EVs2Scale 2030

NASUCA

Britta Gross, EPRI Director of Transportation

24 MAY 2023

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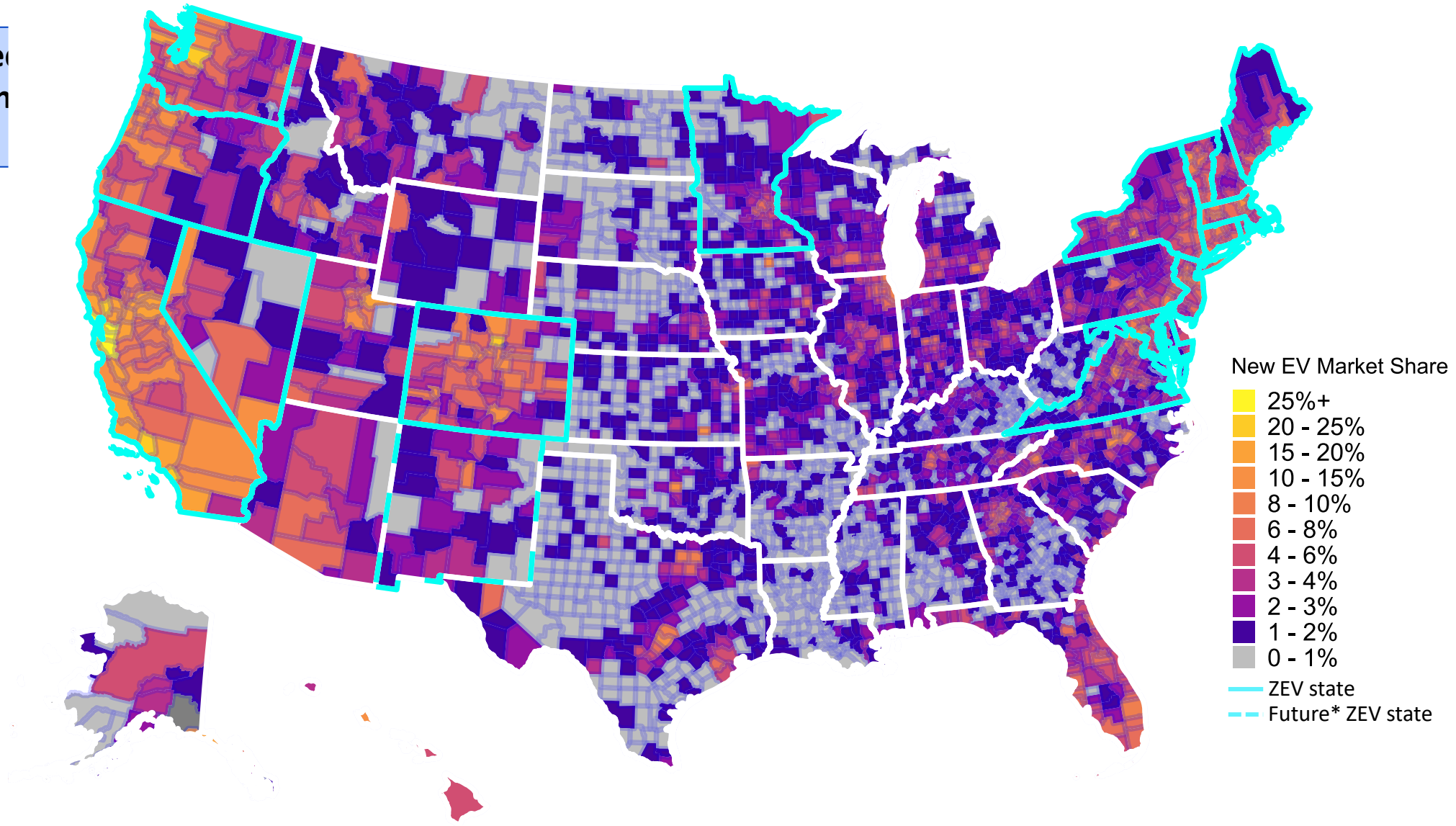
EVs2Scale2030 | U.S. Nationwide New EV Market Share (2022) = 7.3%

EVs2Scale 2030

- 204 counties exceed
- 38 states with coun exceeding avg



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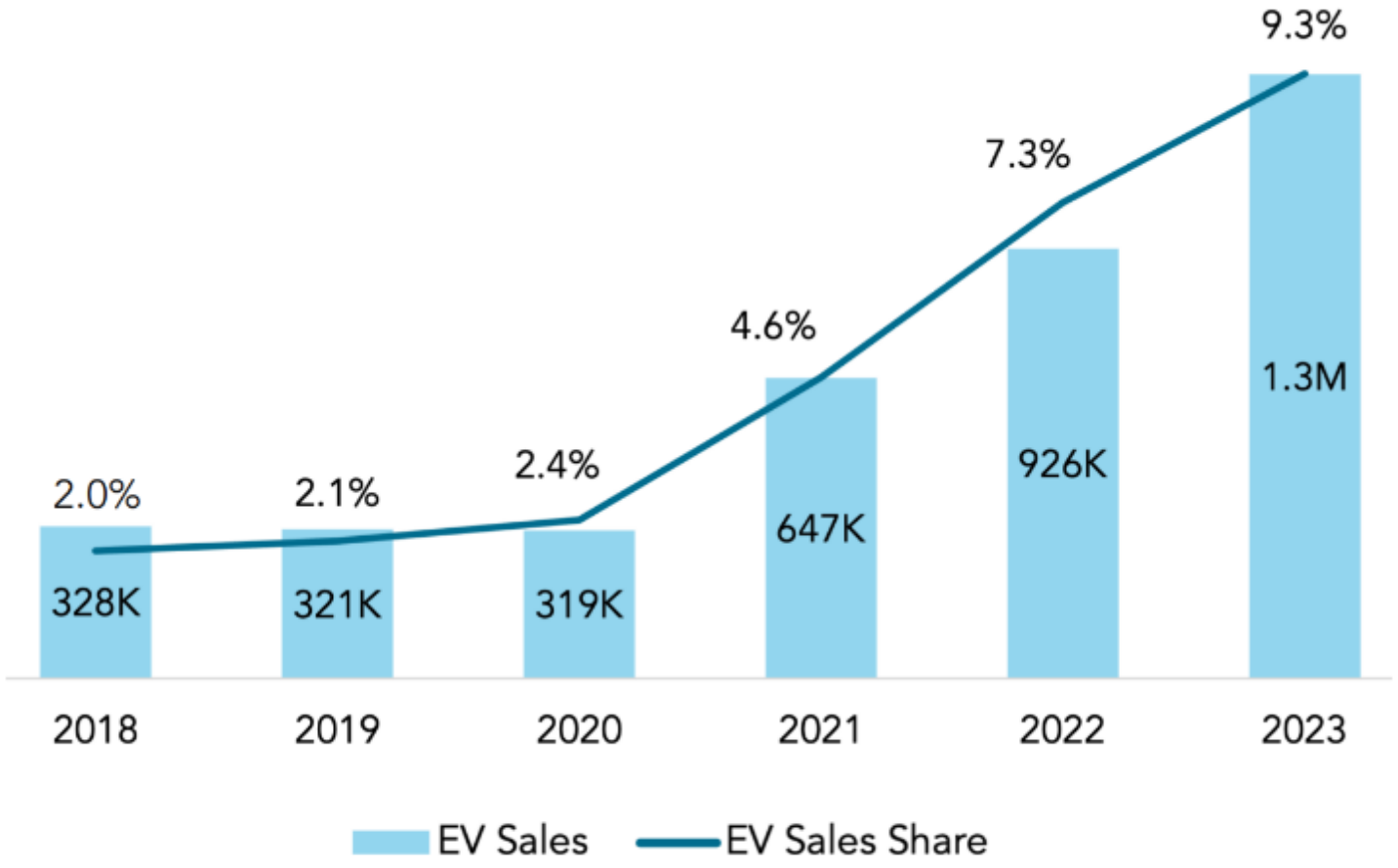
EV (BEV + PHEV) Sales Nearly Tripled Since 2020



