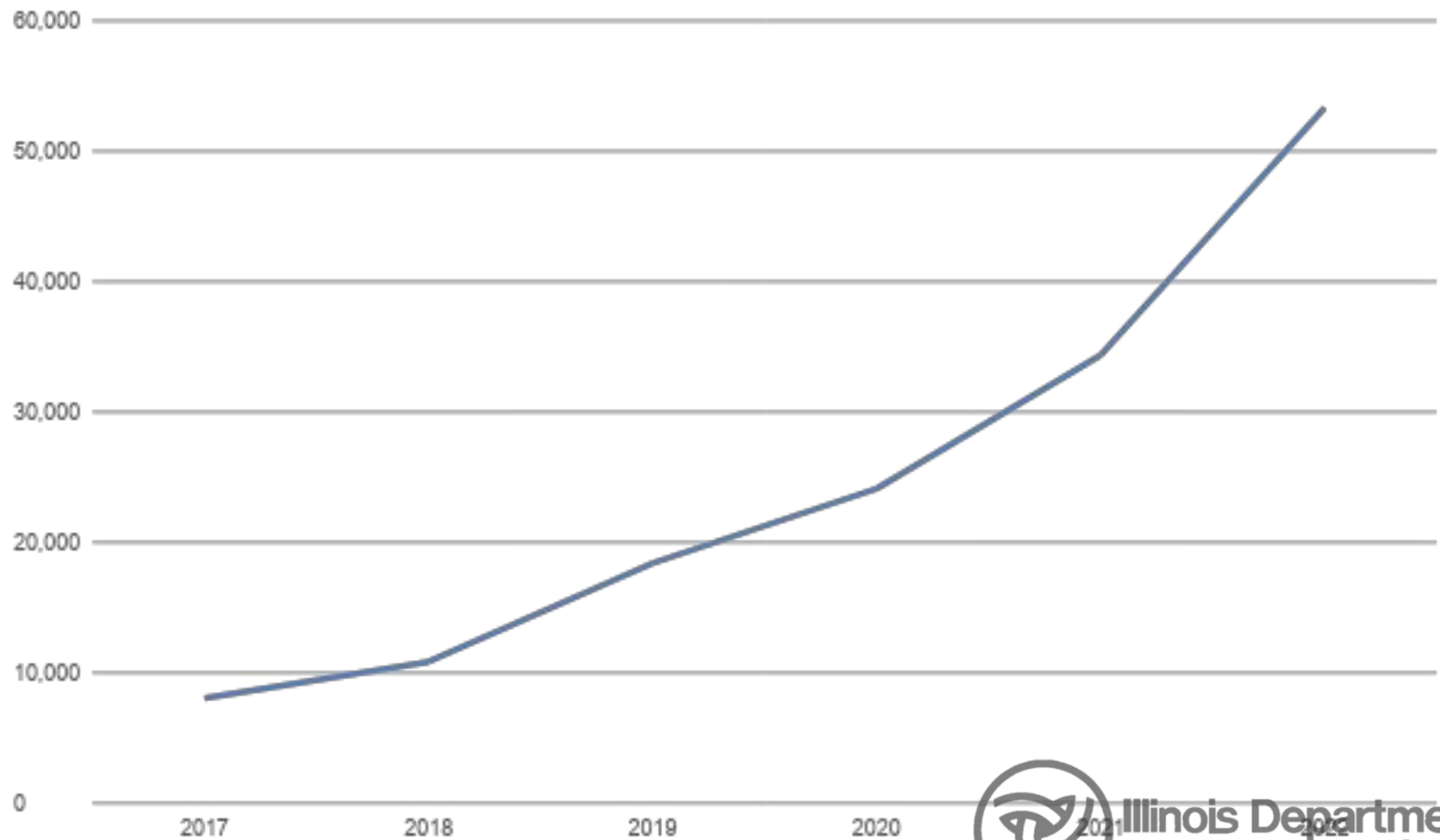




# **EV PLANNING IN ILLINOIS**

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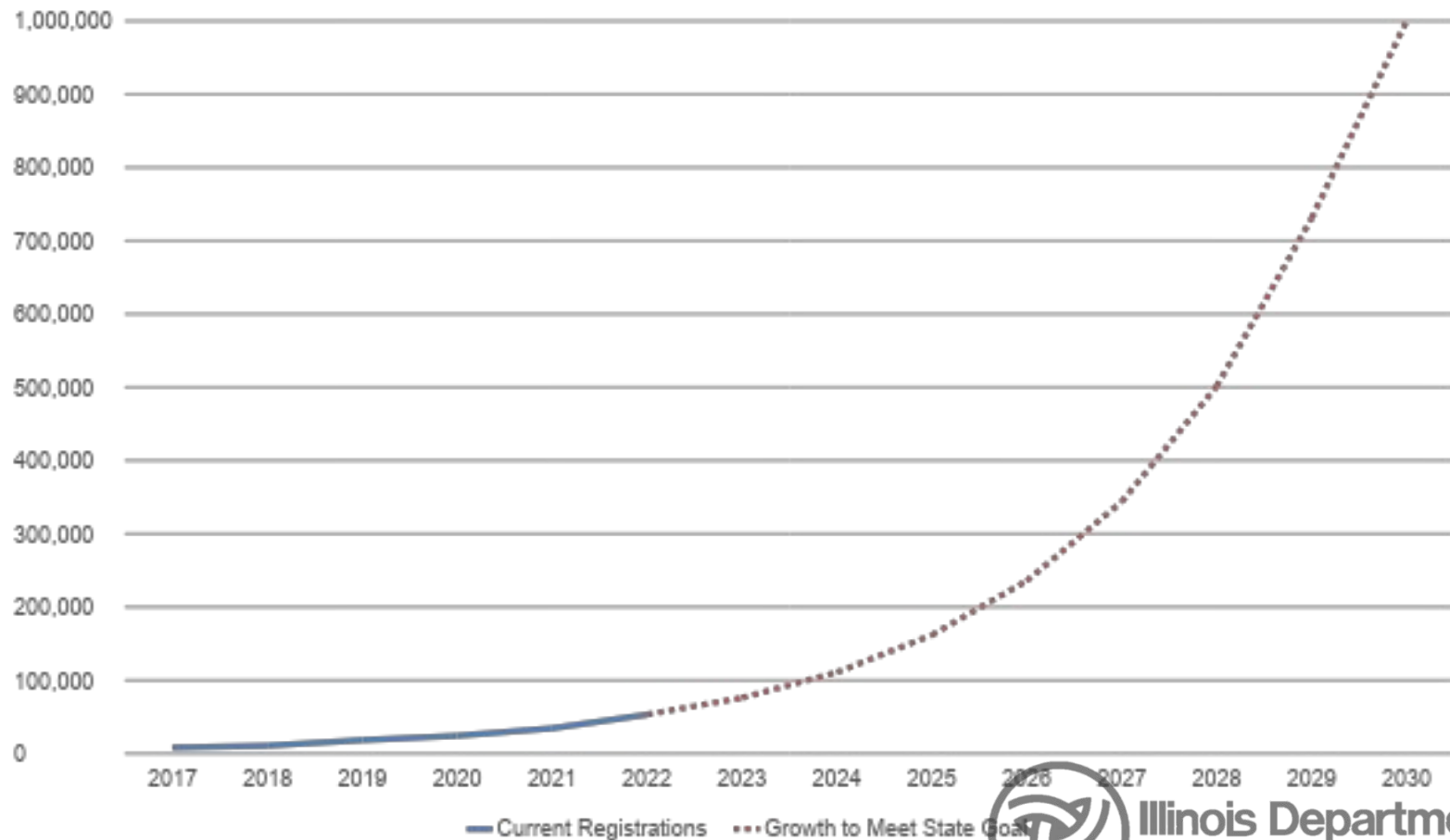
## Electric Vehicles Registered in Illinois



Illinois Department  
of Transportation



## Electric Vehicles Registered in Illinois



**Illinois Department  
of Transportation**

# Electric Vehicle Coordination in Illinois

- Illinois Environmental Protection Agency (IEPA)
- Illinois Department of Transportation (IDOT)
- Illinois Commerce Commission (ICC)
- Department of Commerce and Economic Opportunity (DCEO)
- Central Management Services (CMS)
- Illinois Finance Authority (IFA)
- Illinois Power Agency (IPA)
- Illinois Department of Natural Resources (IDNR)



Illinois Department  
of Transportation

# Meeting Illinois' goal of 1 million EVs by 2030

- Supporting EV manufacturing in Illinois
- Incentivizing consumer EV purchasing
- Electrifying the state fleet
- Electrifying transit and freight
- Updating the electric grid
- Building out a statewide public charging network



“Here in Illinois, we enacted a nation-leading climate action plan. That includes putting 1 million electric vehicles on the roads by 2030 & providing \$4,000 electric vehicle rebates.” -Gov. Pritzker



# **WHAT IS NEVI?**

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# National Electric Vehicle Infrastructure Program

- On November 15, 2021, President Biden signed the \$1 trillion bipartisan infrastructure bill Infrastructure Investment and Jobs Act or IIJA.
- IIJA includes \$7.5 billion in dedicated funding to help make EV charging accessible to all Americans for local and long-distance trips.
- That \$7.5 billion is comprised of a \$5 billion formula program and a \$2.5 billion discretionary grant program



# NEVI Formula Program

- Provides dedicated funding to states to strategically deploy **public EV charging infrastructure**
- Illinois will receive **\$148 million** from this federal program between 2022-2026
- Initially, funding under this program is **directed to designated Alternative Fuel Corridors** to provide electric vehicle charging infrastructure **stations every 50 miles** and **no more than 1 mile off the designated corridor**
- When the alternate fuel corridor network is fully built out, funding may be used on any public road or in other publicly accessible locations



Illinois Department  
of Transportation

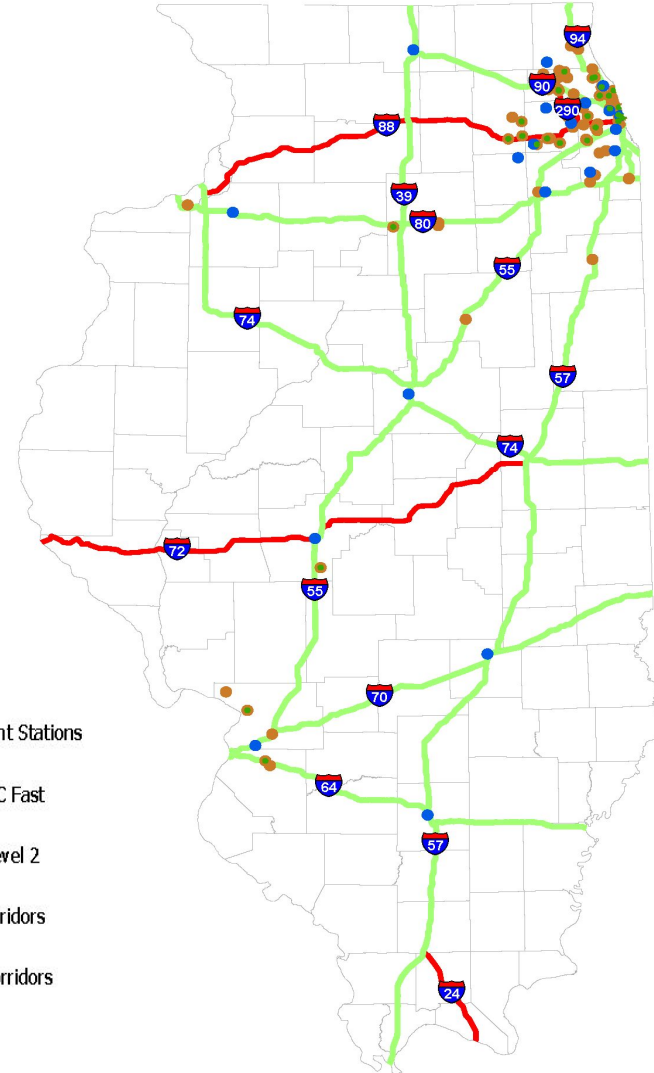


# Illinois Alternative Fuel Corridors

- **Electric Vehicle Signage Ready**
  - I-39 from Rockford IL to Sun Prairie WI
  - I-55 from Chicago IL to Bolingbrook, IL
  - I-74 from IL/IA border to IL/IN border
  - I-80 from IL/IN border to Joliet IL
  - I-90 from IL/IN border to Sun Prairie WI; and, from La Crosse WI to Sparta WI
  - I-94 from Sun Prairie WI to IL/IN border
- **Electric Vehicle Signage Pending**
  - I-39 from Normal IL to Rockford IL
  - I-55 from Joliet IL to St. Louis
  - I-80 from Joliet IL to IL/IA border
  - I-70 from St. Louis to Indiana border
  - I-57 from Chicago to Missouri border
  - I-64 from St. Louis to Indiana border

## Legend

- IL NEVI Compliant Stations
- IL EV Stations DC Fast
- IL EV Stations Level 2
- NEVI Eligible Corridors
- Undesignated Corridors
- Illinois Counties



# What is Public EV Charging?

- **Public Charging** = stations available to the public **24 hours a day, 7 days a week**
- Public charging **does not** mean free charging
- **Fast Charging** = at minimum, 4 combined charging system (CCS) plugs capable of each charging at 150 kilowatts per hour (kWh)
- At minimum, **4 vehicles can charge at the same time**, at a charging speed that will **fully charge an average EV in under a half hour**



# Program Timeline

- **August 1, 2022:** Illinois submitted NEVI plan to Federal Highways
- **August 22, 2022:** Comment period closed on Notice of Proposed Rulemaking for NEVI minimum standards and requirements
- **September 30, 2022:** Deadline for Federal Highway Administration to approve state plans or notify State DOTs that changes are needed
- **Fall/Winter 2022:**
  - NEVI Funds available for states to begin investing in public charging
  - Illinois conducting additional stakeholder engagement and refining procurement strategy
  - Final rulemaking on NEVI minimum standards and requirements
  - Guidance published on \$2.5 billion discretionary grant program





# **HIGHLIGHTS OF THE ILLINOIS NEVI PLAN**

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# Plan Vision and Goals



## ECONOMY

Improve Illinois' economy by providing transportation infrastructure that supports the efficient movement of people and goods.

## LIVABILITY

Enhance the quality of life across the state by ensuring that transportation investments advance local goals, provide multimodal options, and preserve the environment.

## MOBILITY

Support all modes of transportation to improve accessibility and safety by improving connections between all modes of transportation.

## RESILIENCY

Proactively assess, plan and invest in the state's transportation system to ensure that our infrastructure is prepared to sustain and recover from extreme events and other disruptions.

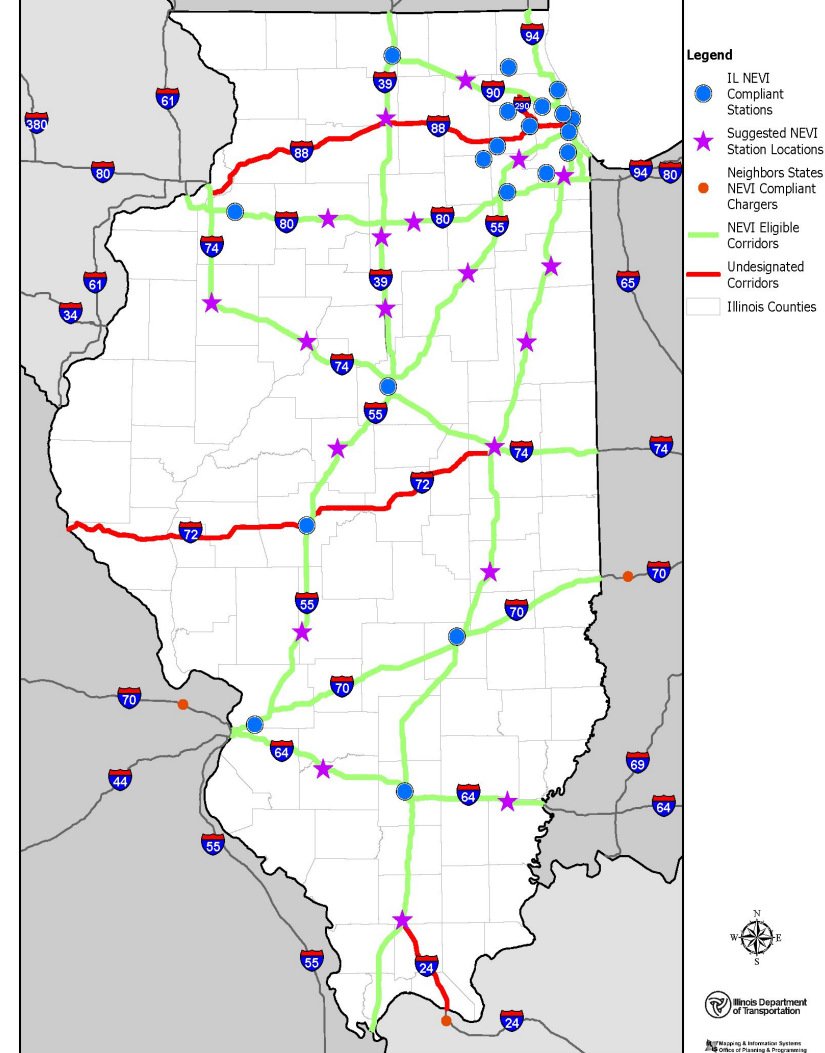
## STEWARDSHIP

Safeguard existing funding and increase revenues to support system maintenance, modernization, and strategic growth of Illinois' transportation system.

## PERFORMANCE GOALS

# Initial IDOT Analysis of Station Locations to Meet NEVI Requirements

- Locations are approximate
- To be refined and prioritized as part of contracting process



## Initial approaches to:

- Prioritizing locations for charging infrastructure
- Contracting and procurement
- Equity and compliance with Federal Justice40
- Program evaluation metrics and key performance indicators
- Ensuring a sufficient and diverse workforce
- Stakeholder engagement





## **OTHER EV ACTIVITIES IN IL**

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# Illinois Support for Purchasing an EV

- Illinois residents that purchase a new or used all-electric vehicle after July 1, 2022 will be eligible for a rebate. Low-income customers are prioritized
  - \$4,000 rebate for the purchase of an all-electric passenger vehicle
  - \$1,500 rebate for the purchase of an all-electric motorcycle
- First Round:
  - Low Income Applications Received 232
  - Low Income Rebates Awarded 158
  - Non-Low Income Applications Received 2518
  - Non-Low Income Rebates Awarded 763
- Second Round: applications are being accepted between November 1, 2022 and January 31, 2023
- <https://www2.illinois.gov/epa/topics/ceja/Pages/Electric-Vehicle-Rebates.aspx>



Illinois Environmental  
Protection Agency

# Illinois Support for Installing Public Charging

- **CEJA grants**
- \$70 m towards supporting 80% of installed cost of charging infrastructure (Level 2 and Level 3)
  - Rule draft issued late summer comment period closed October 3, 2022
  - Final Rule to be issued soon...Sign up for updates @ <https://www2.illinois.gov/epa>



Illinois Environmental  
Protection Agency

# Trucks, Buses, and More Charging Infrastructure

- IEPA also developing grants/rebates for vehicles with funds from the VW settlement
  - \$12.6 million for light-duty charging. NOFO currently available: **Deadline December 30, 2022**
  - \$27 million for all-electric public transit buses and public passenger/commuter locomotives
  - \$27 million for all-electric school buses
  - \$16 million for all-electric Class 4-8 local freight trucks (including municipal trucks, refuse trucks, dump trucks, concrete mixer trucks, delivery vehicles, and Class 8 port drayage trucks;





# **GETTING INVOLVED**

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*Illinois has emerged as a leader in embracing electric vehicles as cornerstones of economic growth and carbon reduction in our state. Under Gov. Pritzker, a foundation has been laid to remake transportation as we know it here in Illinois. We are blazing a trail by creating infrastructure to support electric vehicles as one of many means to get people where they are going, and connecting and uplifting communities along the way. We are watching new technology and new ways to travel unfolding before us. We have a lot to be excited about - as well as a lot to learn.*

- Omer Osman

Secretary of Transportation

Illinois submitted its [Electric Vehicle Deployment Plan](#) 📄 to the Joint Office of Energy and Transportation on August 1, 2022. The plan is a draft, pending review and approval from the Federal Highway Administration. As part of continued stakeholder engagement, IDOT has prepared a [summary of initial comments](#) 📄 received by stakeholders and how the feedback is influencing NEVI plan implementation. IDOT plans to continue providing periodic summaries of stakeholder and public feedback as implementation continues.

🔊 Share Your Feedback 🗨️



# Ways you can provide input

- Suggest a charging station location:  
<https://idot.click/drive-electric>
- Email:  
[DOT.DriveElectric@Illinois.gov](mailto:DOT.DriveElectric@Illinois.gov)
- Attend future meetings



## Comments

Comments can be seen by the public.

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# Questions



Tom Stephens



Elizabeth Irvin  
Chris Schmidt

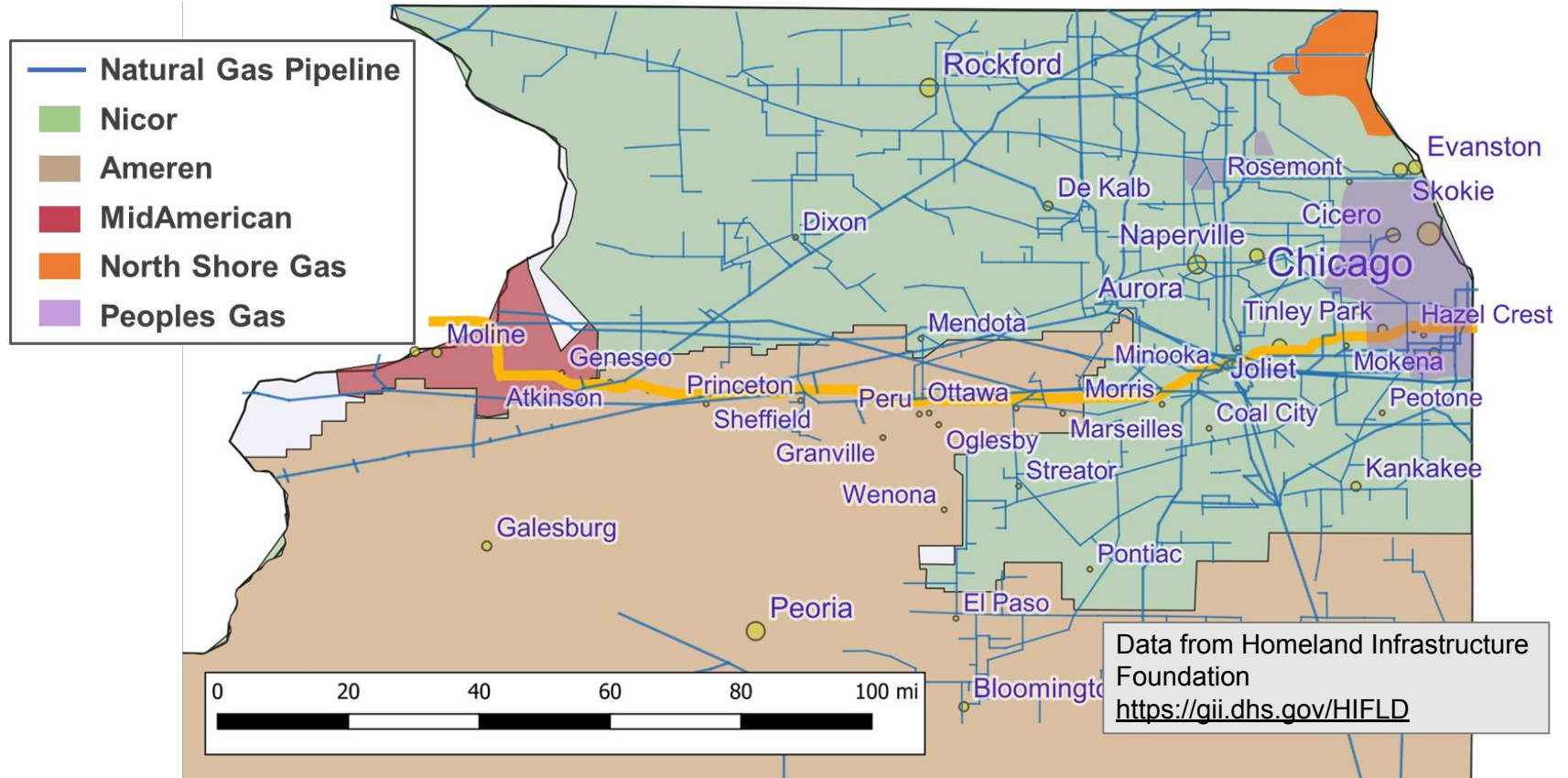


Tim Milburn

# Introduction to the Role of Utilities



# Many Natural Gas Pipelines Serve Northern Illinois







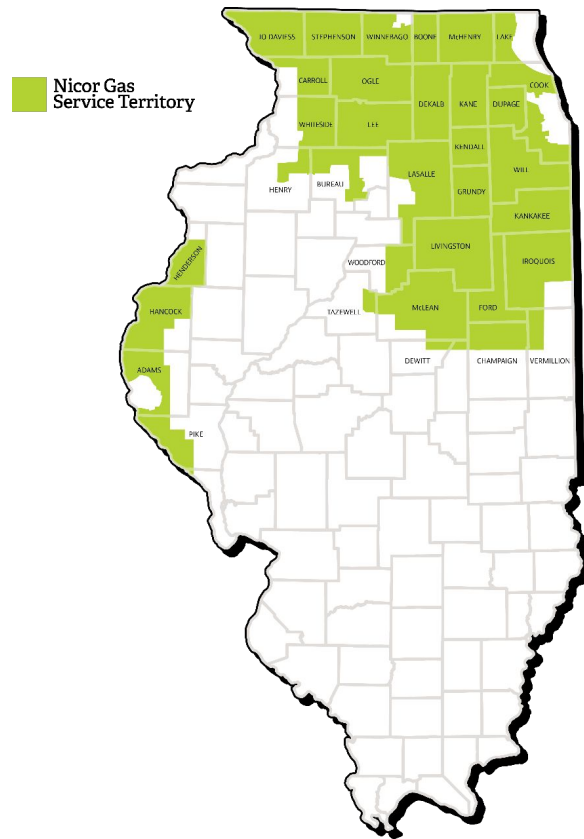
# Natural Gas Utility Considerations

Christopher Sala

Sr. Industrial & Commercial Account Executive at Nicor Gas

# Our Company

- Nicor Gas is the largest natural gas delivery company in Illinois with:
  - 2.2 million customers
  - 650+ communities
  - 17,000 square miles of territory
  - 43 facilities across the state



# Illinois Fleets with NGVs

## A Representative List

- Nicor Gas
- Ozinga
- City of Naperville / Trillium
- Waste Management
- Groot Industries
- Republic Services
- Advanced Disposal
- Forest Preserve of DuPage County
- Village of Downers Grove
- Pace Bus
- ABT Electronics
- Homewood Disposal
- Dillon Transport
- Paper Transport Inc
- City of Chicago (+ 400 taxis)
- MetroLINK (Moline/Quad Cities)
- Springfield Mass Transit District
- Gain Clean Fuel



# How to How to Serve a CNG Customer...

## Nicor Gas Serving the Market



**Natural Gas  
Supply**

**Customer  
Request/Analysis**



**Utilizing  
Existing or  
Building  
Infrastructure to  
Meet Request**



**CNG Station  
Construction  
& Maintenance  
Utility Regulated Rate  
Or Non-Regulated  
Affiliate  
Public or  
Private Access**



**Market**



# Electric Utility Considerations

—  
Tim Milburn

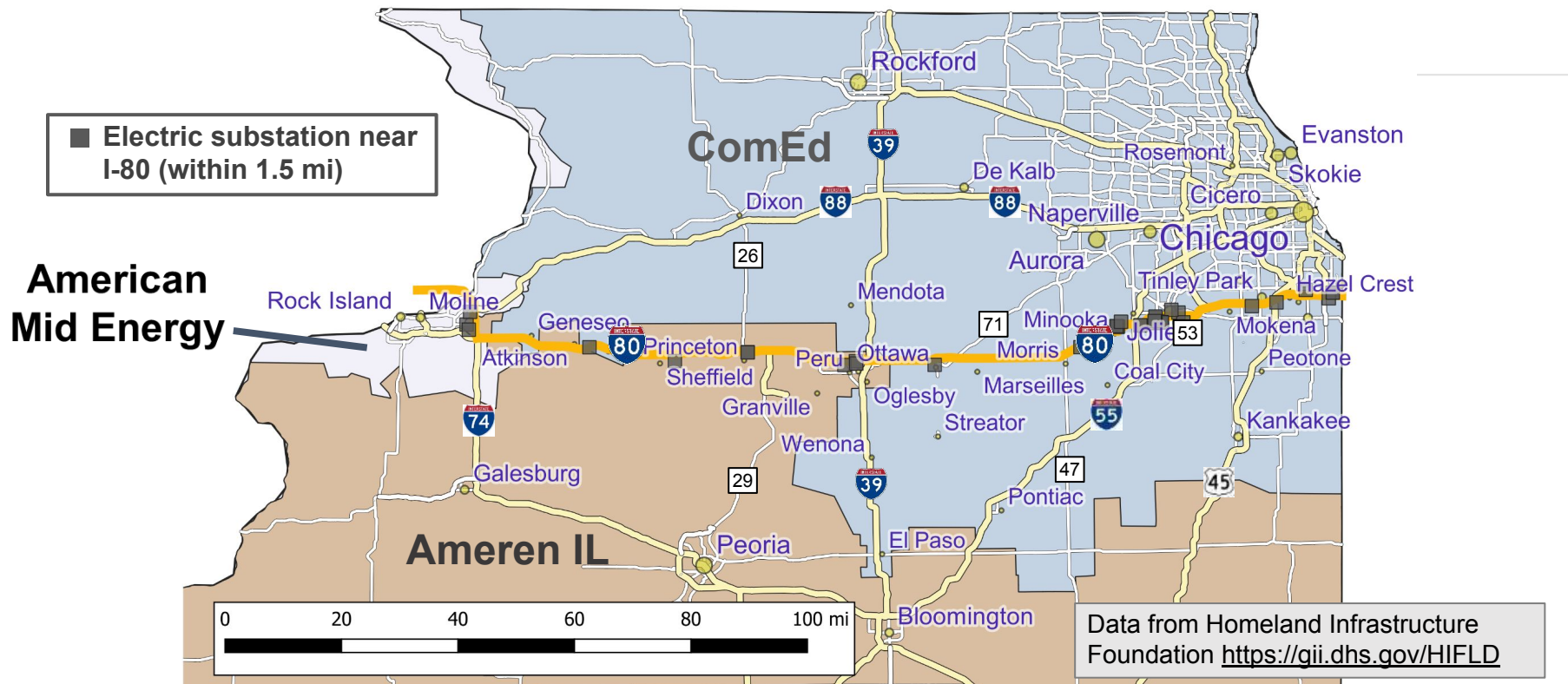
Chicago Area Clean Cities Project Consultant  
Green Ways 2Go, Partner





# Electric Utilities and Substations near I-80

I-80 goes through ComEd and Ameren Illinois service territories



# EV Charging and Utilities

- Utilities to manage EV charging behavior through rate structures.
  - Motivate charging consumption to off peak times of day
  - Create demand charge rate structures specific to EV charging to help launch the new market
- Utility programs, policies and rates regulated by state laws and agency actions.
  - Climate and Equitable Jobs Act (CEJA) has set targets for reduction in cost of power over time and emissions / GHGs (utilities > 500,000 customers)
  - Utilities submitted comprehensive plans (7/1/22) to meet targets to Illinois Commerce Commission for review and approval
  - Policies and programs to be released Jan 1, 2023
  - Program roll-outs to follow
- Utilities also responsible for educating stakeholders
- Prioritize investments equitably for communities in need.



# Beneficial Electrification Programs

- Beneficial Electrification - *requirements* per CEJA
  - Program plans: reduce upfront costs of EVs and charging equipment
    - Utilities may install/participate in make ready infrastructure - recover over time in rates
  - Specific programs for low income support for EV Charging
  - Time of Use Rates to drive user behavior
  - Prioritize deploying fast charging access (rebates) - Corridors likely included.
  - Incentives to support *integration* of EV Charging with solar, energy storage, vehicle to grid, smart tech



## ComEd BE Plan

file:///C:/Users/login/Creative%20Cloud%20Files/Downloads/567114.pdf

AMEREN ILLINOIS COMPANY  
BENEFICIAL ELECTRIFICATION PLAN

June 30, 2022

## Ameren IL BE Plan

file:///C:/Users/login/Creative%20Cloud%20Files/Downloads/567031.pdf

# Beneficial Electrification Programs

- Beneficial Electrification - *requirements* per CEJA
  - Commercial tariff options to facilitate EV Charging - reduce /cap demand charges
    - Support underutilized charging stations w/ high demand charges for relatively low consumption
  - Facilitate electrification of public transit and other vehicle fleets in the light-duty, medium-duty, and heavy-duty sectors
  - Align with Agency-issued rebates for charging equipment
  - Spending staged:
    - ComEd: \$100 MM spend- 3 years
    - Ameren \$12 MM spend - 4 years
  - Dedicated EV charging delivery customer class tariff for Commercial and Industrial (C&I) customers - may apply to Corridor charging.
  - Wait and see.....January 2023



AMEREN ILLINOIS COMPANY  
BENEFICIAL ELECTRIFICATION PLAN

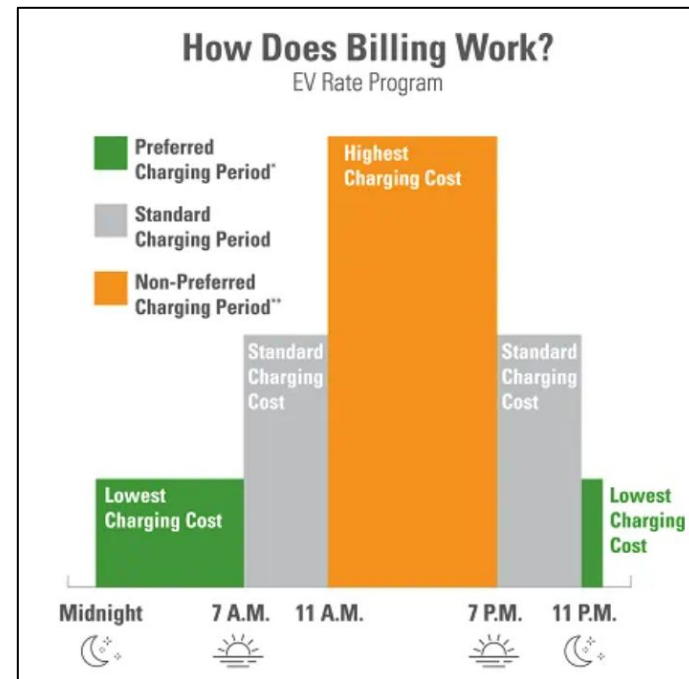
June 30, 2022

# Current Rate Programs



## Ameren Non-residential EV Rate Program

- Ameren Illinois offers a rates to encourage charge when demand for electricity is lowest. Includes
  - **Multiple Family Dwellings (MFDs)**
  - **Education and Transit Facilities**
- Same rates may be applied as part of Beneficial Electrification - TBD



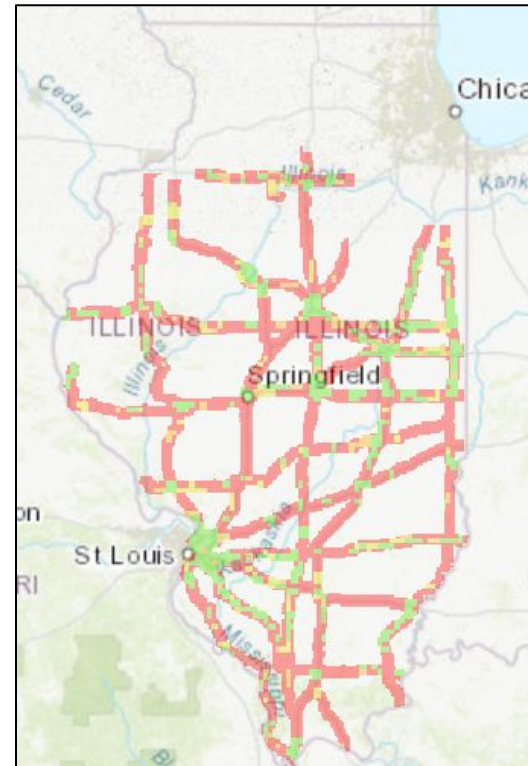


# Current Rate Programs



## Ameren Non-residential EV Rate Program

- **Corridor and Non-Corridor Charging**
  - Within Ameren service territory
  - In [predetermined areas along transportation corridors](#) - capacity based
  - on-residential customers pay a **distribution demand charge** based on the rate multiplied by the greater of the following:
    - Maximum on-peak demand
    - 50% of the off-peak demand
  - Unlimited off-peak charging without increasing delivery service charges
  - A [rate limiter credit](#) to help manage demand charges in the early stages of EV adoption.
  - Additional funding may be available through [supplemental line extensions](#) which reduce costs of installing charging equipment.
  - Same rates may be applied as part of Beneficial Electrification - TBD

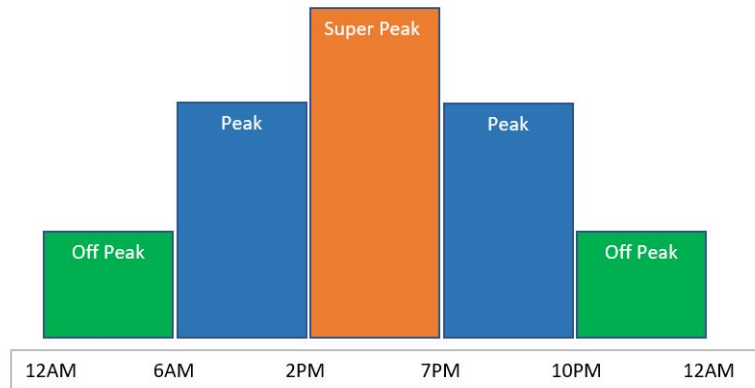


# Current Rate Programs



## ComEd Rate Options:

- Residential
  - Time-of-Day Pricing Rate -selected rate intervals
    - Off-Peak
    - Peak
    - Super Peak
  - Hourly Pricing Rate - changes hourly
  - Fixed-Price Rate (BES)
  - Delivery Services Rate (third party rates)
- Non-residential, rate structure is more complicated, and specific EV programs not yet defined.
  - Philosophy will likely be similar - on vs. off peak demand rates, plus approaches to jump start the market- demand charge programs
  - Should be included within Beneficial Electrification program



# EV Education and Support Programs

Utilities are preparing for growth in EV charging demand by providing educational programs and access to resources

## Ameren Illinois Resources

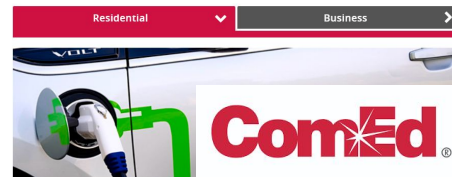
- Calculate monthly savings potential
- Calculate how much an EV saves you every mile
- Compare all-electric vehicle models
- Compare plug-in hybrid electric vehicles
- View sample Workplace Charging Policy (PDF)

## ComEd Resources

- [EV Smart](#) - multiple resources for EVs, EV Charging, finding stations, incentives
- [EV Charger Readiness](#) - step by step guidance for Charge installation
- [Metropolitan Mayors Caucus EV Readiness Program](#) - assist municipalities in safe and effective EV charging deployment