Historical Sales: Alliance for Automotive Innovation / S&P Global Mobility | Research, 2023 Forecast & Chart: EVAdoption, LLC

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Background and Objectives

- Government, Industry, and Fleets are **increasingly aligning on aggressive 2030 vehicle electrification goals**
- **The pace of needed year-over-year action and investment to prepare charging sites and the grid is not clear**
- Consumers and fleet operators **must have confidence in charging availability, reliability, and affordability**
- Consumers and fleets operators are **increasingly looking to the utility industry to scale up efforts** to support charging solutions, ensure the grid is capable of meeting vehicle loads

THIS TRANSITION IS UNPRECEDENTED AND COMPLEX. IT REQUIRES:

- **Extraordinary collaboration and partnering** across all the major EV stakeholder groups
- **Redesigned processes, useful tools, and increased standardization** to simplify the planning and complex interactions between major stakeholder groups
- **An evaluation of regulatory/board oversight** that may not be conducive to driving actions on the pace and scale required to meet 2030 targets

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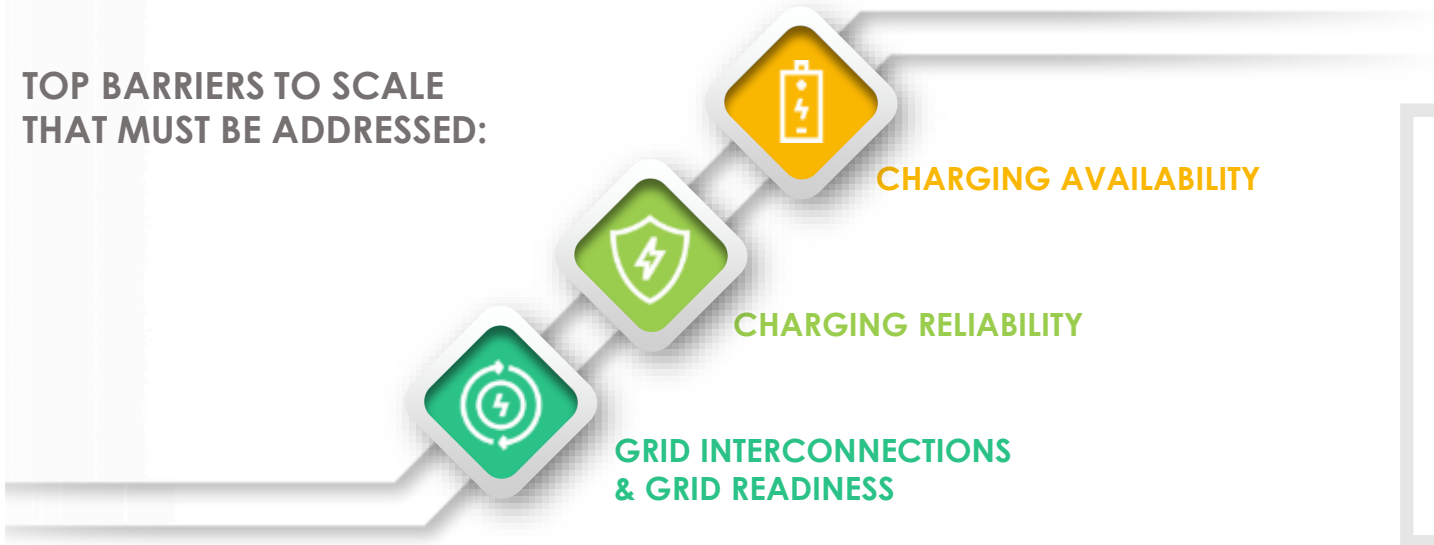
2022 2023 2024 2025 2026 2027 2028 2029 **2030** 50% EV Sales **2035+** 100% EV Sales

EVs2Scale2030

The "EVs2Scale2030" initiative is a three-year commitment focused on **leveraging industry scale to galvanize and align critical market stakeholders as EV goals increasingly target 50% EV market share by 2030.** EPRI will leverage its industry partnerships to mobilize utilities, OEMs, fleet operators, and charging providers, and coordinate with federal agencies and labs to support the rapid deployment of millions of electric vehicles – while minimizing grid impacts and enabling critical grid benefits.

TOP BARRIERS TO SCALE THAT MUST BE ADDRESSED:



3 ENABLING ACTIONS:

1. **Ensure utilities (and regulators) are in lock-step** with vehicle OEMs, fleets, and consumers
2. **Optimize systems and processes** that support the pace of activity/investment required
3. **Develop needed tools and technologies** that enable EV scale and capture EV grid benefits

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Three-Pillar Strategy

EVs2Scale 2030

1 COALITIONS & ROADMAPS

Bilateral Convening Series
- Utility-OEM Forum
- Utility-Fleet Forum

National EV Driver Research Board

50-state roadmap to 2030
outlining EV loads, grid impacts, leadtimes, workforce, costs

2 STRUCTURAL SYSTEM REFORMS

Charging Infrastructure
- Reliability: Benchmarking, Standards
- Charging innovation & affordability

Grid Readiness
- Streamlined Grid Interconnect
- Managed Charging at Scale
- Interconnect Standards for V2H/V2B/V2G

3 UNIFYING TOOLS & PILOTS

- Approved Product List (APL)
- NEVI/NEHC Coordination with EEI

- GridFAST Online Data Exchange
- OEM/Utility V2H/V2B Pilot
- EV Resilience/Evacuation Pilot

Enabling Regulatory and Oversight Framework

Equity Blueprint & Workforce Development

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Collaboration + Partnerships

EVs2Scale2030

UTILITY INDUSTRY

EPRI
LPPC Large Public Power Council
EEI
NRECA America's Electric Cooperatives
American Public Power Association
Alliance for Transportation Electrification
NASUCA National Association of State Utility Consumer Advocates
NARUC National Association of Regulatory Utility Commissioners

AUTO & TRUCKING INDUSTRY

Ford
Tesla
BMW
Audi
Toyota
Mercedes-Benz
Volvo
PACCAR
GM
Rivian
Daimler
Honda
Alliance for Automotive Innovation
Volkswagen
NACFE North American Council for Freight Efficiency
NADA

FLEET OPERATORS

amazon
Penske
enterprise Fleet Management
US Foods
Uber
Lyft
Walmart Save money. Live better.
Pitt Ohio Supply Chain • Ground • LTL • TL
FedEx Federal Express
J.B. Hunt
element
NAFA Fleet Management Association
LeasePlan

CHARGING PROVIDERS AND FUELING RETAILERS

Circle K
electrify america
flo EV Charging
chargepoint
EVgo Fast Charging
bp
Shell

NGO & STANDARD-SETTING ORGANIZATIONS

NRDC
EDF Environmental Defense Fund
RMI
CHARIN
SAE International
ATLAS Public Policy
Plug In America
Electric Vehicle Association

GOVERNMENT

- Joint Office of Energy & Transportation (JOET)
- US DOE
- US DOT
- National Labs
- FERC/NERC
- State DOEs, DOTs, DEQs
- State PUCs
- League of Cities
- Climate Mayors

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THE WHITE HOUSE

EVs2Scale2030

April 17, 2023: Biden-Harris Administration Announces new private and public sector investments to support America's historic transition to EVs under the EV Acceleration Challenge."