### EV Charger Readiness



# Utility Perspectives

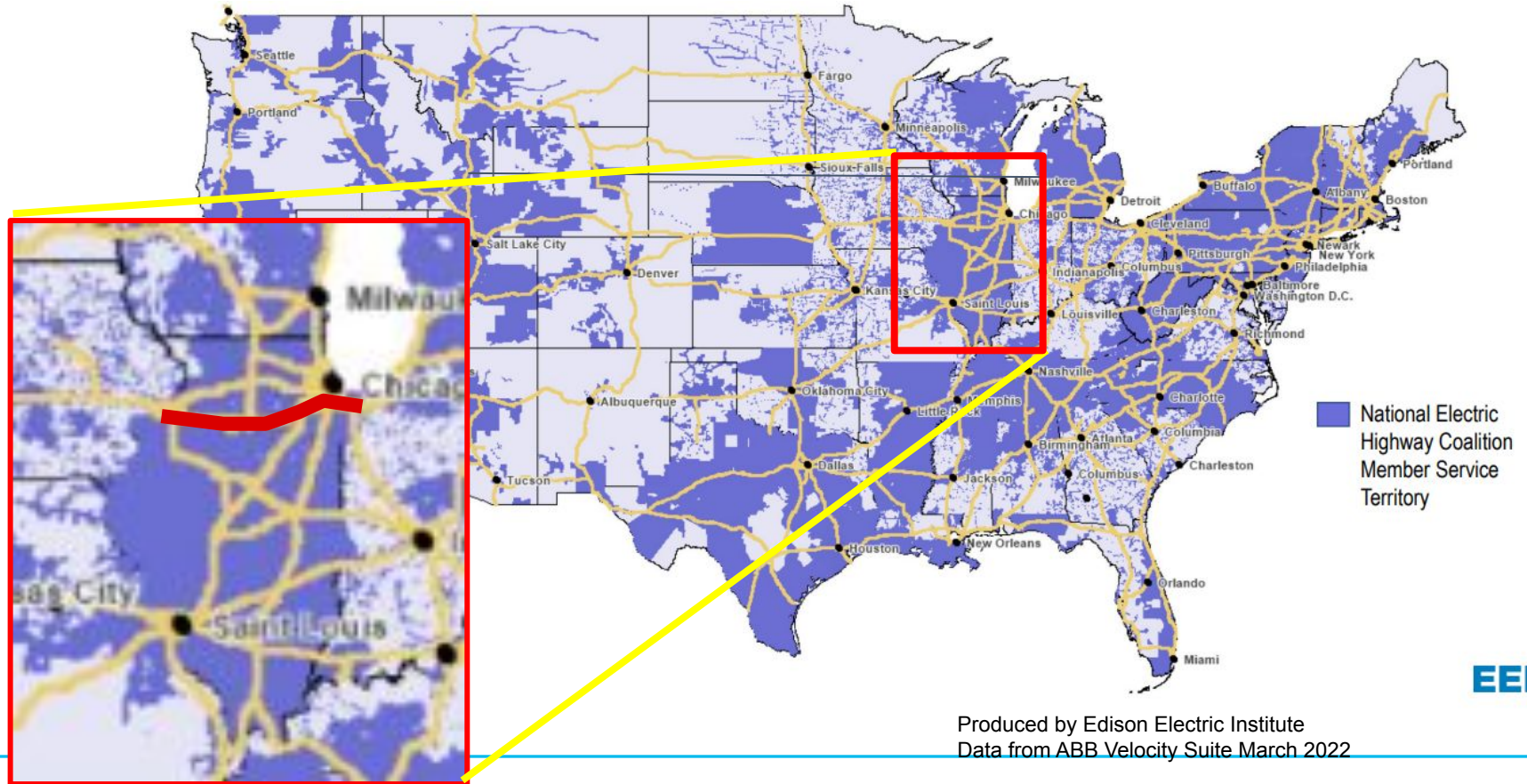
- Contact the utilities ***early in your planning***
- Make sure you consider gas & electric supplies for any properties
  - Develop initial utility consumption and peak demand estimates
  - Property within reasonable distances
    - At peak demand capacities (gas pressure, distribution power)
  - Understand utility make ready needs and costs
  - Find out what the utility can do for you
  - Understand rate structures for your business plans
  - Consider future demand

# National Electric Highway Coalition

- Collaboration among electric companies: provide EV fast charging stations
- Remove corridor range anxiety by the end of 2023.
- Ensure transition to EVs is seamless for drivers.
- **More than 60** investor-owned and municipal electric companies and electric cooperatives
  - Serving more than 120 million U.S. electric customers across 48 states and the District of Columbia.
  - Member companies have invested more than \$3.7 billion in customer programs and projects
- Estimates: **140,000 EV fast charging ports**, (> 10X increase)  
For ~27 million EVs projected by **2030**.



# National Electric Highway Coalition



# Questions



ComEd®



Nicor Gas



Green Ways 2Go



**Ameren**

Chris Sala

Tim Milburn



# Break



10:00



# Investments and Resources





# Alt Fuel Vehicle Investments

—

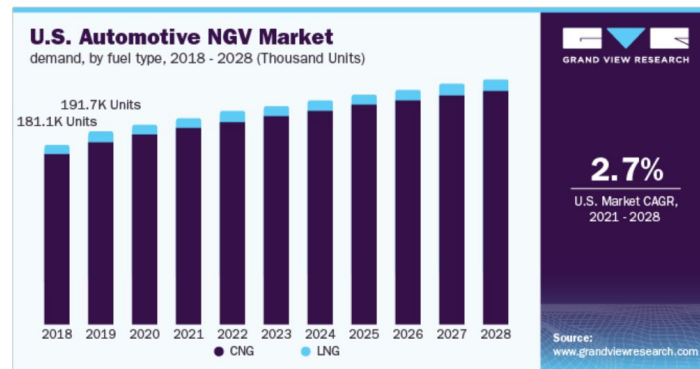
Tim Milburn

Chicago Area Clean Cities Project Consultant  
Green Ways 2Go, Partner



# Natural Gas Vehicles (NGVs) Demand

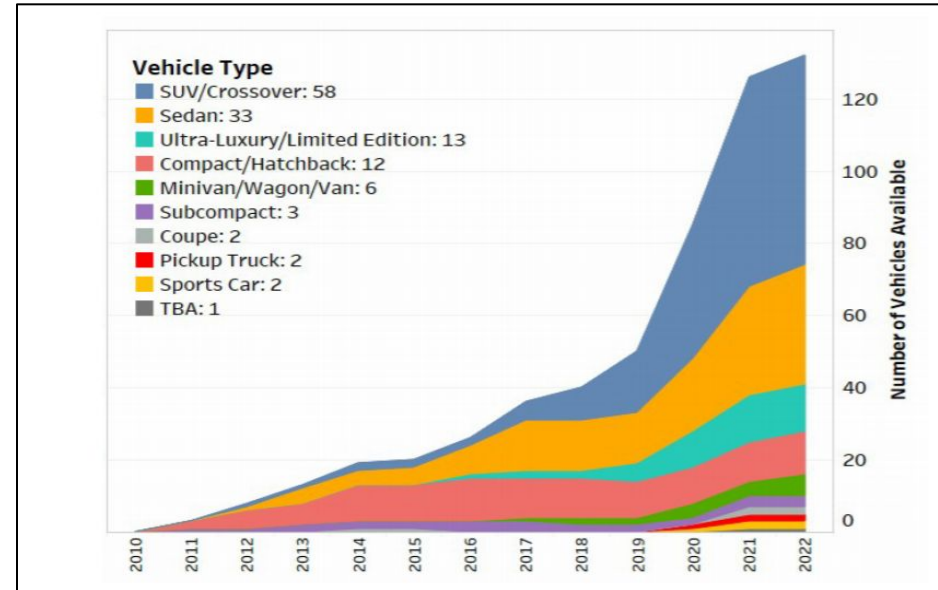
- Medium- and heavy-duty NGVs widely available
- Using RNG supports climate goals for fleets, revitalizing use of Nat Gas
- Per NGV America, in 2021, 64% of GGEs consumed in on road apps were RNG
- Demand continues for NGVs (Grand View Research - 2.7 % growth)



# Passenger Electric Vehicle Demand and Availability

- Demand growth - policy and sustainability driven
- 5% of new vehicle sales are EVs: 2022
- Many more models coming – all vehicle types
- Rivian with 500-mile range: 2022
- GM:
  - 30 models by 2025
  - End production of gas and diesel by 2035
- Ford: \$22 billion in EV investment through 2025
- Toyota: 40% of US sales to be EV by 2025
- 2022: supply chain challenges - seem to be abating

EPRI [Consumer Guide to Electric Vehicles](#)



Plugstar.com

# AFDC\* Advanced Vehicle Search

<https://afdc.energy.gov/vehicles/search/>

**Alternative Fuel and Advanced Vehicle Search**  
Find and compare alternative fuel vehicles, engines, and hybrid/conversion systems. Some of the light-duty vehicles may count toward vehicle-acquisition requirements for federal fleets or state and alternative fuel provider fleets regulated by the Energy Policy Act. For downloads of past model years, see the publications search.

**Vehicles by Type**

- Sedan/Wagon
- Pickup
- SUV
- Van
- Step Van
- Vocational/Cab Chassis
- Street Sweeper
- Refuse
- Tractor
- Passenger Van/Shuttle Bus
- Transit Bus
- School Bus

**Vehicles by Manufacturer**

Light-Duty  
All [SEARCH]

Medium- and Heavy-Duty  
All [SEARCH]

**Engines and Hybrid/Conversion**  
For medium- and heavy-duty vehicles:

ENGINE & POWER SOURCES [CONVERSION SYSTEMS]

**Pick Engine Fuel/Technology**

- ☐ All
- ☐ Biodiesel (B20)
- ☐ Ethanol (E85)
- ☐ Hydrogen Fuel Cell
- ☐ LNG - Liquefied Natural Gas
- ☐ CNG - Compressed Natural Gas
- ☐ Propane
- ☒ Electric
- ☒ Plug-in Hybrid Electric
- ☐ Hybrid Electric
- ☐ Hydraulic Hybrid
- ☐ Diesel/Hybrid Electric
- ☐ Natural Gas

[SEARCH]

**Search Results - 1 - 8 of 98 vehicles**

Filter by: Model Year: 2023, 2022 Fuel/Technology: Electric, Plug-in Hybrid Electric | Class/Type: Sedan/Wagon | Manufacturer: All | View: [Grid Icon] [List Icon]

**Audi e-tron GT/RS e-tron GT (2023)**  
Electric sedan/wagon  
5 seats  
\$102,400 base MSRP

Alternative Fuel Economy (Combined): 81-82 MPGe  
Electric-Only Range: 232-238 miles  
Charging Rate:  
Level 2: 9.6 kW | DC Fast: 270 kW  
Charging Speed (per hour of charging):  
Level 1: 3 miles | Level 2: 23 miles | DC Fast: 262 miles  
Battery Capacity: 95 kWh  
Engine/Motor(s): TBD  
Transmission: Auto  
Drivetrain: AWD  
[Find a Dealer](#)

**BMW i4 eDrive40 Gran Coupe (18" Wheels) (2023)**  
Electric sedan/wagon  
5 seats  
\$55,394 base MSRP

Alternative Fuel Economy (Combined): 109 MPGe  
Electric-Only Range: 301 miles  
Battery Capacity: 84 kWh  
Engine/Motor(s): TBD  
Transmission: Auto  
Drivetrain: RWD  
[Find a Dealer](#)

**BMW i4 M50 Gran Coupe (2023)**  
Electric sedan/wagon  
5 seats  
\$97,300 base MSRP

Alternative Fuel Economy (Combined): 80-96 MPGe  
Electric-Only Range: 227-271 miles  
Charging Rate:  
Level 2: 11 kW | DC Fast: 196 kW  
Charging Speed (per hour of charging):  
Level 1: 4 miles | Level 2: 33 miles | DC Fast: 483 miles  
Battery Capacity: 83 kWh  
Engine/Motor(s): TBD  
Transmission: Auto  
Drivetrain: AWD  
[Find a Dealer](#)

**BMW i7 xDrive60 Sedan (2023)**  
Electric sedan/wagon  
5 seats

Alternative Fuel Economy (Combined): 83-89 MPGe  
Electric-Only Range: 290-318 miles  
Battery Capacity: 105 kWh  
Engine/Motor(s): TBD  
Transmission: Auto  
Drivetrain: AWD  
[Find a Dealer](#)


**Already: as of 2022/2023**

- 98 sedan/wagon
- 73 SUVs
- 6 Vans

\*AFDC = US DOE's Alternative Fuel Data Center

# AFDC Advanced Vehicle Search


<https://afdc.energy.gov/vehicles/search/>





## Alternative Fuel and Advanced Vehicle Search


Find and compare alternative fuel vehicles, engines, and hybrid/conversion systems. Some of the light-duty vehicles may count toward vehicle-acquisition requirements for [federal fleets](#) or [state and alternative fuel provider fleets](#) regulated by the Energy Policy Act. For downloads of past model years, see the [publications search](#).


### Vehicles by Type


 Sedan/Wagon


 Pickup


 SUV


 Van


 Step Van


 Vocational/Cab Chassis


 Street Sweeper

 Refuse

 **Tractor**

 Passenger Van/Shuttle Bus

 Transit Bus

 School Bus

### Vehicles by Manufacturer

Light-Duty

All

SEARCH

Medium and Heavy-Duty

All

SEARCH

### Engines and Hybrid/Conversion

For medium- and heavy-duty vehicles:

ENGINE & POWER SOURCES

CONVERSION

### Pick Engine Fuel/Technology

- ☐ All
- ☐ Biodiesel (B20)
- ☐ Ethanol (E85)
- ☐ Hydrogen Fuel Cell
- ☐ LNG - Liquefied Natural Gas
- ☐ CNG - Compressed Natural Gas
- ☐ Propane
- ☒ Electric
- ☒ Plug-in Hybrid Electric
- ☐ Hybrid Electric
- ☐ Hydraulic Hybrid
- ☐ Diesel/Hybrid Electric
- ☐ Natural Gas

SEARCH


## Already as of 2022/2023


- 5 Pickups
- 5 Step Vans
- 9 Tractors
- 19 Vans & Shuttle Buses
- 35 Transit Buses
- 15 School Buses


Search Results - 1 - 8 of 8 vehicles


Filter by: Model Year: 2023, 2022, 2021 Fuel Technology: Electric | Class/Type: Tractor | Manufacturer: All


View: 888


**Autocar ACTT Terminal Tractor**  
Electric  
  
Transmission: Vorza Automatic  
Power Source(s):  
Note: According to manufacturer: 150kW electric motor; up to 210kWh battery; up to 22 hours run time


**BYD 8TT Day Cab**  
Electric  
  
Transmission: BYD Automatic  
Note: According to manufacturer: 105,000 lbs GCWR; 483 HP; 1,770 lb-ft torque


**BYD 8Y Terminal Tractor**  
Electric  
  
Transmission: BYD  
Note: According to manufacturer: 102,000 lbs GCWR; 241 HP; 1,106 lb-ft torque

**Kalmor Ottawa T2E+**  
Electric  
  
Power Source(s):  
Cummins 170-kW Electric Drive Motor  
Note: According to manufacturer: available with charging capacities of 24kWh-100kWh; 152 kWh or 184 kWh battery storage

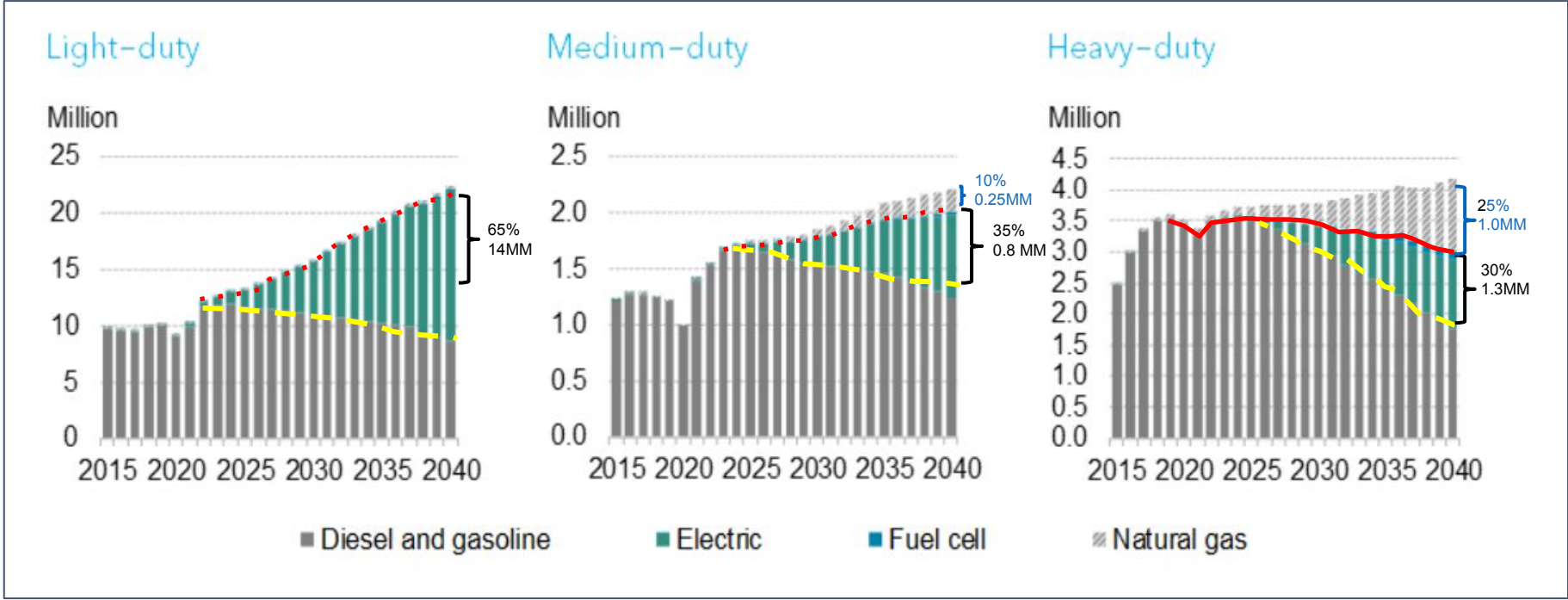
**Kenworth T680E**  
Electric  
  
Power Source(s):  
Mentor 14Xe e-axes  
Note: According to manufacturer: Available in 54,000 lb. and 82,000 lb GVWR; 396 kWh battery for 150 miles range; DC Fast Charging via J1772 CCS with 120 kW maximum rate and 3.3-hr charge time

**Lion Electric LIONBT - Class 8**  
Electric  
  
Transmission: Automatic  
Power Source(s):  
Mentor 2-Speed e-axis  
Note: According to manufacturer: Class 8, 82,000 GVWR; up to 853 kWh battery and 260 miles range

**Orange EV T Series terminal**  
Electric  
  
Note: According to manufacturer: On or off road; 81,000 GCWR; regenerative braking; up to 25mph and 24 hrs tow charge; off- and on-board charging

**Peterbilt 579EV - Class 8**  
Electric  
  
Transmission: Automatic  
Power Source(s):  
Mentor 14Xe e-axes  
Note: According to manufacturer: Mentor 14Xe e-axes available in 400kW (530hp) continuous power/rating with

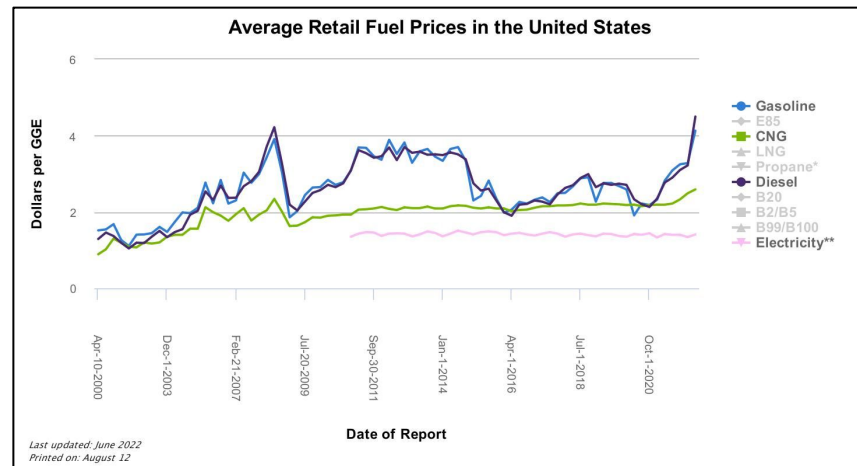
# Global e-Truck Forecast: *Bloomberg NEF, 2021*





# Demand for NGVs for CNG

- Performance equivalent to gasoline and diesel
- Dual-fuel, bi-fuel and dedicated solutions to meet applications
- Provides fuel security - domestic production
- Pipeline system in place
- Price **not** tied to oil indices
  - NG cost has averaged 27% less per GGE since 2000 and 24% less since 2012
  - Price controlled by Public Utilities
- RNG on the rise in response to environmental concerns



AFDC Site Fuel Prices

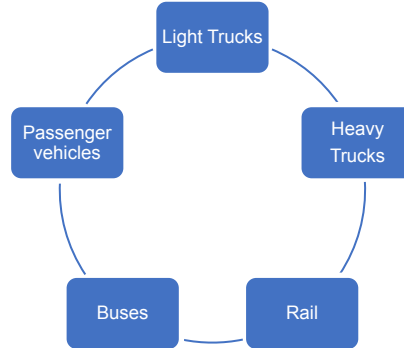
<https://afdc.energy.gov/fuels/prices.html>