> *This June, EPRI is committing to launch "EVs2Scale2030", a new three-year initiative to mobilize 500 industry stakeholders including, utilities, vehicle manufacturers, fleet operators, and charging providers, to ready the grid and accelerate the charging infrastructure needed to support the large-scale electrification of transportation.*

UTILITY DIVE

EPRI launches 3-year initiative to address grid constraints, develop tools to serve coming EV loads

Published April 19, 2023
Robert Walton, Senior Reporter

Dive Brief:

- Rising loads associated with electric vehicle charging will begin to stress the power grid over the next few years, and a three-year initiative by the Electric Power Research Institute aims to ease the electric transition.
- EVs2Scale2030 will launch in June to develop a timeline of anticipated EV loads down to the distribution circuit level, along with processes and tools to help standardize the interconnection and serving of new transportation loads, said EPRI Director of Transportation Britta Gross.
- The initiative is "all about addressing the problems of getting to scale, and then sustaining scale when we get there," Gross said. Among the tools to be developed is a "handshake" data exchange to help align plans to add EV chargers with the grid's hosting capacity.

EPRI launches 3-year initiative to address grid constraints, develop tools to serve coming EV loads | Utility Dive [utilitydive.com]

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Timeline of Early Efforts and Quick Wins

EVs2Scale 2030

OCT-DEC 2022	JAN 2023	FEB	MAR	APR	MAY	JUN

OEM and Fleet Operator NDAs and Data Agreements

50-state roadmap to 2030 outlining EV loads, charging needs, grid impacts, leadtimes, workforce needs, costs

GridFAST – grid interconnect online data exchange tool development

APL (VPL)
Vetted Product List for EVSE (for utilities, NEVI, state DOTs)

Benchmark EV Charging Reliability
Root causes, maintenance, training, costs (role of utilities)

Regulatory/Board
OEM/Fleet LOS for anticipatory load investment

Key Events

- **Advisory Board (3/10)**
- 3-20 **Utility Mtg Kickoff**
- 5/2 **Utility Mtg**
- **Utility-OEM-Fleet Forum (5/18)**
- **Advisory Board 6/29**
- 6/6 **Utility Mtg**

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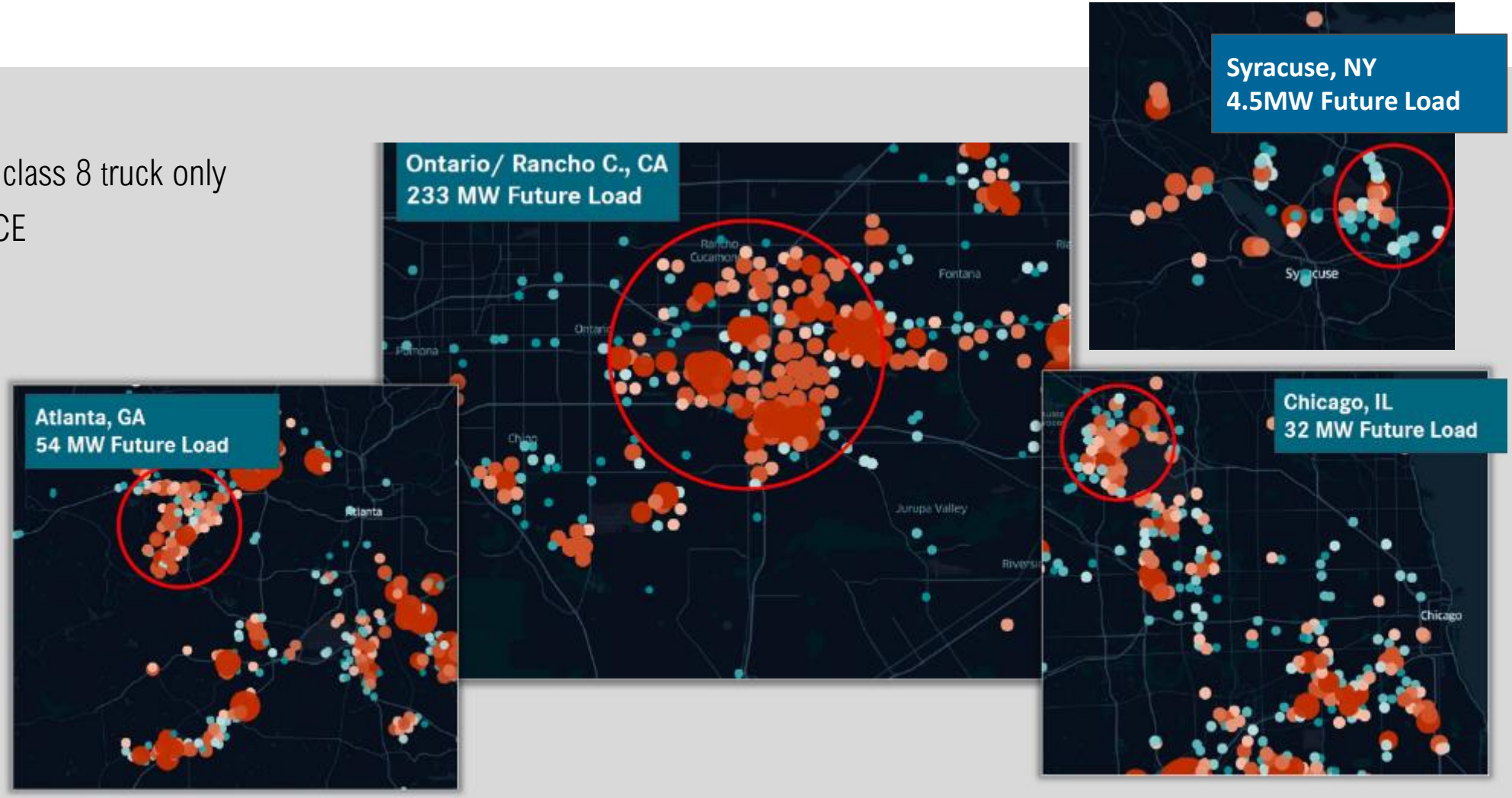
Daimler Truck HD Projected Future Load “Clusters”

- Daimler heavy-duty class 8 truck only
- Currently on-road ICE
- Telematics data