# CNG Transportation User Segments

## AFDC Advanced Vehicle Search

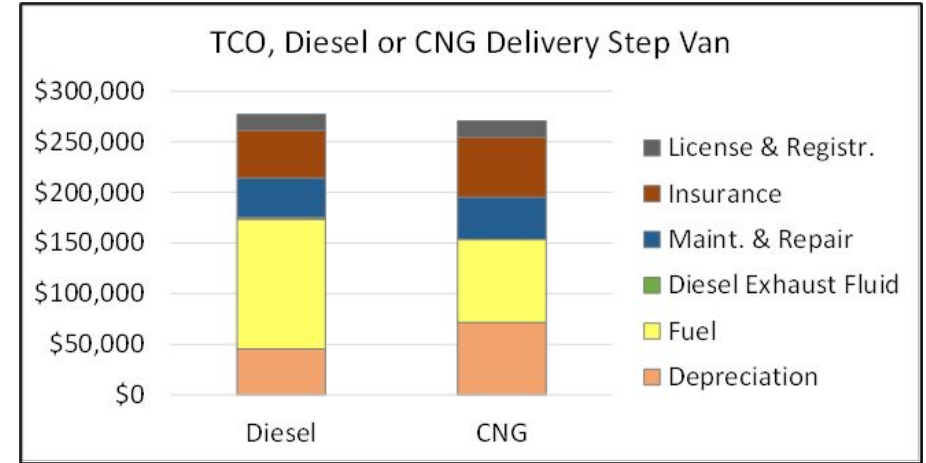
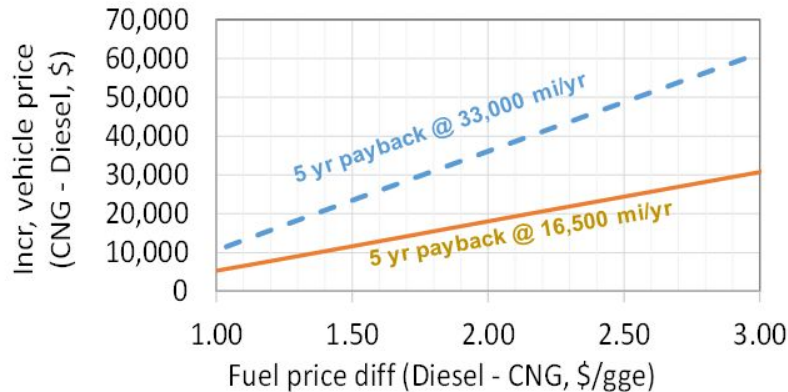
<https://afdc.energy.gov/vehicles/search/>

- 0 passenger vehicles
- 3 Pickups
- 9 Tractors
- 14 Refuse
- 28 Cab Chassis
- 4 Vans & Shuttle buses
- 24 Transit buses
- 3 School buses



# CNG Vehicles Can be Affordable to Own

- CNG delivery step van: can cost less to own than a comparable diesel van – **without incentives**
- CNG adds \$7,000 to \$60,000 - size dependent
- If vehicle incentives are available, affordability improves



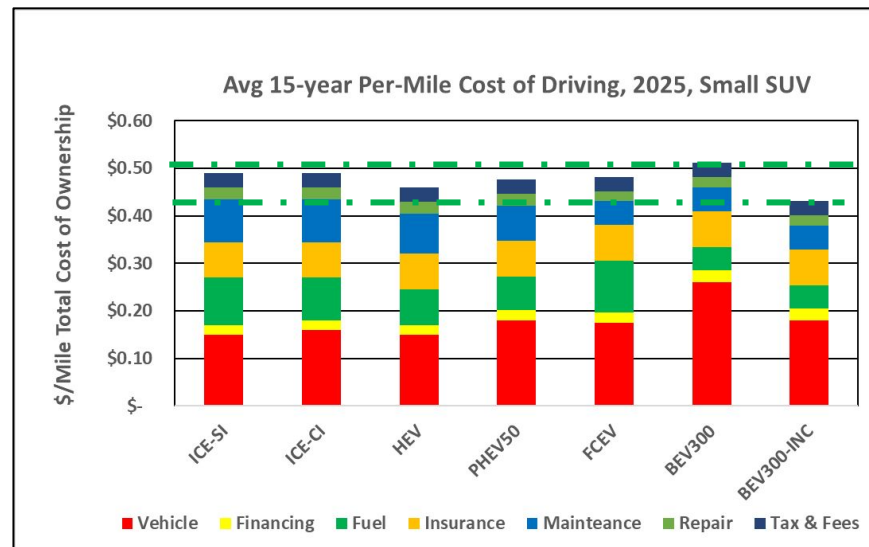
Payback time for a CNG vehicle depends on

- Relative prices of fuels
- Price of vehicles and amount of applicable incentives
- Annual mileage

# Electric Vehicles - Affordable to Own: Today

BEVs compete with comparable gasoline vehicles: ***Total Cost of Ownership***

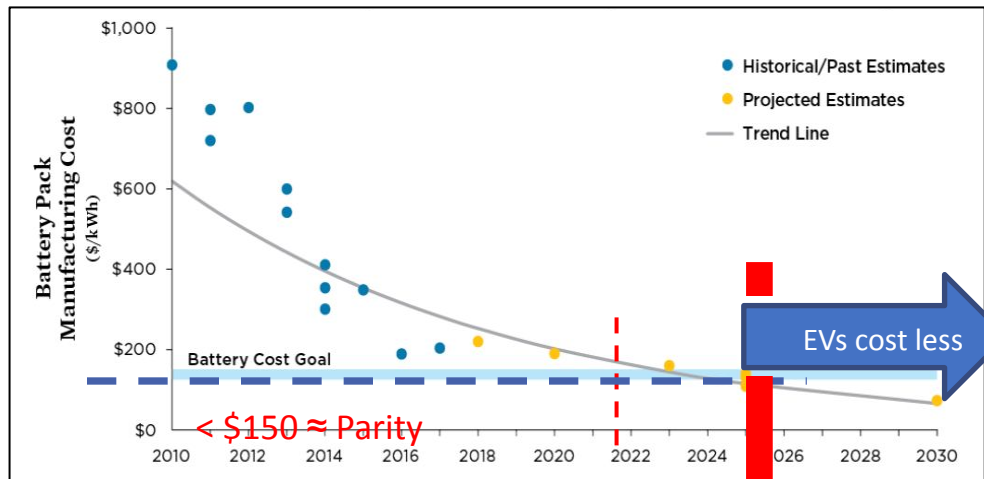
- EV demand growing, while vehicle prices remain higher than gasoline counterparts
- Tax credits and rebates are available for EVs
- Running costs (electricity, maintenance) are much less for EVs
- Medium and heavy-duty vehicles still not competitive on Total Life Cycle Cost, but ROIs may work with incentives
- Supply chain issues causing delays



# Achieving Cost Parity: Game Changer

## Reducing battery costs is key

- Battery Costs dropped 3.5:1 since 2010
  - Estimate: when EV battery costs drop below \$100-150/kWh storage
- **Passenger** \$ EV = \$ Gasoline Vehicle between 2024 and 2026 = **Cost Parity**



### SOURCES:

[Union of Concerned Scientist, 2017. "Accelerating US Leadership in Electric Vehicles"](#)

[US Department of Energy. "Batteries"](#)

[McKinsey Report/ Sept. 2021, "The Turning Point for US Auto Dealers: The Unstoppable Electric Car": "](#)



# Economics of Alternative Fuel Infrastructure Investments

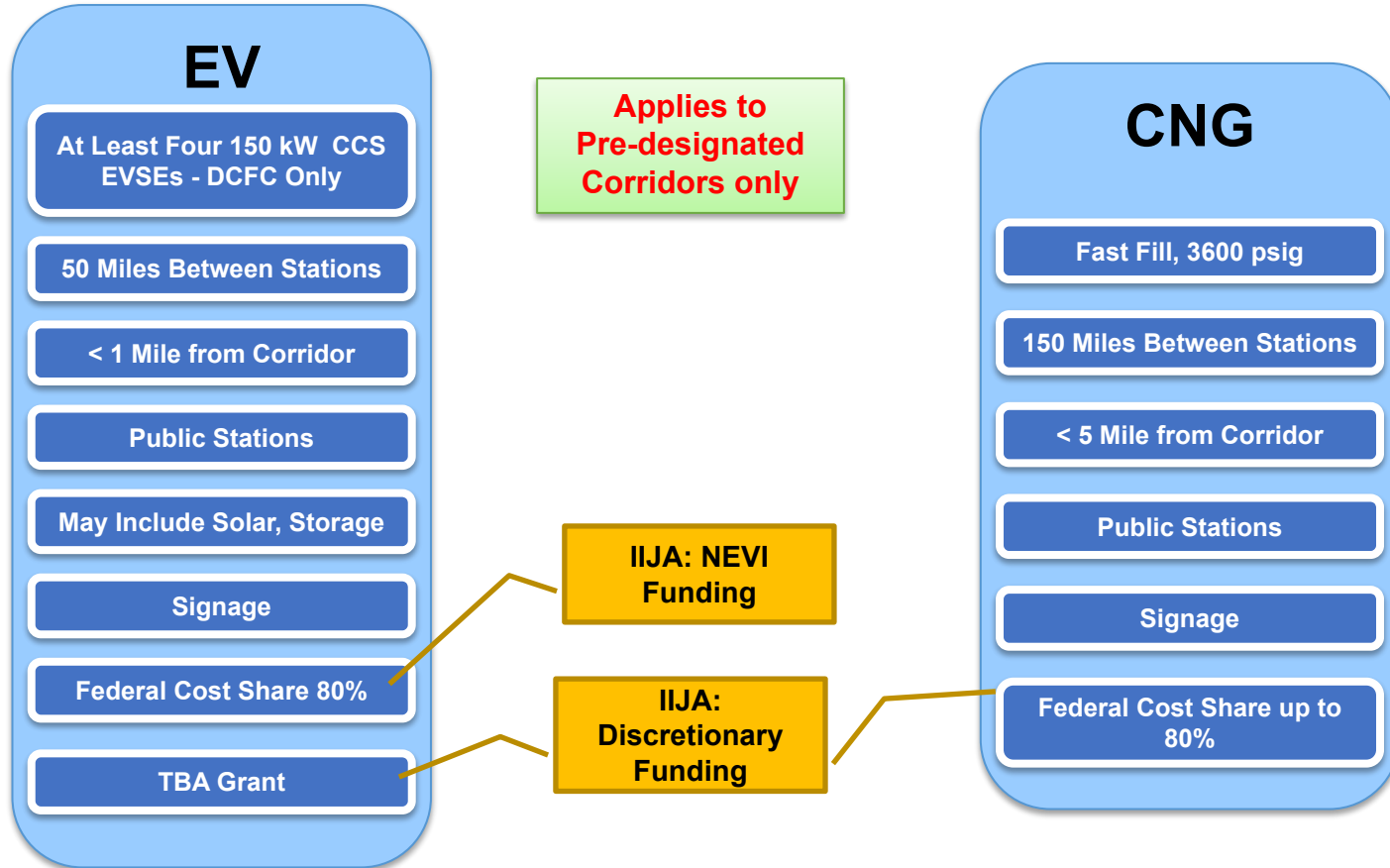


Tim Milburn

Chicago Area Clean Cities Project Consultant  
Green Ways 2Go, Partner



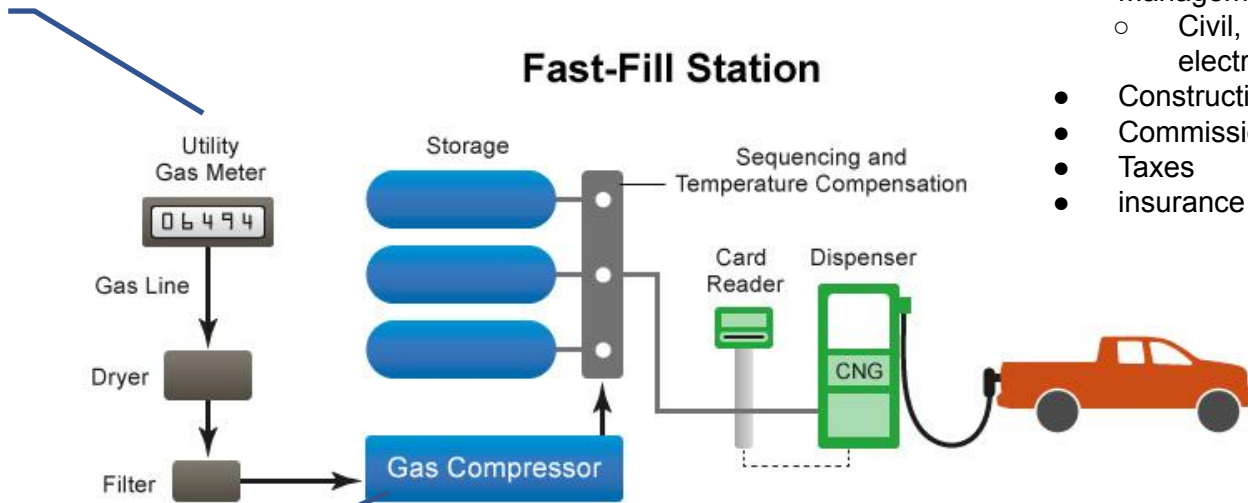
# FHWA Alternative Fuels Corridor Readiness Criteria and Funding Sources



# CNG Refueling Capital Investments

Natural Gas supply  
connections/  
upgrades

Electrical utility  
service and /or facility  
upgrade

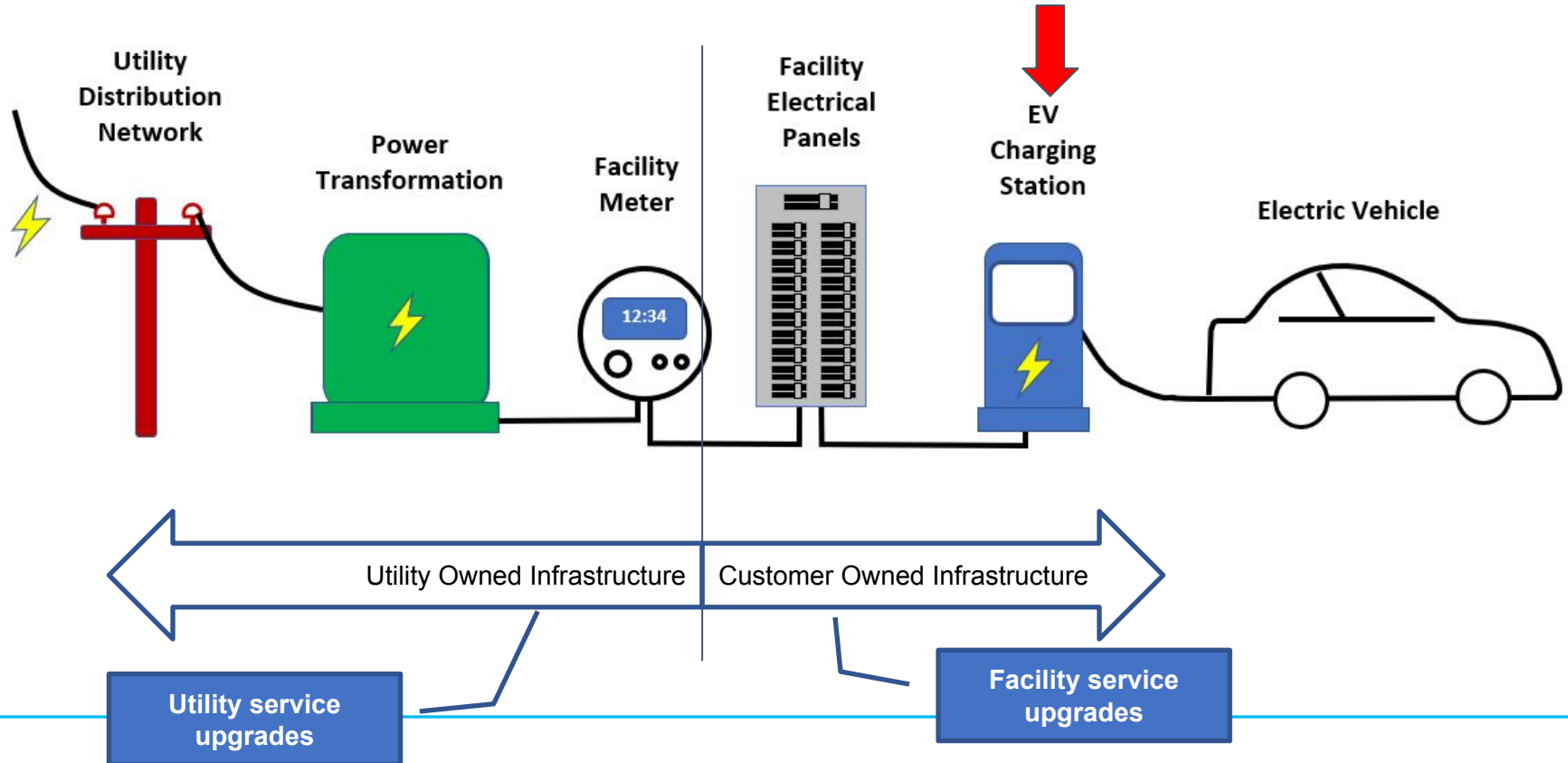


## Other Costs

- Site assessments
- Site prep
- Permits
- Design & Project Management
  - Civil, mechanical, electrical
- Construction
- Commissioning
- Taxes
- Insurance

# EV Charging Capital Investments

NEVI: 4x @150 kW



# What are Make Ready Costs Involved in EV Charging and CNG?

## EV and CNG

### Utility Side of the Electric Meter

- Power step-down transformers
- Switchgear
- Service lines (above or below ground)
- Interconnecting conduit and wiring
- Electrical/Mechanical / Civil work

### Customer Side of the Electric Meter

- Connecting conduits and wiring
- Branch Runs
- Power panels and circuit breakers
- Switchgear/ disconnects
- Transformers
- Electrical / Mechanical / Civil work

## CNG Only

### Utility Side of the Gas Meter

- Gas pressure regulators
- Service lines (above or below ground)
- Interconnecting piping
- Mechanical / Civil work

### Customer Side of the Gas Meter

- Gas dryer
- Compressors
- Storage
- Dispensing
- Controls
- Electrical / Mechanical / Civil work

***Utility Side: Who pays for what? What is included in incentives? Varies by region / utility / project***

***Electrical Supply and Gas Supply upgrades range from \$0 to \$1 MM!***

***Contact your utility early!!***

# Use Case: Corridor **Refueling** or **Recharging**

## Requirements:

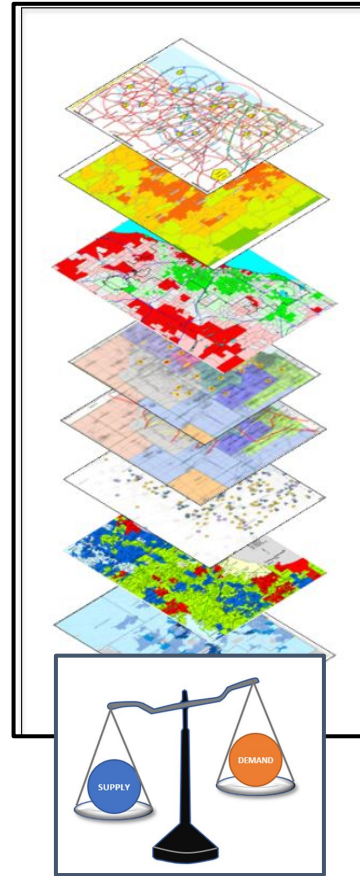
- Property and physical space
- Total Cost of Ownership must meet business goals
  - Operating and capital incentives are key
- Utility supply capacity at peak demand
- Engagement with regulators and utilities essential
- Local collaboration
- Interstate locations with full exchanges and crossroads with good traffic flow
- Supporting regional demographics and population
- Predictable demand
  - **CNG**: Long term volume contracts
  - **EVs**: Predicted EV Growth, Growing Utilization

## Key Success Criteria:

- Easy to see from interstate. Signage helps.
- Driver amenities / parking
- Multiple ports (redundancy)
- Positive aesthetics and safety
- Things to do while charging
- Sufficient population and traffic flow
- Understand competitive environment
- Equity considerations

## Future Considerations:

- Property, gas supply and power to grow
- Anticipate expansion - install higher utility capacity at onset
- Plan for larger vehicles
- Renewable energy and energy storage may help offset grid capacity costs, demand charges
- Monetization of vehicle emissions



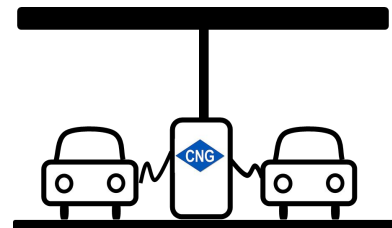


# Targets: **Corridor Refueling** or **Recharging**



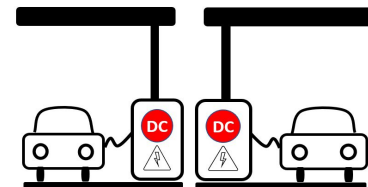
## CNG Targets:

- **CNG Refueling Stations** – 500 to 1,000 SCFM, 2 to 4 dispensers
- **Users:** Interstate drivers, local drivers
- **NGVs:** commercial and municipal fleets  
Anchor fleets to secure investment
- **Investment:** \$2 to \$3 million investments (*pre-incentive*)



## EV Targets:

- **EV Charging Stations:** DCFC (Four @150 kW, CCS connectors)
- **Users:** Interstate drivers, local drivers
  - Initially, fleets likely will rely on home-based charging - for control/ risk mgmt
  - As EV fleet numbers and use cases grow and ubiquity is established, commercial charging demand will happen at corridor sites
- **EVs:** Passenger BEVs, increasing number and type of larger EVs over time
- **Investment:** \$700,000 to \$1.1 million investments (*pre-incentive*)



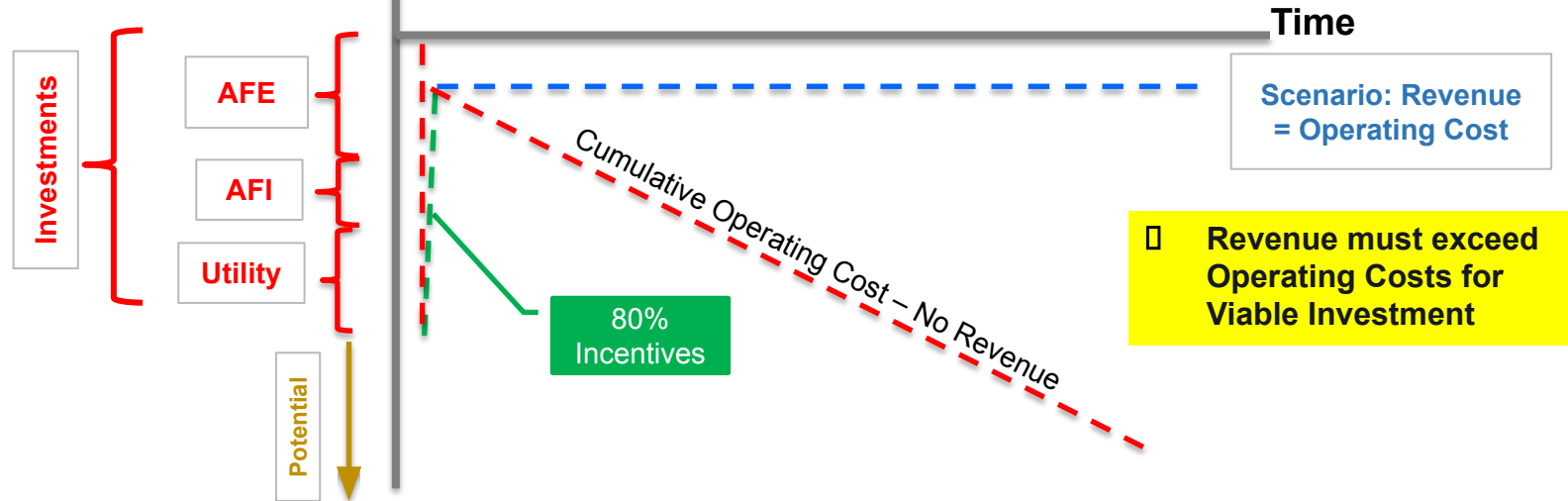
# Cumulative Cash Flow for Alternative Fuel Infrastructure Investments

**AFE** = Alternative Fuel  
Equipment

**AFI** = Alternative Infrastructure

**UI** = Utility Infrastructure

\$



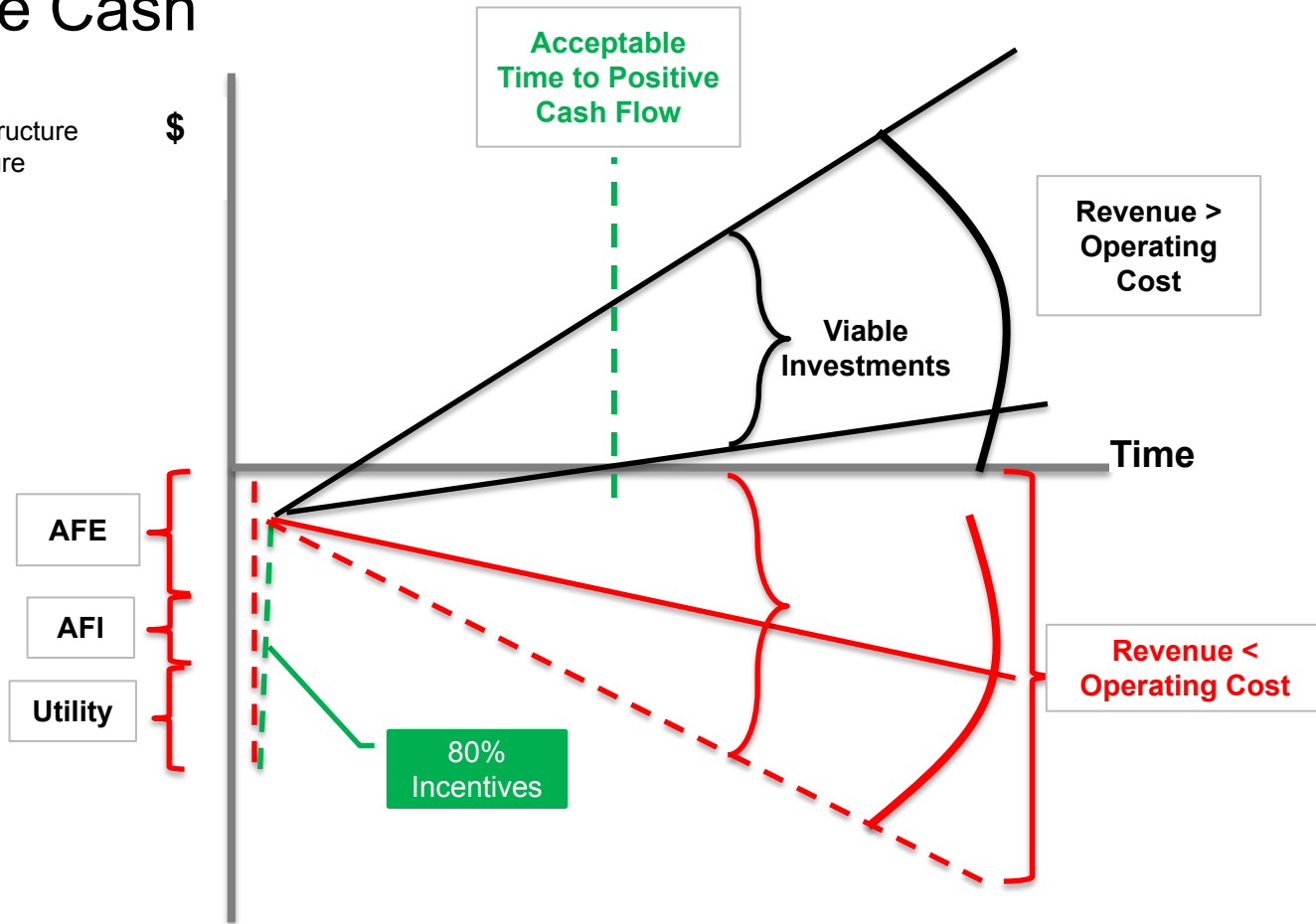
# Cumulative Cash

**AFE** = Alternative Fuel  
Equipment

**AFI** = Alternative Infrastructure

**UI** = Utility Infrastructure

\$



# Net Present Value Cash Flow Analysis Retail CNG Station\*



## Key Assumptions:

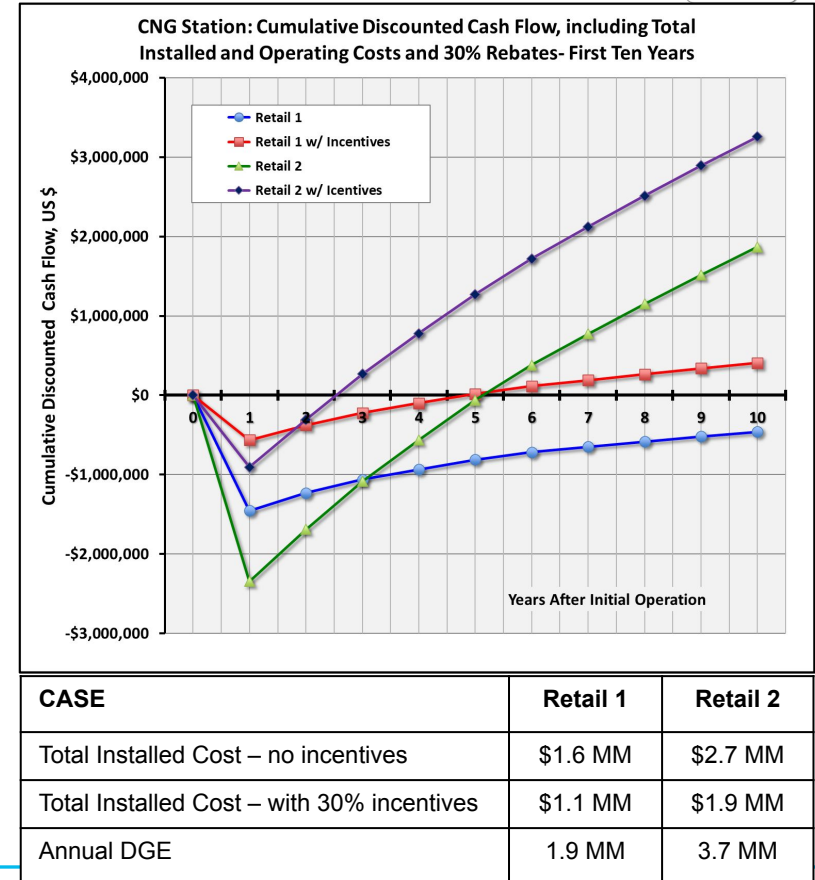
- 24/7 operation
- CNG Cost \$2.00 /DGE
- 30% gross margin on fuel

## Cases:

- **Retail 1- small retail station**
  - w/o incentives
  - w/ incentives
- **Retail 2- larger retail station**
  - w/o incentives
  - w/ incentives

## Key Drivers of Success: Utilization

- Amount of fuel pumped/day
- Amount of energy transferred per event



\*Values are for illustrative purposes only

# Net Present Value Cash Flow Analysis Retail EV Charging Station\*



## Key Assumptions

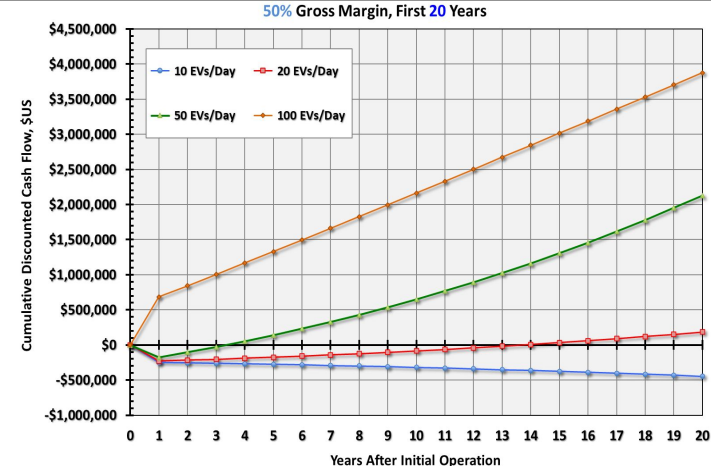
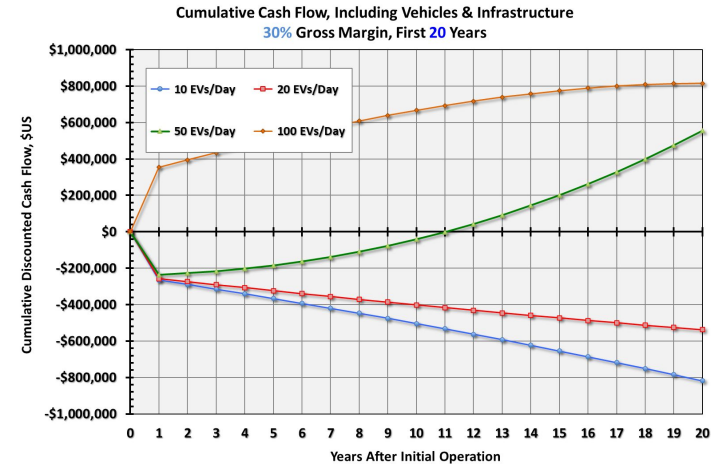
- 24/7 operation
- Four 150 kW EVSEs available
- Average recharge: 200 miles 30-minute session
- Electricity \$0.13 /kWh, demand charges
- Total installed Cost (TIC) \$1,010,000
- 80% Grant for TIC
- 30 to 50% gross margin on fuel

## Cases:

- Vary the average number of EVs per day
- Vary the margin

## Key Driver of Success: Utilization

- Number of EV charging events per day
- Amount of energy transferred per event
- Growth in EV market acceptance



\*Values are for illustrative purposes only

## CNG Refueling

- Designed / installed alternative fuels at over 200 locations.
- Stations built to provide up time → redundancy is essential.
- Some of the stations supported by local and federal incentives.
- Gaining fleet fueling contracts key to success.



## EV Charging

- Designed / installed several EV charging stations at several locations.
- Most are fast chargers.
- Many of the chargers were supported by local and federal incentives.  
→ Key to investments





# Retail Experience



## CNG Refueling

- Designed / installed compressed natural gas refueling at 7 locations.
- CNG stations built to provide up time, meaning redundancy is essential
- Some of the stations were supported by local and federal incentives.
- Focus on supporting Ozinga business and offering retail CNG sales.



## EV Charging

- Designed / installed EV charging stations at several locations.
- Two DC – Fast Chargers (pictured) and dozens of Level 2 Chargers for their own sites and local municipalities.
- Chargers supported by local and federal incentives.
- → Key to investments





# Planning for Medium and Heavy Duty Vehicles

—  
Tim Milburn

Chicago Area Clean Cities Project Consultant  
Green Ways 2Go, Partner



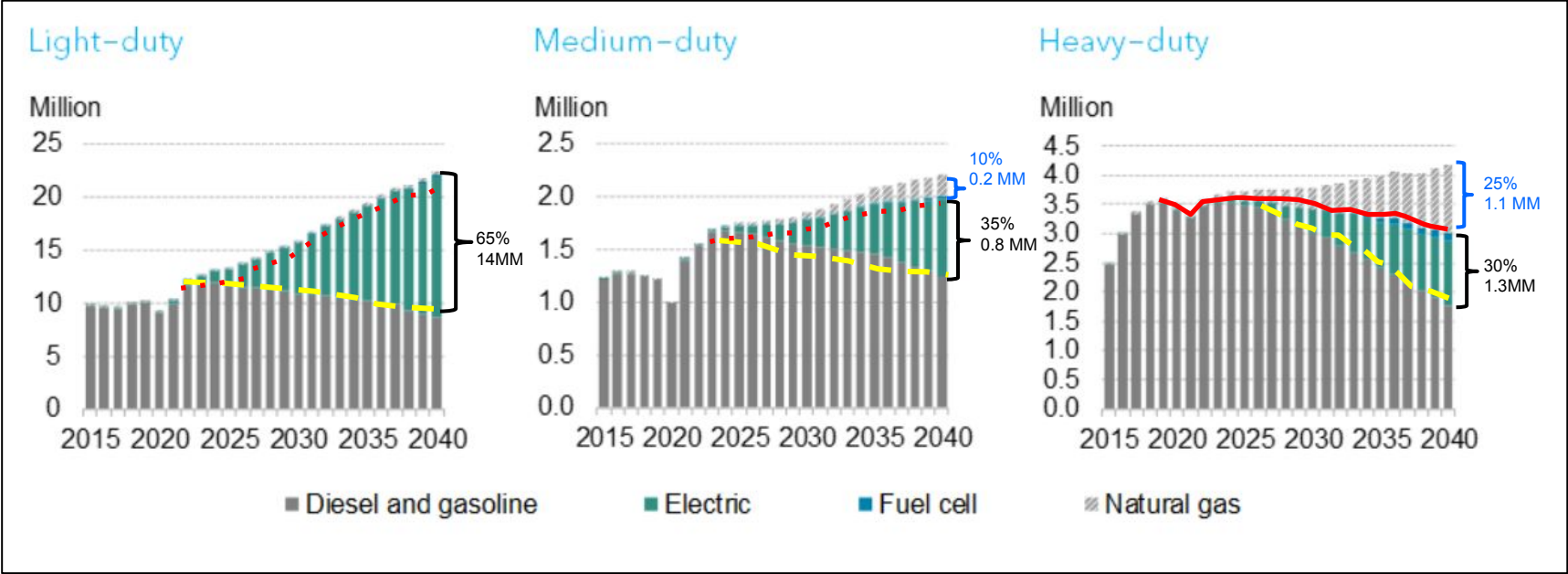
# Natural Gas Vehicles (NGVs) Demand Continues

- Using RNG supports climate goals for fleets, revitalizing use of Nat Gas
- Per NGV America, in 2021, 64% of GGEs consumed in on road apps were RNG
- Range of NGV incentives may be available
- Incentives for NGV refueling stations
- Demand continues for NGVs



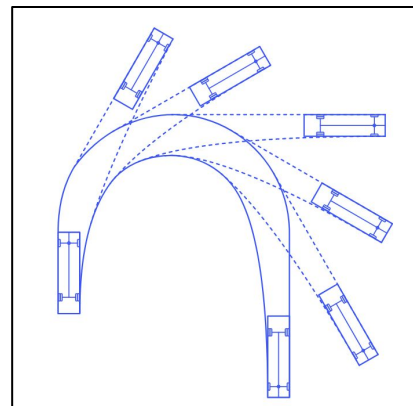
# Global Truck Forecast

Bloomberg NEF, 2021



# MD/HD NGV Corridor Refueling Considerations

- Time fill only, fast rates
- Pipelines in place, but need sufficient line pressure for faster fueling rates at peak demand
- NGV fleets need to consider on board storage vs. range
- Station investors need sufficient utilization & refueling commitments to support investments
- Site design must consider physical space - size of trucks,  
truck queueing, turning radii, access/egress
  - Similar to diesel refueling stations
  - Applied at facilities accustomed to trucks



# MD and HD Truck Electrification Resources

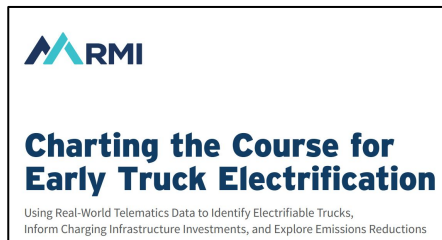
Per [Rocky Mountain Institute \(RMI\)](#), and [North American Council on Freight Efficiency \(NACFE\)](#), trucks of all sizes are ready for electrification.

65% of medium-duty and 49% of heavy-duty trucks are electrifiable today

Freight trucks in the United States produce an outsized amount of pollution. Although they make up only 10% of the vehicles on the road, they produce 25% of all greenhouse gas emissions from transportation.