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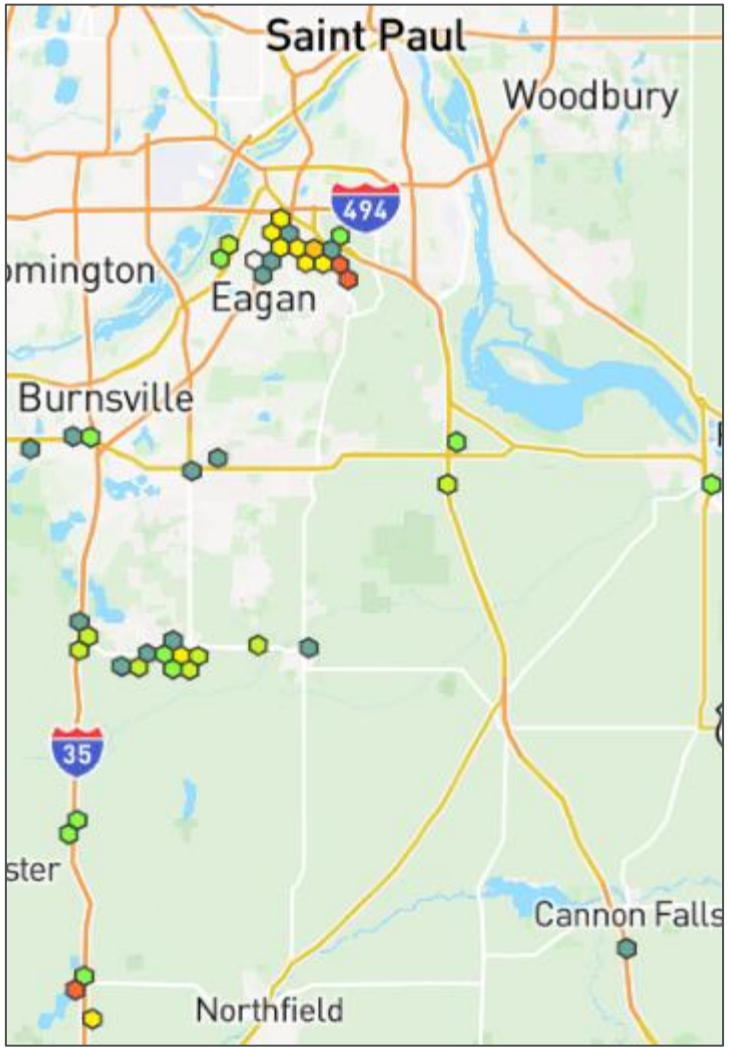
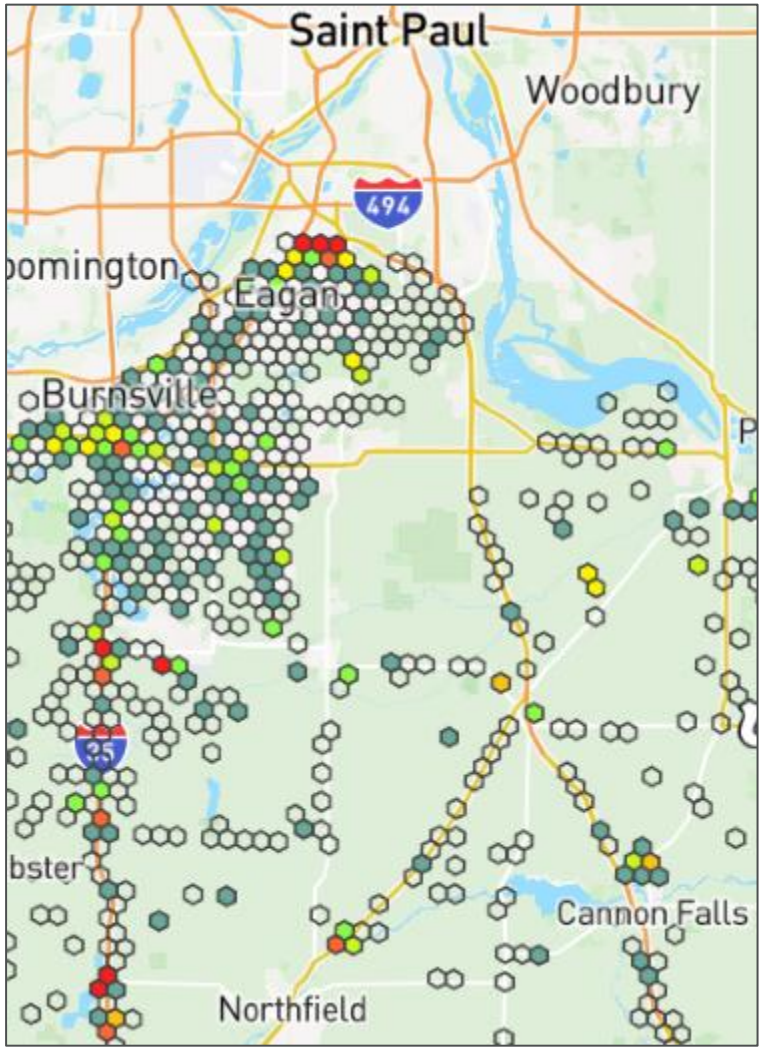
DAIMLER – CLASS 8



INRIX – CLASS 3-8 (7-10% of vehicle fleet)



Daily energy

- 0.0-0.1 MWh
- 0.1-0.3 MWh
- 0.3-0.5 MWh
- 0.5-1.0 MWh
- 1.0-2.0 MWh
- 2.0-3.0 MWh
- 3.0-5.0 MWh
- 5.0 MWh+

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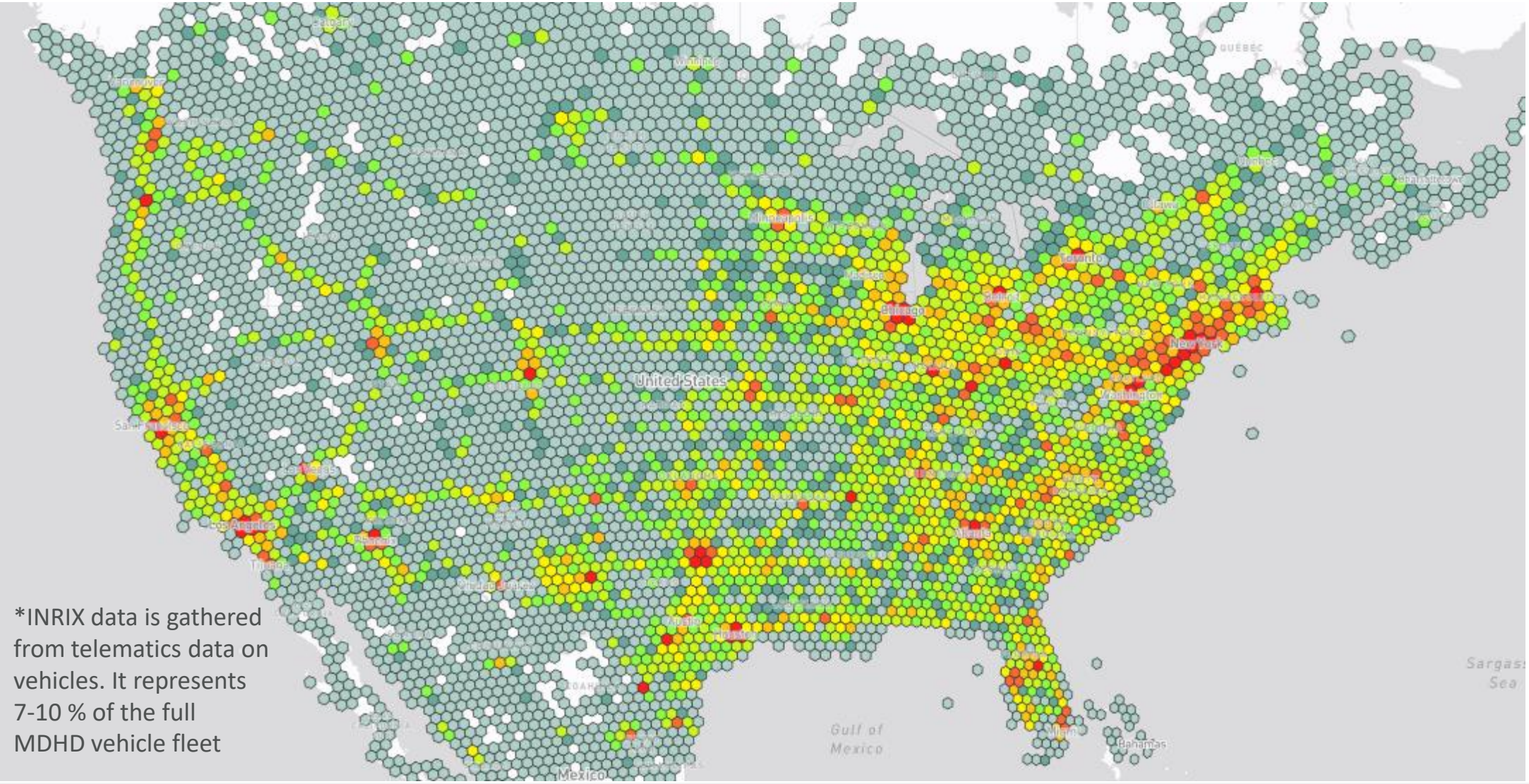
Preliminary Vehicle Activity: MDHD Vehicles