## Resources:

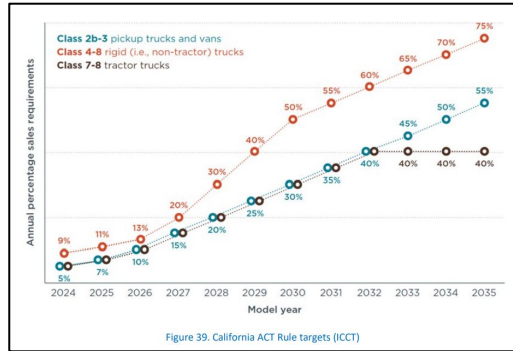
- [Charting the Course for Early Truck Electrification](#)
- [Electric Trucks Have Arrived: The Use Case for Heavy Duty Regional Haul Tractors](#)
- [Electric Trucks, Where They Make Sense](#)



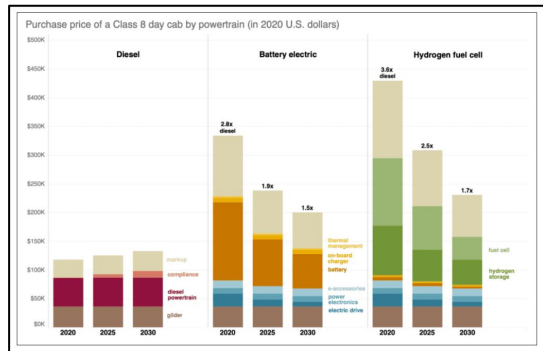
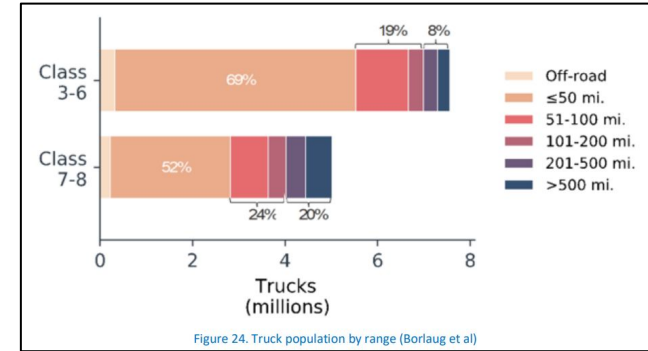


# NACFE Report Info Samples

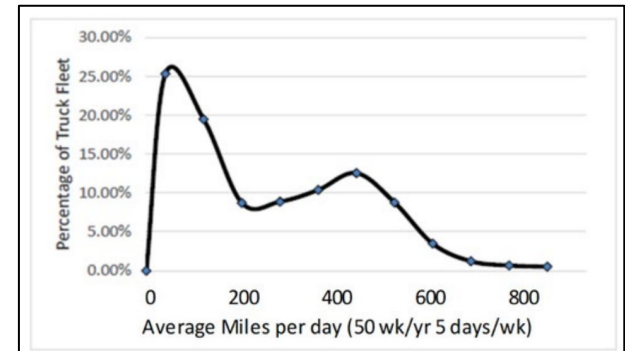
## ZEV Truck Sales by Class Forecast



## Market % by Class and Range



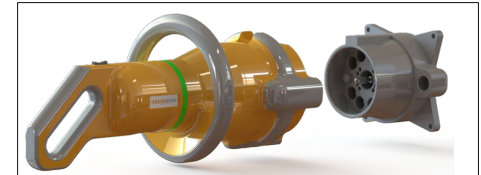
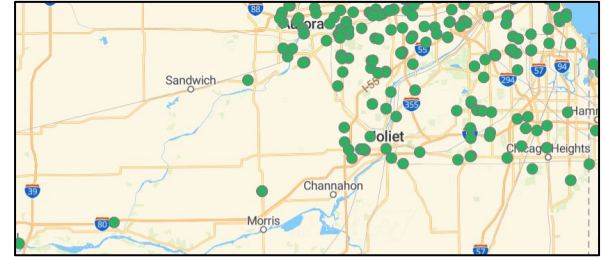
## Cost per Vehicle Forecast by type



## Miles per day by % of Truck Fleet

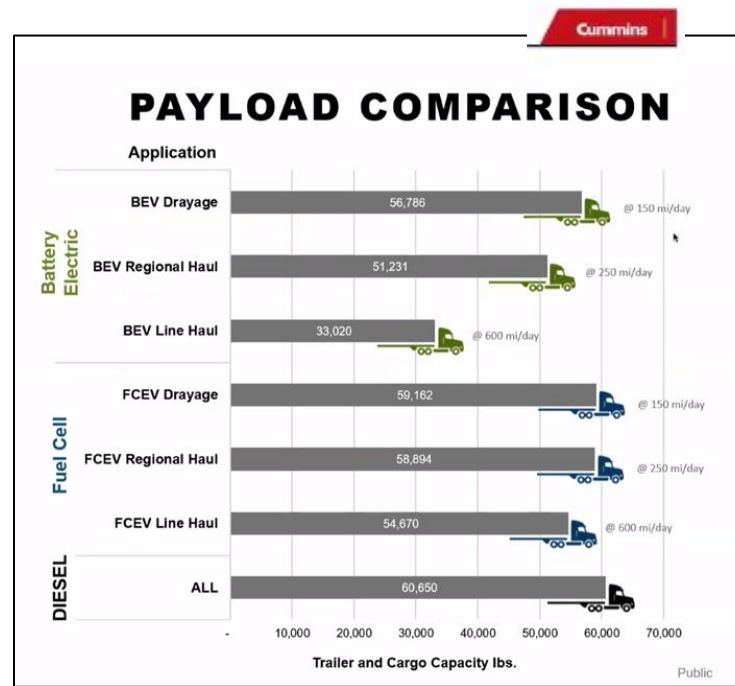
# MD/HD EVs and Charging Stations Considerations

- Difference in charging needs between passenger and larger vehicles
  - Station must be enroute, tied to logistics, EVSEs w/ high up time
  - Reasonable charging duration - time is money
  - Communications
    - Reservations, wait lists
    - Signage, charging level info
    - Smart device and or dashboard connectivity
    - Connector availability and size
    - Station/ connector status



# MD/HD EVs and Charging Station Considerations

- Recharge power levels vs. wait time
  - NEVI has viable approach (@four 150 kW chargers)
  - Some retailers considering making one of the DCFCs @ 350 kW
- Range and payload limitations
  - Payload is revenue - pillows vs. bricks
  - Larger trucks have more payload constraints
  - Good fit for many MD applications
  - Availability and proximity of other EVSEs, including home base charging



# MD/HD EVs and Charging Station Considerations

- Site design considerations
  - Size of trucks
  - Truck queuing
  - Turning radii
  - Access and egress
  - EV Charger spacing
  - Cord length
  - Proximity to vehicle ports
  - Truck queuing, truck length and plug in locations on vehicles



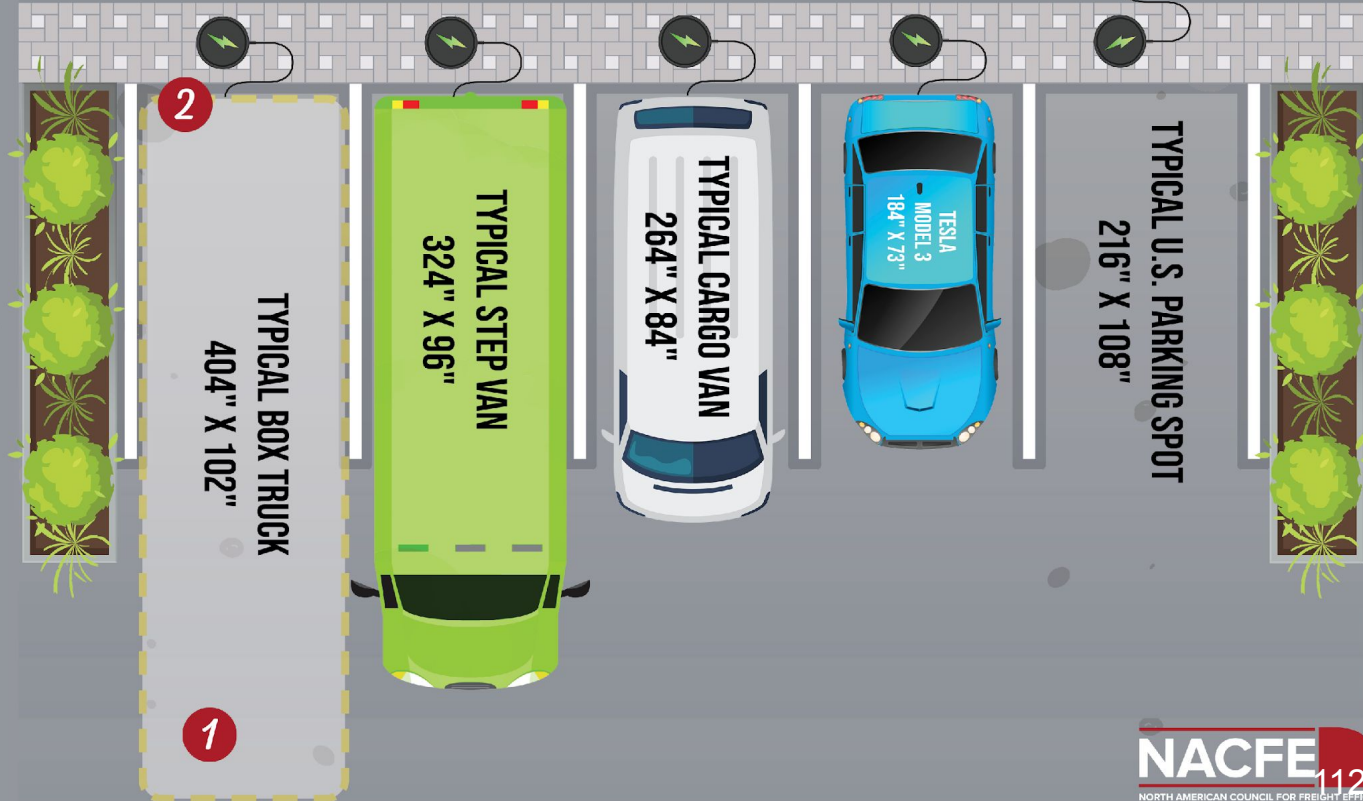
Daimler E-truck Charging Station, Portland, OR

# COULD A BOX TRUCK CHARGE AT A PUBLIC CHARGER?

1 The average box truck wouldn't fit into a typical US parking space, providing it could maneuver around parking lot landscaping.

2 Even if the box truck could fit into the parking space, the charger cord would not be long enough to reach the truck's charging port, which is usually near the front of the truck.

3 Ultimately, if the box truck could pull in parallel to the chargers, the cord should reach the truck's charging port.



TYPICAL BOX TRUCK  
404" X 102"

3

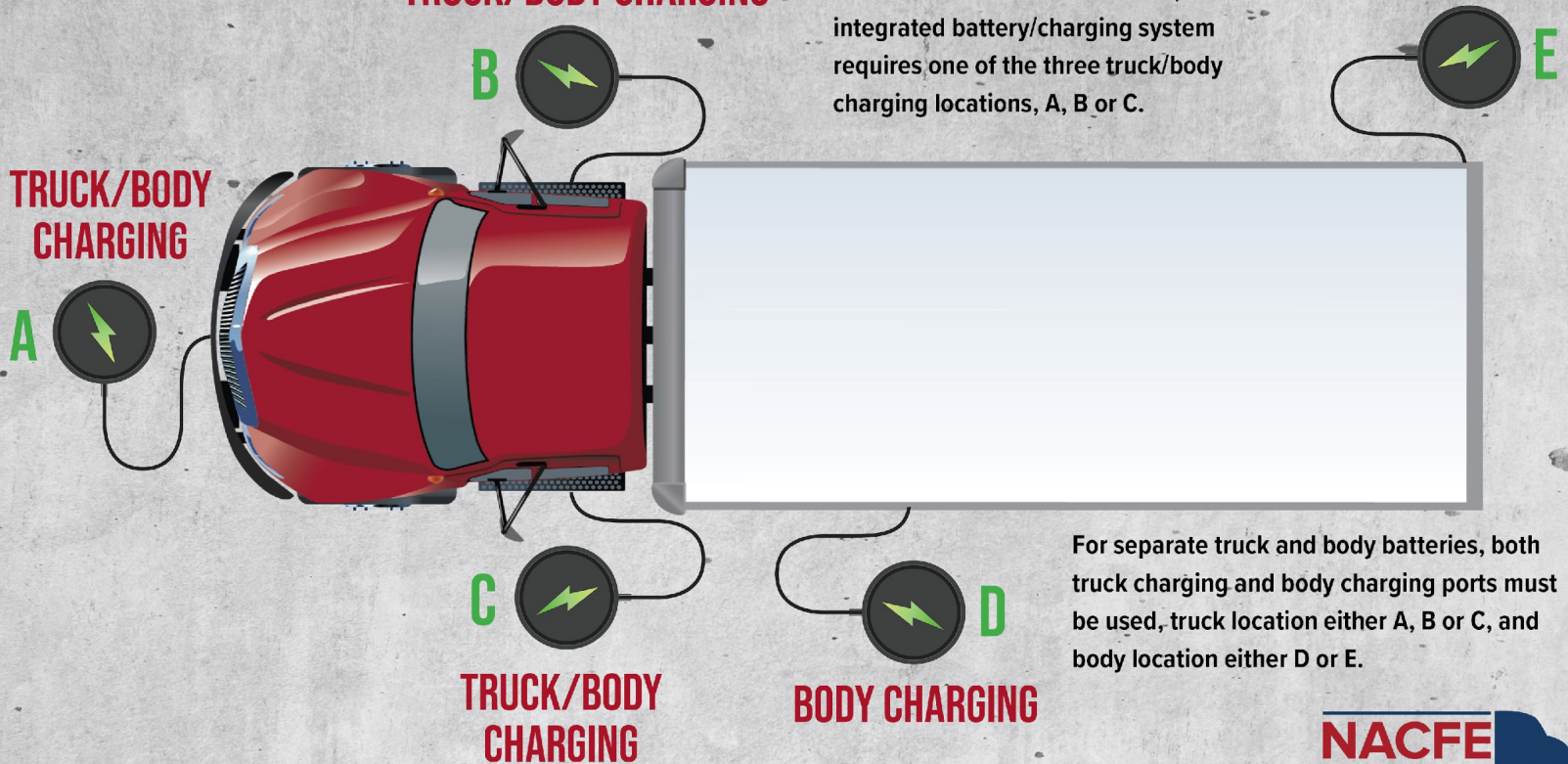


# BOX TRUCK CHARGING PORT LOCATIONS

## TRUCK/BODY CHARGING

**Charging locations on medium-duty box trucks are not standardized, so an integrated battery/charging system requires one of the three truck/body charging locations, A, B or C.**

## BODY CHARGING







# Electric and CNG Vehicles and Station Locator

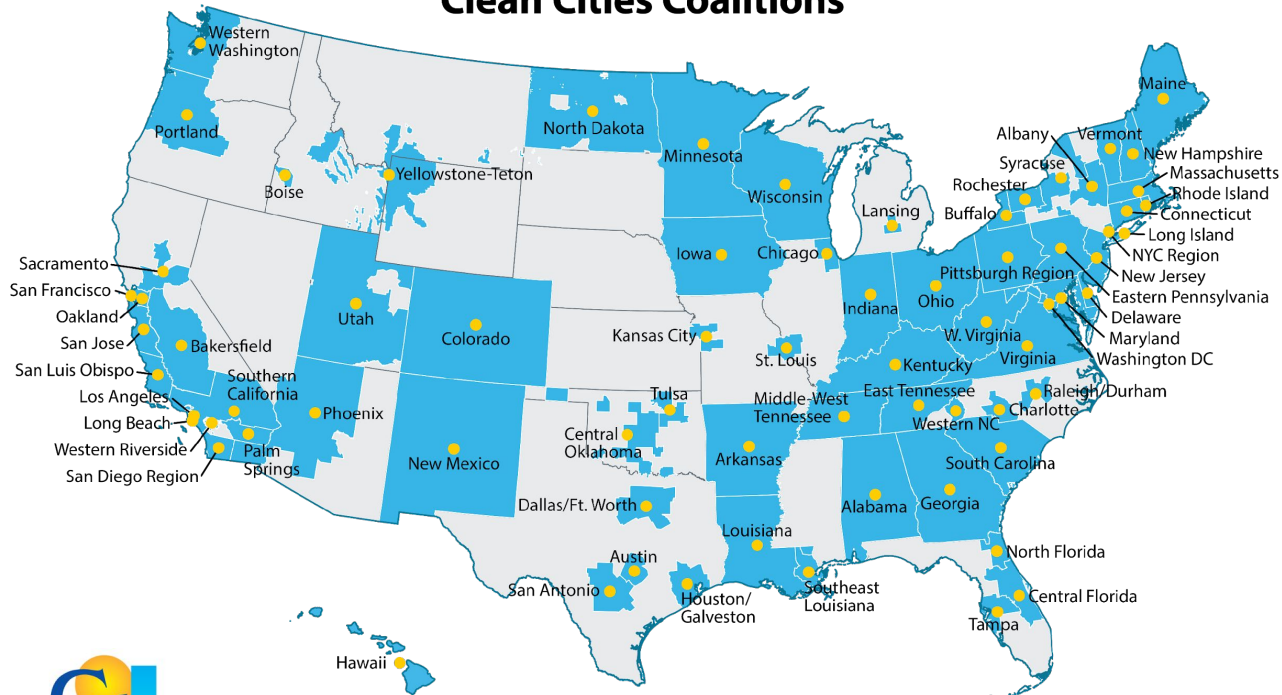
Samantha Bingham  
Chicago Area Clean Cities Coordinator

# National Network of Clean Cities Coalitions

More than 75 active coalitions covering nearly every state with thousands of stakeholders

[cleancities.energy.gov](http://cleancities.energy.gov)

## Clean Cities Coalitions



Map Date: 2/3/22

# Technology Integration Program

Provides objective/unbiased data and real-world lessons learned that inform future research needs and support local decision-making



# Alternative Fuels Data Center: Tools

[afdc.energy.gov/tools](https://afdc.energy.gov/tools)

## Alternative Fuels Data Center

Search the AFDC

FUELS & VEHICLES

CONSERVE FUEL

LOCATE STATIONS

LAWS & INCENTIVES

Maps & Data

Case Studies

Publications

Tools


About

Home


[EERE](#) » [AFDC](#) » Tools

### Tools

The Alternative Fuels Data Center offers a large collection of helpful tools. These calculators, interactive maps, and data searches can assist fleets, fuel providers, and other transportation decision makers in their efforts to advance alternative fuels and energy-efficient vehicle technologies.




#### Calculators




##### [EVI-Pro Lite](#)

Estimate a city or state's need for vehicle charging and the effect on electric load.




##### [AFLEET Tool](#)

Calculate a fleet's petroleum use, cost of ownership, and emissions.




##### [Vehicle Cost Calculator](#)

Compare cost of ownership and emissions for most vehicle models. [mobile](#)




##### [VICE Model](#)

Evaluate the financial case for natural gas vehicles and battery electric buses.




##### [JOBS Model](#)

Estimate economic impacts of deploying alternative fuel and charging infrastructure.




##### [Heavy-Duty Vehicle Emissions](#)

Calculate the emissions of alternative fuel medium- and heavy-duty vehicles.




##### [EVolution: E-Drive Vehicle Education](#)

Understand the costs and benefits of electric vehicles based on location.




#### Interactive Maps




##### [Alternative Fueling Station Locator](#)

Locate alternative fueling stations and get maps and driving directions. [mobile](#)




##### [Alternative Fuel Corridors](#)

Find maps and station data to help with nominating alternative fuel corridors.




##### [TransAtlas](#)

Explore light-duty vehicle registration counts over time by state and fuel type.




##### [Coalition Locations](#)

Find Clean Cities coalitions and contact information for coordinators.




##### [Energy Zones Mapping Tool](#)

Identify potential energy resource areas and energy corridors in the United States.




##### [ATRAVEL Tool](#)

Estimate costs, travel time, and emissions for private vehicles and other travel modes.




#### Data Searches




##### [Vehicle Search](#)

Compare all classes of alternative fuel vehicles, electric vehicles, and hybrids.




##### [Laws and Incentives Search](#)

Search for laws and incentives related to alternative fuels and advanced vehicles.




##### [Battery Policies and Incentives](#)

Find policies and incentives for batteries developed for EVs and energy storage.




##### [Fuel Properties Comparison](#)

Compare alternative fuel properties and characteristics.



##### [Find a Car](#)

Compare fuel efficiency, costs, carbon footprints, and emissions. [mobile](#)



##### [State Information](#)

Find state information about alternative fuels and advanced vehicles.

117



# AFDC Vehicle Search

Compare all classes of alternative fuel vehicles, electric vehicles, and hybrids.

- [afdc.energy.gov/vehicles/search](https://afdc.energy.gov/vehicles/search)

## Alternative Fuels Data Center

Search the AFDC

FUELS & VEHICLES

CONSERVE FUEL

LOCATE STATIONS

LAWS & INCENTIVES

Maps & Data

Case Studies

Publications

Tools

About

Home

EERE » AFDC » Tools » Vehicle Search

Printable Version

### Alternative Fuel and Advanced Vehicle Search

Find and compare alternative fuel vehicles (AFVs), engines, and hybrid/conversion systems. Some of the light-duty AFVs may count toward vehicle-acquisition requirements for [federal fleets](#) and [state and alternative fuel provider fleets](#) regulated by the Energy Policy Act (EPAAct). To download lists of light-duty vehicles for past model years, see the [publications search](#).

Download a complete list:  
[Light-Duty Vehicles](#)   
[All Vehicles](#)

#### Vehicles by Type

 <a href="#">Sedan/Wagon</a>	 <a href="#">Pickup</a>	 <a href="#">SUV</a>	 <a href="#">Van</a>
 <a href="#">Step Van</a>	 <a href="#">Vocational/Cab Chassis</a>	 <a href="#">Street Sweeper</a>	 <a href="#">Refuse</a>
 <a href="#">Tractor</a>	 <a href="#">Passenger Van/Shuttle Bus</a>	 <a href="#">Transit Bus</a>	 <a href="#">School Bus</a>

#### Vehicles by Manufacturer

Light-Duty  

All

SEARCH

Medium- and Heavy-Duty  

All

SEARCH

#### Engines and Hybrid/Conversion Systems

For medium- and heavy-duty vehicles:

ENGINE & POWER SOURCES

CONVERSION & HYBRID SYSTEMS

ABOUT THE DATA



# NGV America Vehicle Availability

Compare manufacture conversion systems that have been certified and approved by the U.S. Environmental Protection Agency and/or the California Air Resources Board.