Hex level **4**

INRIX (MDHD) + Daimler + Volvo

Avg # of stops per day

- < 300
- 300-500
- 1,000 - 3,000
- 3,000 - 5,000
- 5,000 - 10,000
- 10,000 – 20,000
- 20,000+

*INRIX data is gathered from telematics data on vehicles. It represents 7-10 % of the full MDHD vehicle fleet

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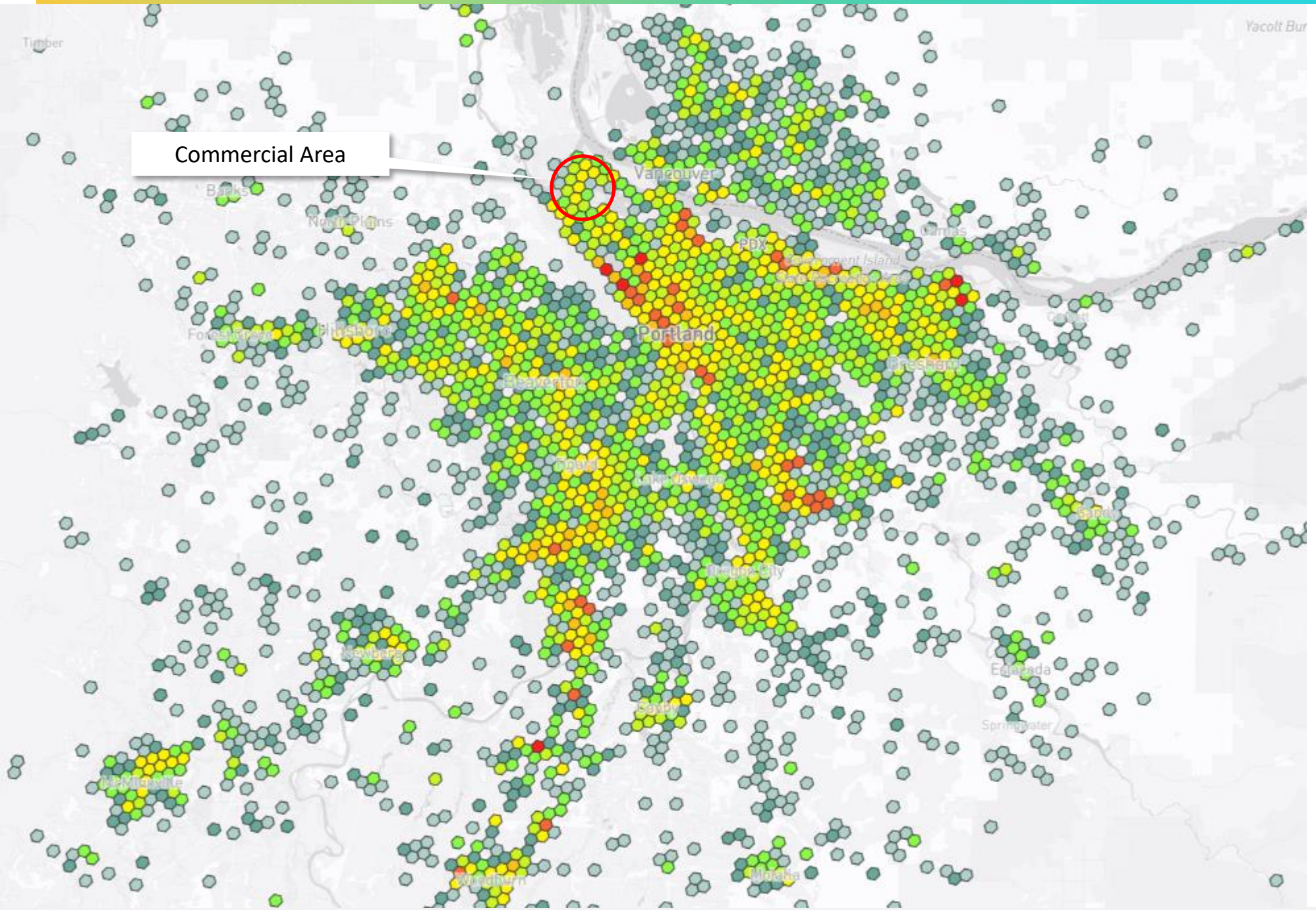

EVs2Scale 2030

Portland

Hex level **8**

INRIX – Avg # of Stops per day

- < 0.1
- 0.1-0.2
- 0.2-0.5
- 0.5-1.0
- 1.0-3.0
- 3.0-5.0
- 5.0-10.0
- 10.0 +

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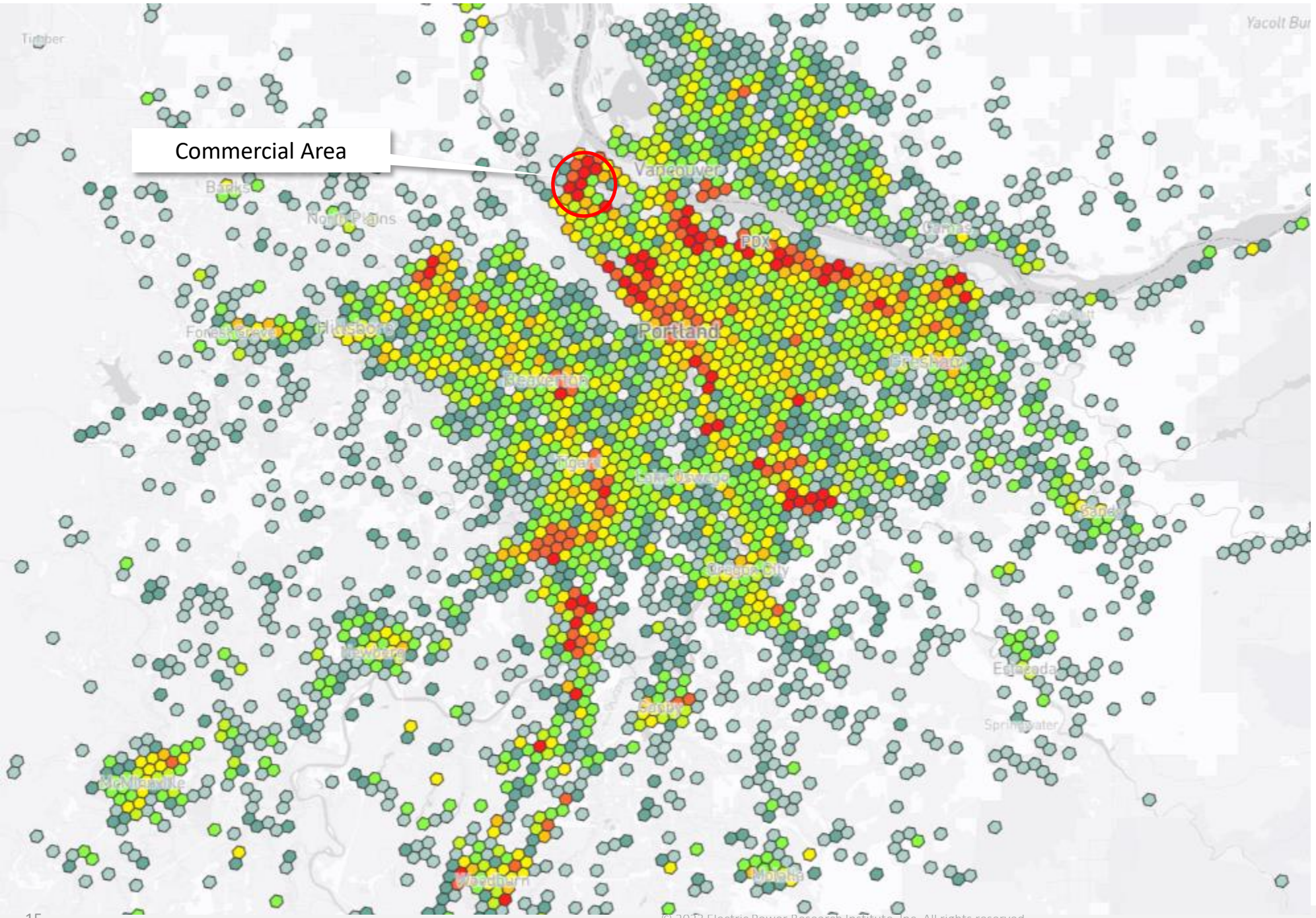