- [ngvamerica.org/vehicles/availability](https://ngvamerica.org/vehicles/availability)

NGVAMERICA			
<a href="#">WHY NGV?</a> <a href="#">ENVIRONMENT</a> <a href="#">VEHICLES</a> <a href="#">FUEL</a> <a href="#">POLICY</a> <a href="#">PODCAST</a> <a href="#">OPPORTUNITIES</a>			
Manufacturers & Modifiers			
<div>Sort By Category</div> <div>Order By Title</div> <div>Type To Search</div>			
LIGHT-DUTY/MEDIUM-DUTY RETROFITS <b>AGA Systems</b> agasystemsinc.com	HEAVY-DUTY VOCATIONAL OEMS <b>ALF Condor</b> flic.kr.p52h1uH5	LIGHT-DUTY/MEDIUM-DUTY RETROFITS <b>Altech-Eco</b> transecoenergy.com	HEAVY-DUTY VOCATIONAL OEMS <b>Autocar Truck</b> autocartruck.com
HEAVY-DUTY BUS OEMS <b>Blue Bird Bus</b> blue-bird.com	HEAVY-DUTY VOCATIONAL OEMS <b>Capacity</b> capacitytrucks.com	HEAVY-DUTY RETROFIT/REPOWERS <b>Clean Air Power</b> cleanairpower.com	HEAVY-DUTY VOCATIONAL OEMS <b>Crane Carrier</b> cranecarrier.com
LIGHT-DUTY/MEDIUM-DUTY RETROFITS	HEAVY-DUTY RETROFIT/REPOWERS	HEAVY-DUTY BUS OEMS	HEAVY-DUTY VOCATIONAL OEMS





# Vehicle Cost Calculator

Compare all classes of alternative fuel vehicles, electric vehicles, and hybrids.

- [afdc.energy.gov/calc](https://afdc.energy.gov/calc)



## Vehicle Cost Calculator

This tool uses basic information about your driving habits to calculate total cost of ownership and emissions for makes and models of most vehicles, including alternative fuel and advanced technology vehicles. Also see the cost [calculator widgets](#).

ASSUMPTIONS

### Choose vehicles to compare

Select up to eight vehicles to compare from the makes and models below or [create your own custom vehicle](#).

[Create Custom Vehicle](#)

### Tell us how you use your car

Because vehicle efficiencies vary depending on how you use your car, this information allows the tool to more accurately calculate fuel usage.

## Results

- ✓ Total cost of ownership
- ✓ Annual fuel use and operating costs
- ✓ Cost per mile



## Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool

Calculate a fleet's petroleum use, cost of ownership, and emissions.

- [greet.es.anl.gov/afleet](http://greet.es.anl.gov/afleet)



### AFLEET Tool (xls)

The AFLEET spreadsheet provides detailed energy, emission, and cost data for light-duty, heavy-duty, and off-road AFVs. It has the following 5 calculators depending on the user's goals:

- Simple Payback
- Total Cost of Ownership
- Fleet Footprint
- Idle Reduction
- Electric Vehicle Charging



### AFLEET Online

AFLEET Online replicates the spreadsheet's Simple Payback Calculator with a user-friendly interface and analyzes the following metrics:

- Petroleum use
- Greenhouse gas emissions
- Air pollutant emissions
- Simple payback



### HDVEC

The Heavy Duty Vehicle Emissions Calculator (HDVEC) is an AFLEET-based online tool that compares NOx, PM, GHGs and funding cost-effectiveness of environmental mitigation projects for the following fuel types:

- Diesel
- Electric
- Natural Gas
- Propane



### ATRAVEL

The ATRAVEL Tool was developed to estimate costs, travel time, and emissions of private vehicle ownership and other travel modes based on your location and travel patterns, while also providing related travel metrics at both local and regional levels. The travel modes currently included are:

- Private vehicle
- Transit
- Ridehail



# Alternative Fueling Station Locator

Locate alternative fueling stations and get maps and driving directions.

- [afdc.energy.gov/stations](https://afdc.energy.gov/stations)

## Alternative Fueling Station Locator

Find alternative fueling stations in the United States and Canada. For U.S. stations, see [data by state](#). For Canadian stations in French, see [Natural Resources Canada](#).

Public Stations

Advanced Filters

Corridor Measurement

40,091 results in

U.S. and Canada

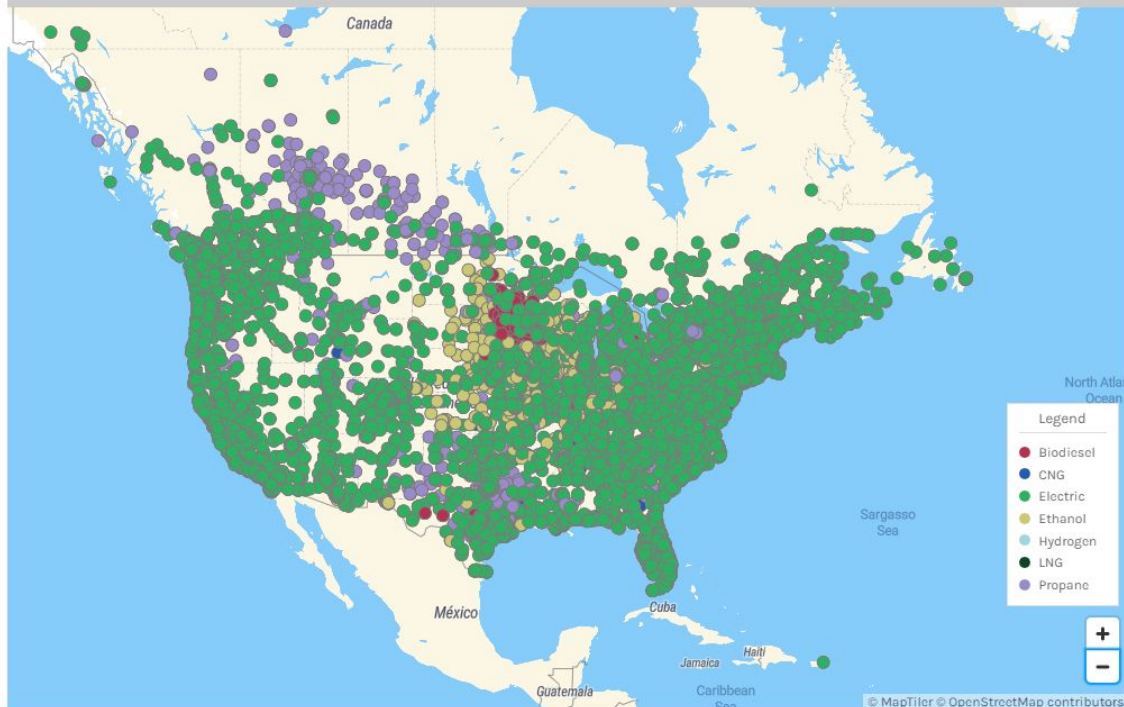
Enter location



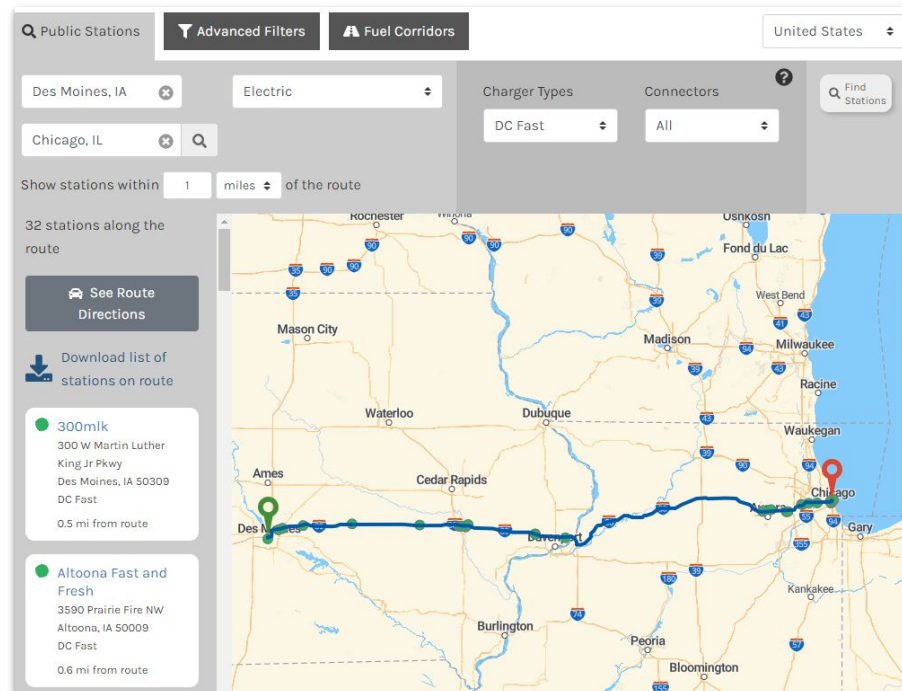
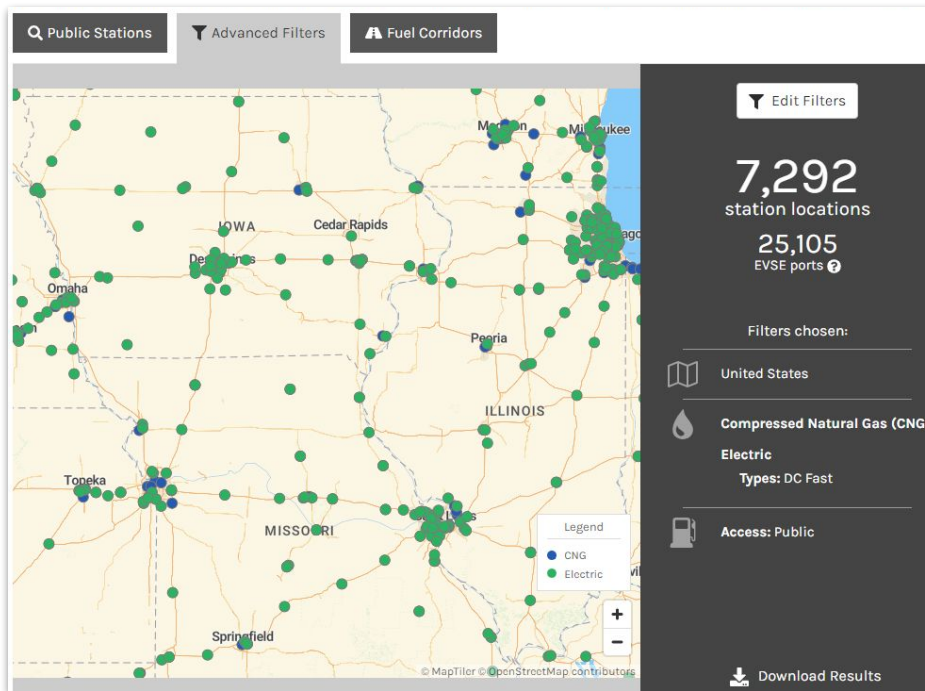
All Fuels



Map a Route



# Alternative Fueling Stations







# Federal and State Laws and Incentives Database

Find federal and state laws and incentives for alternative fuels and vehicles, air quality, fuel efficiency, and other transportation-related topics.

- [afdc.energy.gov/laws](https://afdc.energy.gov/laws)

## Alternative Fuels Data Center

Search the AFDC [SEARCH](#)

[FUELS & VEHICLES](#) [CONSERVE FUEL](#) [LOCATE STATIONS](#) [LAWS & INCENTIVES](#) [Maps & Data](#) [Case Studies](#) [Publications](#) [Tools](#) [About](#) [Home](#)


[EERE](#) » [AFDC](#) » [Laws & Incentives](#) [Printable Version](#)

### Federal and State Laws and Incentives


Find federal and state laws and incentives for alternative fuels and vehicles, air quality, fuel efficiency, and other transportation-related topics.


 **Federal**

[Recent Federal Actions](#)  
[Key Federal Legislation](#)

 **State**

[Recent State Updates](#)  
[Local Examples](#)  
[Utility Examples](#)

 **Search**  
by category or keyword

 **See All**  
in summary tables

For questions or to submit an incentive, email the [Technical Response Service](#). For additional incentives, search the [Database of State Incentives for Renewables & Efficiency](#).

*This information provides an overview of laws and incentives and should not be your only source of information for making decisions about vehicle purchases, taxes, or other binding agreements. Please refer to the federal and state contacts included to verify these laws and incentives are still applicable, and consult your tax advisor.*

[ABOUT THE DATA](#) [Download Data](#) [Data Fields](#) [Developer API](#)

#### Technology Bulletins

 **Connecting Dots and Bridging Gaps: Alternative Fueling Corridors**

[All Technology Bulletins](#)

[+ Maps & Data](#)

[+ Case Studies](#)

[+ Publications](#)

[+ Tools](#)

# Questions



**Tim Milburn**



**Samantha Bingham**



# Local Success Stories



Photo by Dennis Schroeder / NREL

# Local Stories Participants



**OZINGA**  
ENERGY

Ryan Jacobs  
Account Exec



Andrew Poliakoff  
Federal Affairs  
Lead



Naperville

Dick Dublinski  
Director of Public  
Works



Mark Rowe  
General Sales  
Manager



LION

Brian Robb  
Government  
Relations Director

# Ozinga Energy NGV Refueling

**Ryan Jacobs**  
Account Executive  
Ozinga Energy





Ozinga Energy is a renewables company focused on transportation fuels.  
Our projects create real environmental impact and sustainable economic returns.













Since being established by Ozinga Bros. in 2012 to improve their own fleet, our company has become the leader in Compressed Natural Gas (CNG) solutions in the Midwest and West Coast. We operate the largest public CNG/RNG fueling network in Chicagoland and handle everything from new construction to service and preventative maintenance for CNG filling stations all over the U.S.

Ozinga Energy has now crossed over into Renewable Natural Gas (RNG). We operate a gas processing plant in Indiana that is fed biogas from several local dairies. The finished RNG is chemically identical to natural gas but has a negative carbon footprint. In addition to this huge undertaking, we also have several other RNG and biogas projects in the works. We pride ourselves in being very diverse in alternative fuels. In addition to our Natural Gas offerings, we also provide Electric Vehicle (EV) charging solutions for all applications and budgets.







# Mokena, IL Public CNG Station (I-80 and US 45 S)



**OZINGA**  
Public access fast-fill station

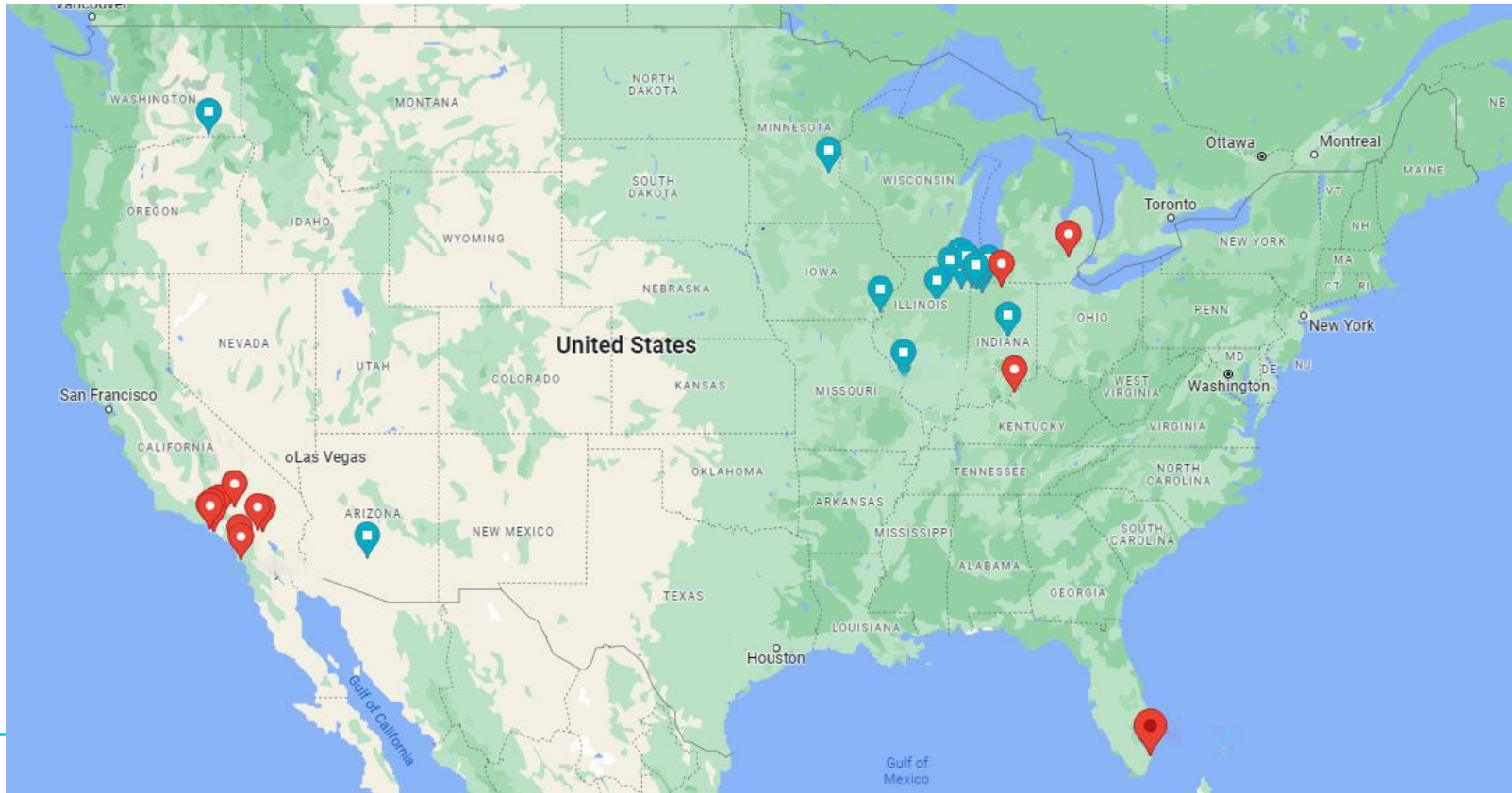
Compressor

Time-fill posts for fleet use





## National Operations







Site in CA built

**OZINGA**  
**ENERGY**

fo



National Ready  
Mixed  
Concrete Company





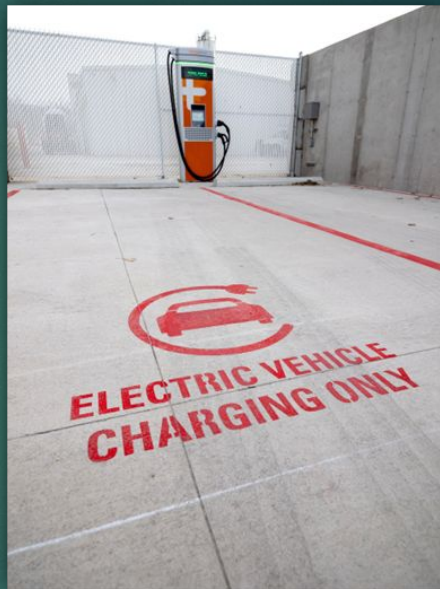


# Why Dairy RNG?



# EV Charging Retail Experience

- Ozinga designed and installed EV charging stations at several locations.
- These include two DC – Fast Chargers (pictured) and dozens of Level 2 Chargers for their own sites and local municipalities.
- Chargers supported by local and federal incentives.
  - Key to investment evaluations



*New Buffalo, MI*



*Sturtevant, WI*



Thank you and please direct any questions  
to [RyanJacobs@OzingaEnergy.com](mailto:RyanJacobs@OzingaEnergy.com)