EVs2Scale 2030

Hex level 8

INRIX + Daimler + Volvo:
Avg # stops per day

- < 0.1
- 0.1-0.2
- 0.2-0.5
- 0.5-1.0
- 1.0-3.0
- 3.0-5.0
- 5.0-10.0
- 10.0 +

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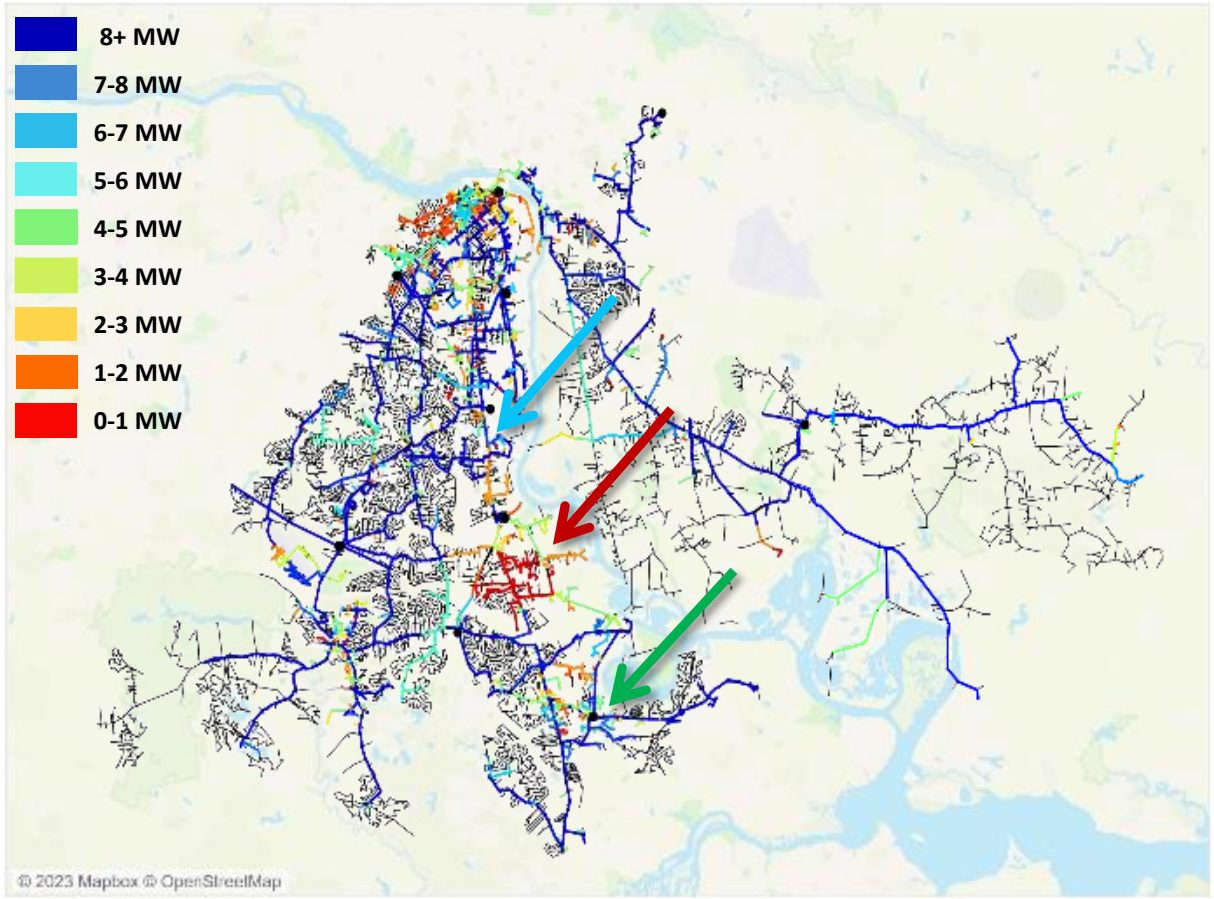
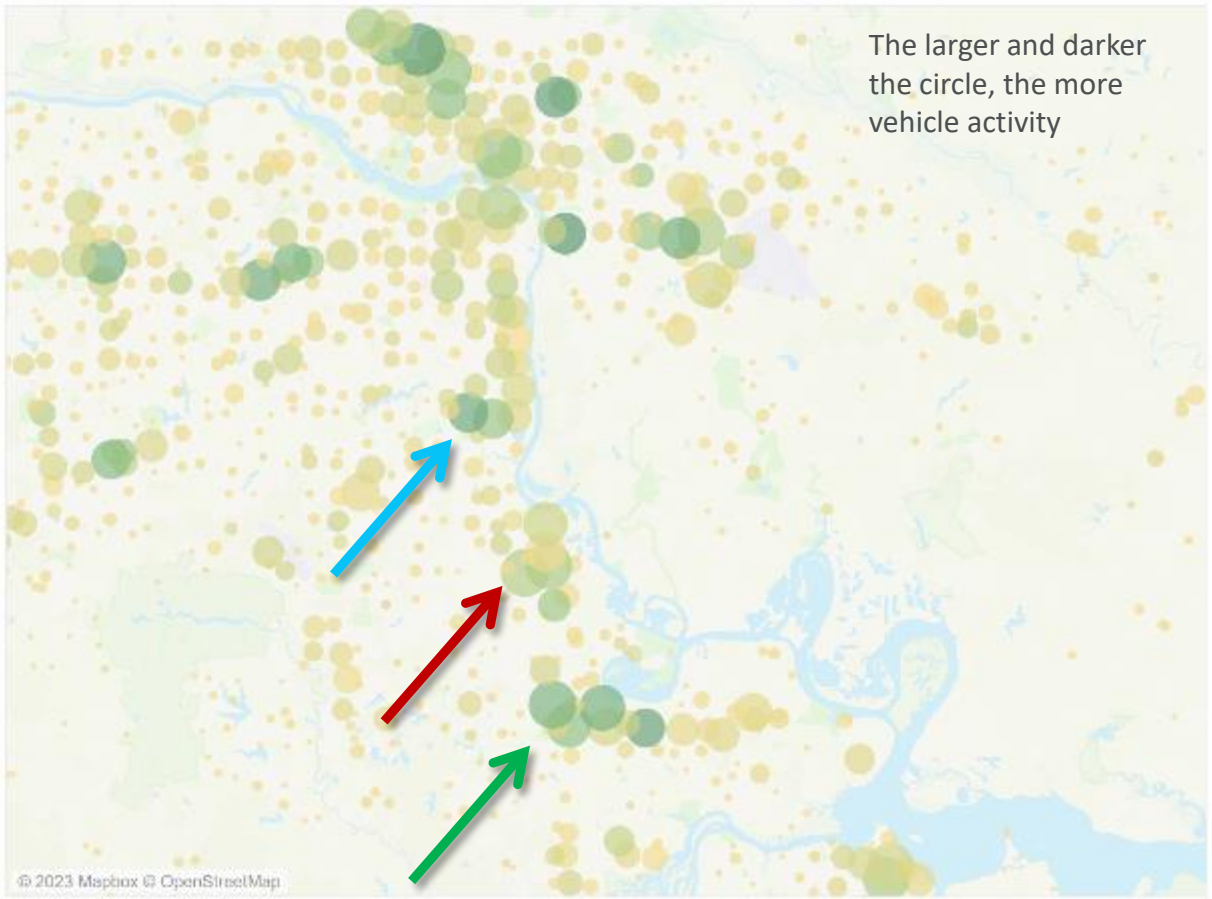
What might capacity look like?



Hosting Capacity for new load



Fleet Activity

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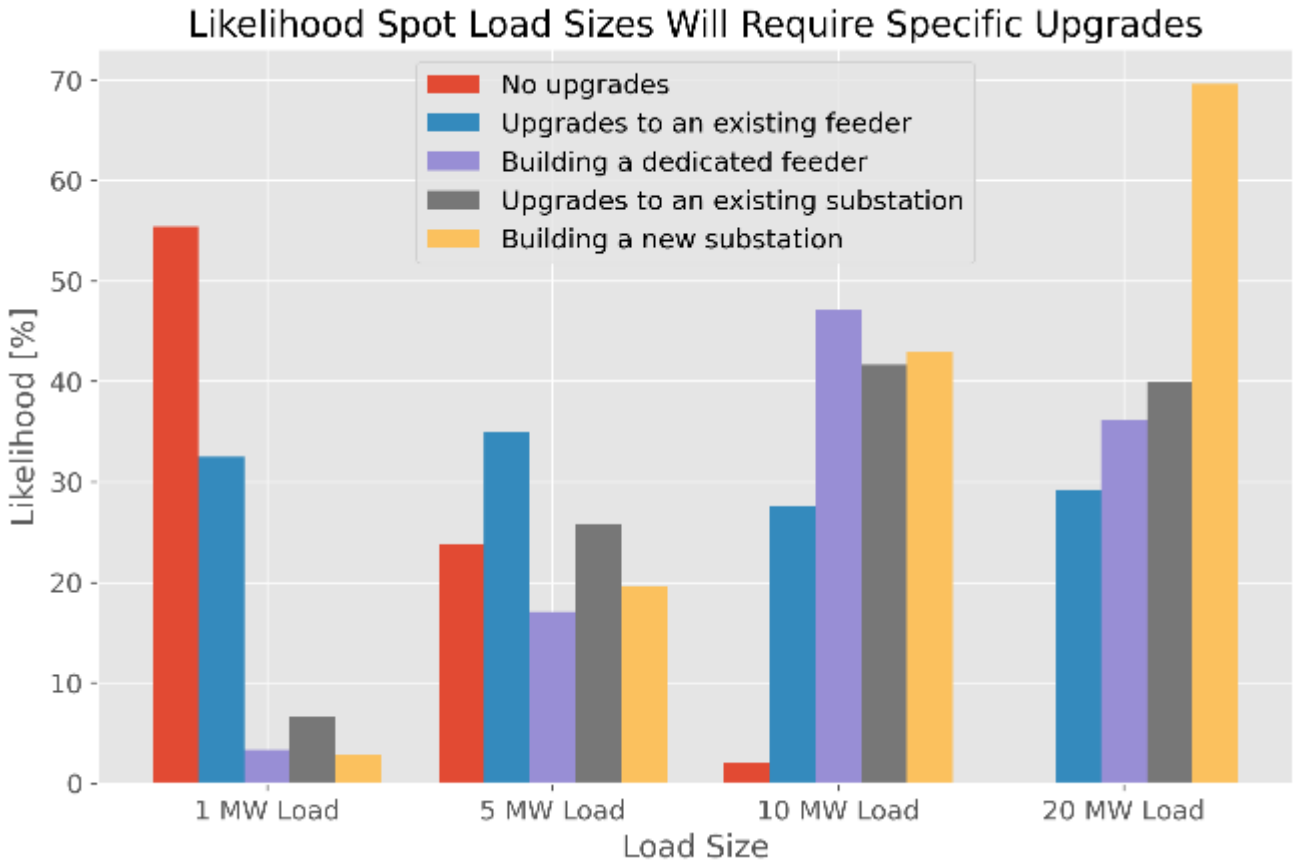
Utility Grid Survey

Preliminary Responses



Preliminary Take-Aways:

- ***5MW load*** – 30% likely to need a feeder up grade
- ***10MW load*** – 48% likely to need a dedicated feeder, 42% likely to need substation
- ***20MW load*** – 70% likely to need a new substation

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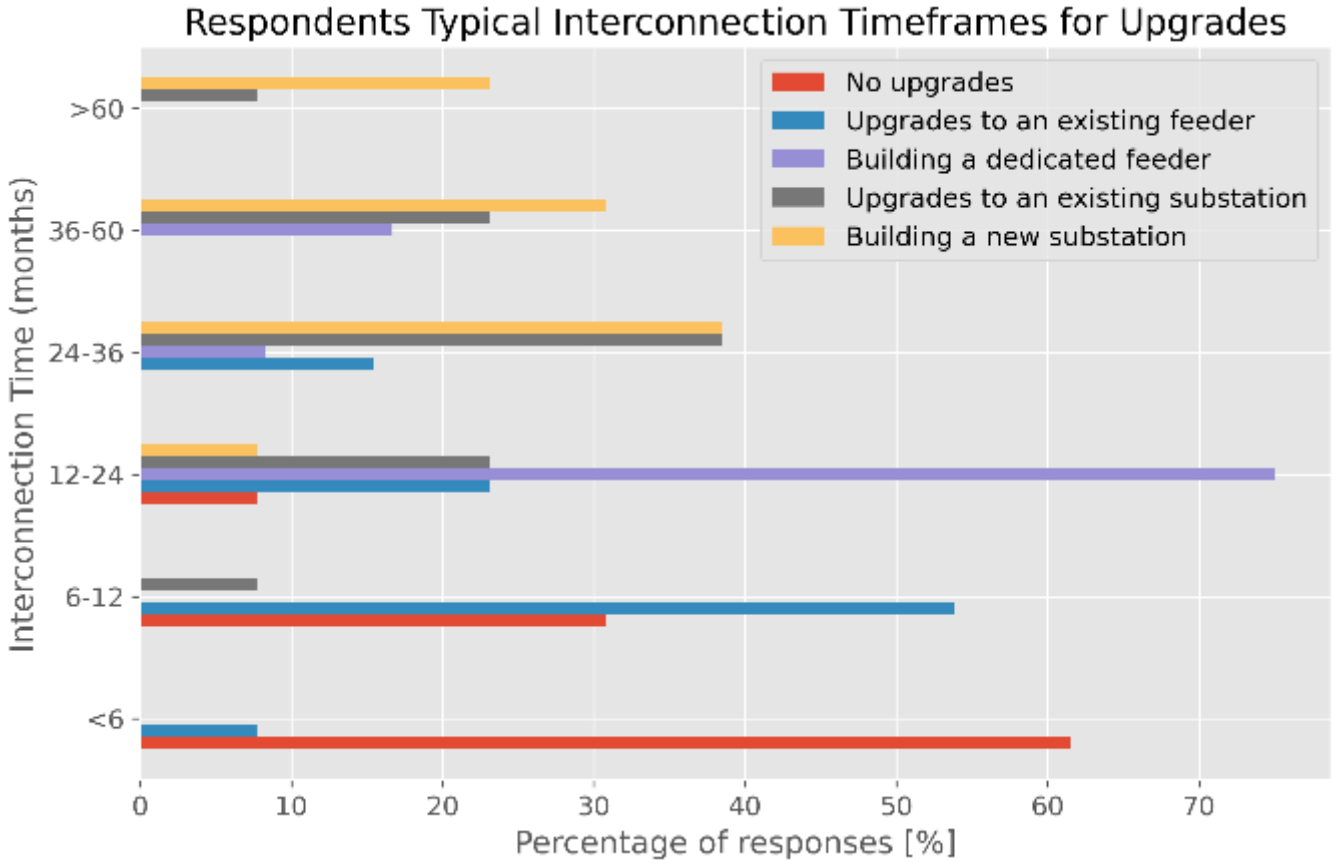
Utility Grid Survey