# DC Fast Charging

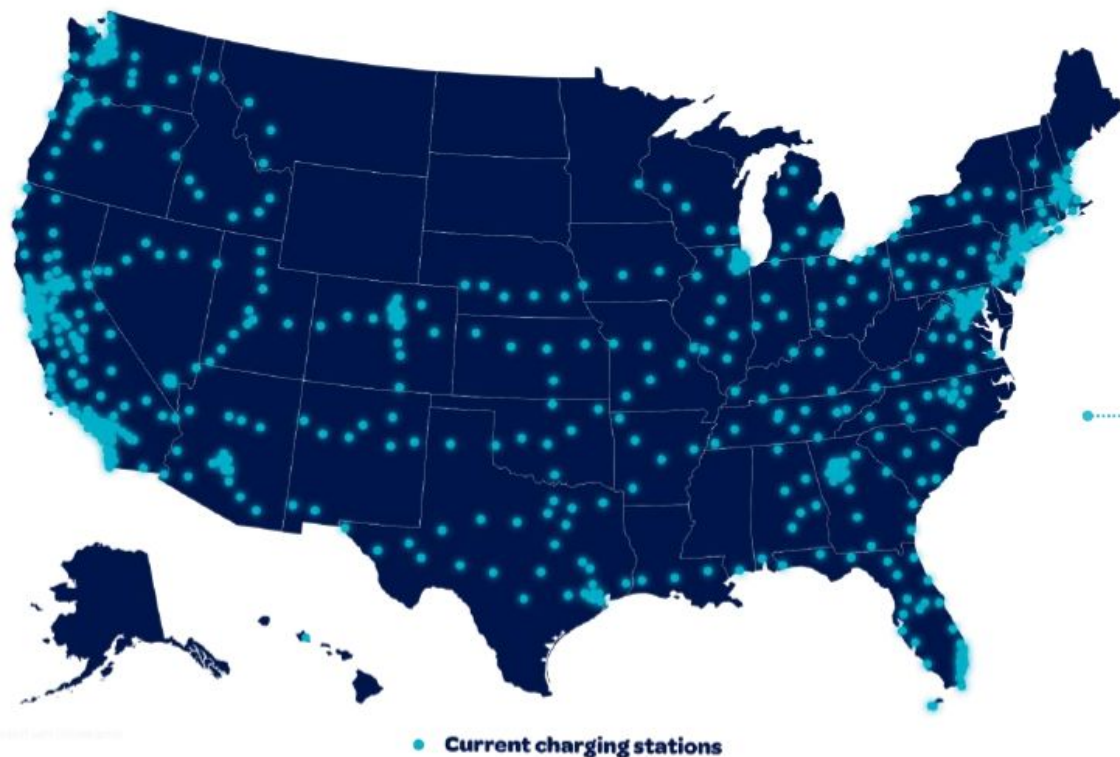
Andrew Poliakoff

Electrify America  
Federal Affairs Lead

# Electrify America Corridor Charging Success



# Electrify America is the largest open ultra-fast network



## NUMBER OF STATIONS

May 2018

1

Today

791

December 2025\*

1,700

## NUMBER OF CHARGERS

May 2018

4

Today

3,435

December 2025\*

9,500

\*Installed or Under Development

# There is an unprecedented opportunity to build the highway corridor charging infrastructure that America needs

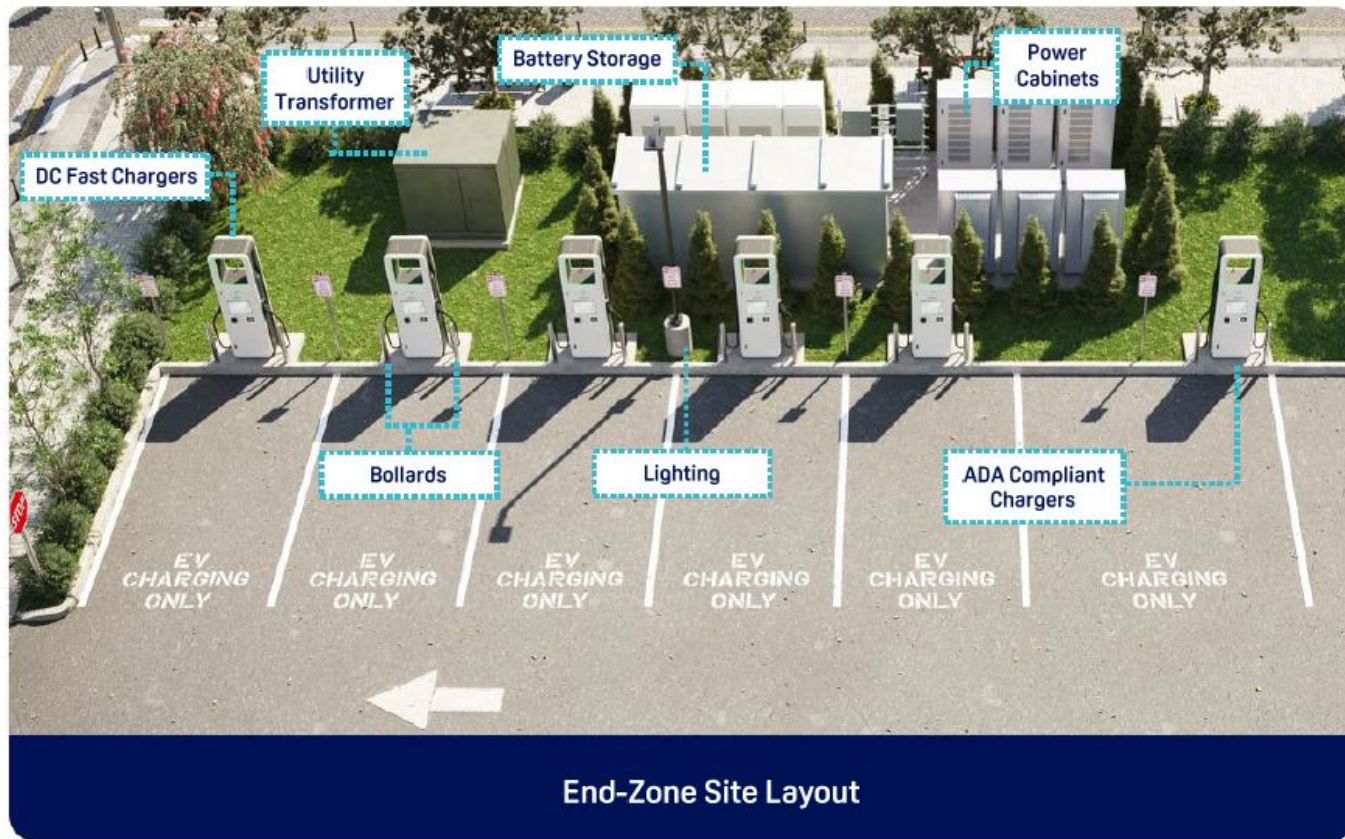
The Infrastructure Investment and Jobs Act (IIJA) calls for \$7.5 billion in new spending for EV charging infrastructure

- ⚡ \$6.25 billion dedicated to highway corridor charging
- ⚡ Illinois would receive \$149 million to support expanded EV charging under five-year, \$5 billion formula funding program
- ⚡ Funds must be dedicated to charging along designated Alt Fuels Corridors until complete
- ⚡ Electrify America currently owns and operates 27 ultra-fast charging stations in Illinois with numerous others on the way
- ⚡ 2 x 150 kW & 2 x 350 kW on I-80 in Joliet in the Walmart parking lot.





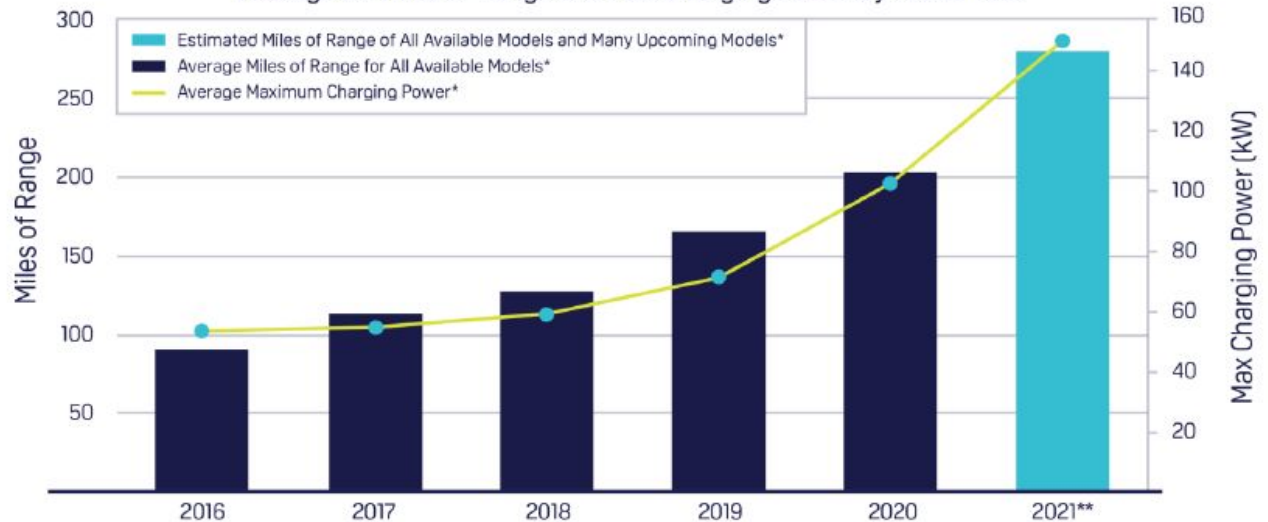
## Electrify America builds customer-centric ultra-fast charging stations





# Ultra-fast corridor charging is necessary to serve the vehicles of today – and tomorrow

Average EV Miles of Range and Max Charging Power by Model Year



\*Excludes Tesla

\*\*Ranges from upcoming 2021 models are based on manufacturer claims for announced models and not yet rated by EPA

## Example 2021 vehicle models:



**Ford Mustang Mach-E**  
150 kW



**Hyundai IONIQ 5**  
225 kW



**Volvo XC40 Recharge**  
150 kW



**Lucid Air**  
350 kW

# Electrify America is the network of choice for partners and drivers



## Fastest

Most 150kW and 350kW  
developed and owned

## Trusted

Partnered with nation's largest  
retailers and shopping centers



## Chosen

Selected by car brands  
for embedded offers

## Customer Centric

Recognized for reliability  
and technology innovation



umlaut

Ultra-fast, reliable charging is everything



# City of Naperville CNG Station

Dick Dublinski

Director Public Works  
City of Naperville, Illinois



An aerial photograph of the Naperville CNG Station. The station features two CNG pumps with a white canopy and red and blue arrows. To the left is a large electrical substation with various transformers and equipment. In the background, there is a large parking lot filled with cars, a baseball field with a red infield, and a road. A large white water tower is visible on the far left. The text "Naperville CNG Station" is overlaid in white on the image.

# Naperville CNG Station





## Location

- 1720 W. Jefferson Ave
- Just west of Ogden Ave



# Naperville CNG Station Facts

## Timeline

- Construction Started - June 2020
- Ribbon Cutting – Late November 2020

## Station Usage

- Over 300,000 GGE dispensed since opening Q1 2021
- Averaging 40+ visits per day
- One large primary user
- About a dozen other fleets purchasing fuel at the station

# Photos





# MD and HD E-Truck Manufacturing



Brian Robb

Government Relations Director  
Lion Electric







# LION ELECTRIC

I-80 Stakeholder Convening and  
Funding Updates



November 10, 2022



# Electric Vehicles + Electrification



- In 2020, transportation accounted for the largest portion of greenhouse gas (GHG) emissions in the U.S. 27%  
*\*Source: EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2020*
- In the U.S. MHDV are only 10% of the vehicles on the road but **contribute to 28% of total on-road GHG emissions**  
*\*Source: Union of Concerned Scientists, Now Is The Time For Heavy Duty Electric Vehicles*
- Electrification is a VIABLE business model
  - IRA - \$369B for energy and climate-related programs
  - IIJA - \$7.5 billion for a network of chargers and to advance EV adoption
  - EPA's \$1 billion for electric buses for nearly 400 school districts in 2022

# The Meaning of NEVI



- The Bipartisan Infrastructure Law has allocated \$5 billion for the National Electric Vehicle Infrastructure (NEVI) formula to build a nationwide EV charging infrastructure
- The funding will enable states to strategically deploy chargers and establish an interconnected network to facilitate data
- Lion is working with leading policy action groups such as the Zero Emission Transportation Association (ZETA), Electrification Coalition (EC), and many more to have the charging areas designated as public to include medium and heavy-duty vehicles (MHDV)

# Lion in Illinois



- The EPA's Clean School Bus Program awarded 36 electric school buses to Lion applicants in Illinois (around \$12 million), and **275 electric buses overall across the country; totalling nearly \$108M**
- Cook County is currently deploying zero-emission school buses
- Joliet is a central location – proximity to major highways and rail routes for distribution purposes
- Illinois and Will County have a rich history of manufacturing, skilled workforces, and emphasis on “Made in America”
- Every mile driven in an electric vehicle = more carbon neutrality (think I-80 Highway corridor)

# Lion in Joliet, Illinois



- Collaboration with elected officials, school districts and advocacy groups
- Partnerships with advocacy/environmental organizations and workforce/economic development groups
  - Will County Center for Economic Development - [Will County Center for Economic Development – Improving the quality of life for all residents of Will County \(willcountycd.com\)](#)
  - Environmental Law and Policy Center - [Environmental Law & Policy Center | Home \(elpc.org\)](#)
  - Electrification Coalition - [Electrification Coalition - Home](#)

# Lion in Joliet, Illinois

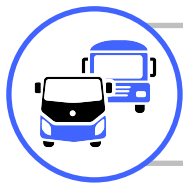


- 900,000+ ft<sup>2</sup>
- Largest U.S. manufacturing plant for medium and heavy-duty EV's
- 20,000 vehicles per year expected capacity at full scale after completion





# Lion Today



700+ electric vehicles in operation



More than 10 million zero-emission miles driven



Production in Saint-Jérôme, QC, Canada with annual capacity of 2,500 vehicles per year at full scale

New facility in Joliet, Illinois being equipped for vehicle production



Production at highly automated 5 GWh-per-year battery plant opening in Mirabel, QC, Canada on track to begin toward end of 2022

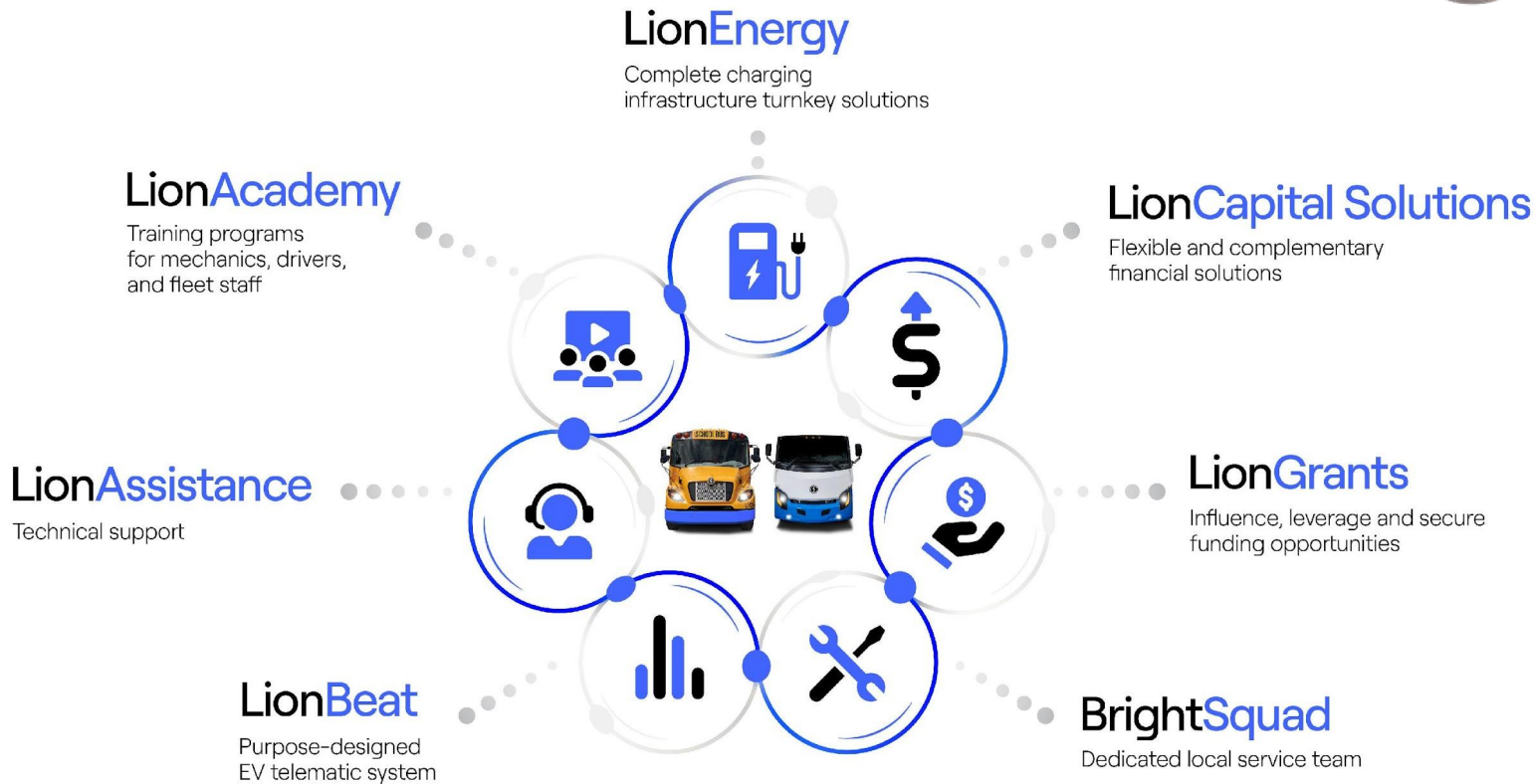


12 experience centers and 2 R&D centers across N.A.



+1,400 employees

# Lion Ecosystem



# Reimagining the School Bus



- According to the EPA, 25 million children ride a diesel-fuel school bus daily
- Zero-emission school buses:
  - Better health for students, bus drivers and teachers
  - Less noise pollution, added safety and modern comfort
  - School bus rides last less than 10% of a child's daily commute but contribute 33% of daily exposure to air pollutants. (*Source: California Air Resources Board*)
  - Estimated 80% fuel and energy cost reduction for school districts and fleet operators/owners. (*Source: Lion product sheets*)

# All-Electric School Buses



LIONA

1 LION SCHOOL BUS  
=  
ELIMINATING  
APPROXIMATELY  
**23 tons**  
of GHG



LIONC

All-Electric Type C  
School Bus

Up to 33,000 lb GVWR  
100-125-155 miles  
126-168-210 kWh



LIOND

All-Electric Type D  
School Bus

Up to 36,200 lb GVWR  
100-125-155 miles  
126-168-210 kWh



# All-Electric Urban Trucks



## LION6

### All-Electric Class 6 Truck

26,000 lb GVWR  
Up to 210 miles  
Up to 252 kWh



## LION8

### All-Electric Class 8 Truck

Up to 60,000 lb GVWR  
Up to 164 miles  
Up to 252 kWh



## LION8T

### All-Electric Class 8 Tractor Truck

Up to 82,000 lb GCWR  
Up to 260 miles  
Up to 653 kWh



MODULAR  
BATTERY  
APPROACH

1 LION TRUCK  
=  
ELIMINATING  
**100 tons  
of GHG**

\*EPA calculator.



# Call to Action



- Advocate investing in electric trucks and zero-emission school buses.
- Support legislation and policies that advance investments in electrification.
- Participate in conversations such as this one to highlight the future of electrification.
- Speed is key for policy effectiveness

# The bright move

## CONTACT

**Brian Robb**

**Government Relations Director**

[brian.rob主@thelionelectric.com](mailto:brian.rob主@thelionelectric.com)

# Panel and Questions



OZINGA  
ENERGY

Ryan Jacobs



Andrew Poliakoff



Naperville

Dick Dublinski



Mark Rowe



LION

Brian Robb

# Next Steps and Program Participation





# Survey

Will be provided to participants





# Contact Information

- Chris Schmidt, Illinois DOT: [DOT.DriveElectric@Illinois.gov](mailto:DOT.DriveElectric@Illinois.gov)
- Tim Milburn: Green Ways 2Go / Chicago Area Clean Cities: [Tim.Milburn@GreenWays2Go.com](mailto:Tim.Milburn@GreenWays2Go.com)
- Samantha Bingham, Chicago Area Clean Cities: [Sam@chicagocleancities.org](mailto:Sam@chicagocleancities.org)
- Tom Stephens, Argonne: [tstephens@anl.gov](mailto:tstephens@anl.gov)
- Marc Rowe, Trillium: [Marc.Rowe@trilliumenergy.com](mailto:Marc.Rowe@trilliumenergy.com)
- Ryan Jacobs, Ozinga: [ryanjacobs@ozingaenergy.com](mailto:ryanjacobs@ozingaenergy.com)

# *Thank You*