Preliminary Responses



Preliminary Take-Aways:

- ***Upgrades to an Existing Feeder:*** 6-12 months
- ***Dedicated Feeder Lead Time:*** 12-24 months
- ***Build a new Substation:*** 24-36 months

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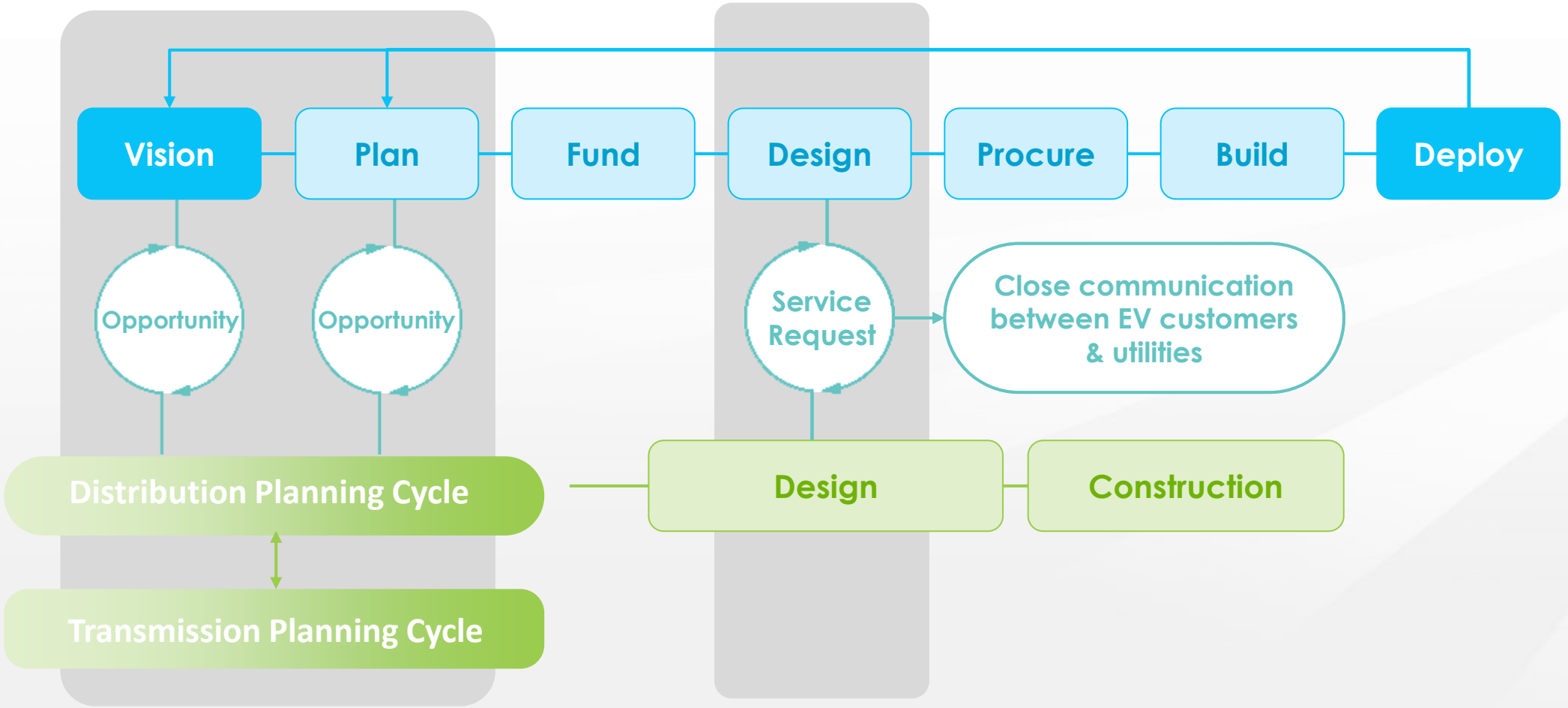
How might we help EV customers and utilities get ***actionable*** information, ***earlier*** in this process?



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GridFAST

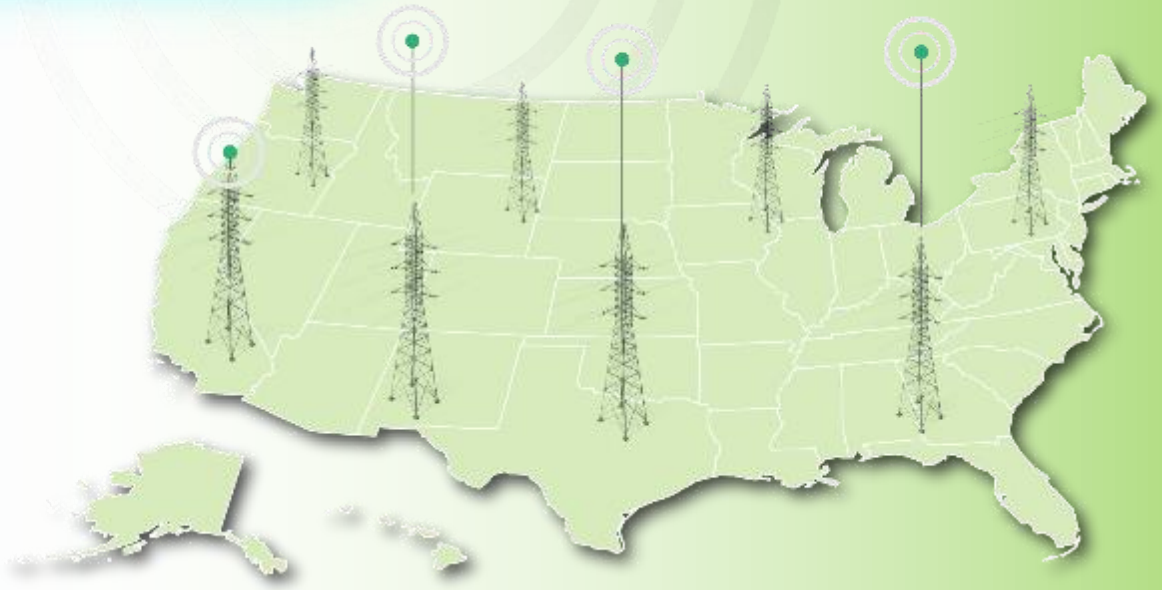
EVs2Scale 2030

Improve transparency in EV charging planning to inform grid investments and accelerate grid interconnects

2023-2035 plans defining loads, locations, timing

GridFAST
Secure online data exchange platform

Utility hosting capacity – or proxies – indicating grid readiness, timing to support EV charging loads



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GridFAST Interviews To Date

EVs2Scale 2030

Interviews and Journey-Mapping being Conducted by Smart Design

amazon

electrify america

Xcel Energy

US. FOODS

PENSKE
Rental | Leasing | Logistics

AUSTIN ENERGY

ENTERPRISE HOLDINGS
Alamo
enterprise
National

TESLA

Walmart
Save money. Live better.

PITT OHIO
SUPPLY CHAIN • GROUND • LTL • TL

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Thank You

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