Charging up Rural Iowa

EV and Charging Infrastructure Planning in Rural Northeast Iowa

Michelle Barness, Senior Regional Planner
Aaron Detter, AICP, Planning Department Head

upper explorerland
regional planning commission

Topics

- Why EV planning matters to rural communities
- NE Iowa's regional EV collaboration
- Rural charging infrastructure planning
- Rural EV strategies

Why EVs Matter to Rural Communities

Photo Credits: The Gazette, Mutual Benefits Group

Communitywide economic impacts

Respond to Shifting Travel Needs

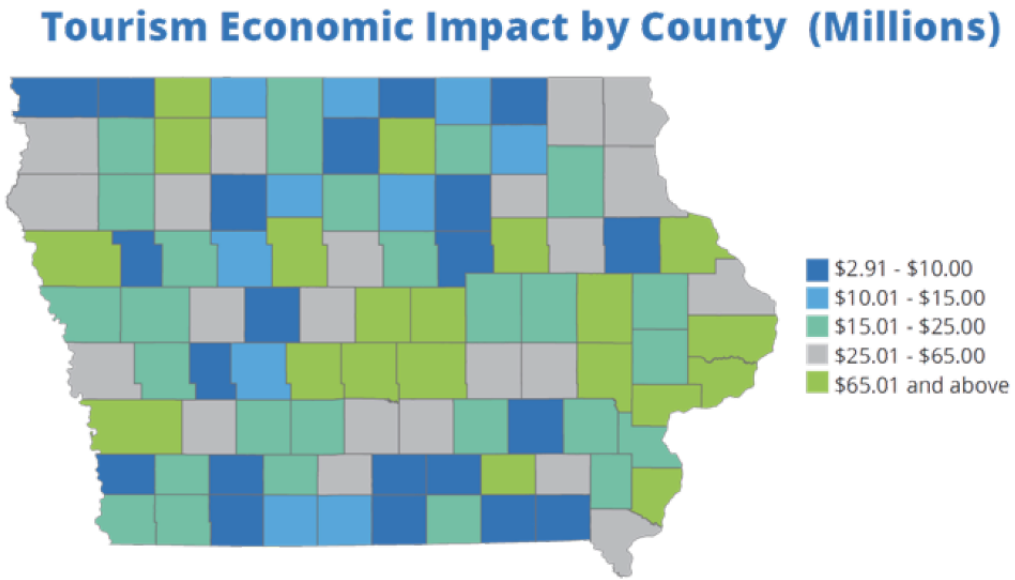
As more travelers use EVs it's crucial to have sufficient charging to meet demand, or they will likely avoid your area.

Encourage Economic Activity

Retailers see increased revenue when they provide access to EV chargers. EV drivers have increased dwell times when charging, and 70% patronize local businesses when using Level 2s.

EVs and Tourism

100% of tourism stakeholders that responded to a NEI RC&D survey agreed that EV charging is crucial to tourism growth. Regions have benefitted from marketing themselves as EV Friendly Destinations.



Breweries & Wineries
Plug & Pinot, Oregon

Downtown Districts

Parks & Recreation

(Source: Northeast Iowa RC&D, "Electric Vehicle Tourism Study," 2022)

Reduce transportation burden for residents

EV Maintenance Costs

EVs don't have a conventional engine, they have fewer fluids, and their battery, motor, and electronics require less maintenance.

EV Fuel Costs

EVs use fuel more efficiently and fueling with electricity costs less (especially with renewable energy).

EV Cost of Ownership

Accounting for fuel, maintenance/repair, insurance, fees, taxes, and finance charges, the avg. cost of ownership for an EV is $2,410 less/yr. than an ICE.

Table 8: Estimated Annual Cost of EV Ownership

Type of Cost	2022 Nissan Leaf	2022 Tesla Model 3	Average
Fuel	$651	$556	$603
Maintenance/repair	$855	$981	$918
Insurance	$1,081	$1,454	$1,267
Fees and taxes	$(88)	$494	$203
Finance charge	$918	$1,879	$1,399
Total	$3,417	$5,364	$4,391

Sources: AAA, Edmunds

Assumptions: 15K miles per year, electricity price of 0.147 per kWh, and a 55/45% city to highway driving ratio

EV

Table 9: Estimated Annual Cost of ICEV Ownership

Type of Cost	2019 Ford F-150	2019 Toyota Camry	Average
Fuel	$2,501	$1,665	$2,083
Maintenance/repair	$2,210	$2,194	$2,202
Insurance	$1,005	$1,109	$1,007
Fees and taxes	$701	$497	$599
Finance charge	$1,057	$763	$910
Total	$7,474	$6,129	$6,801

Sources: AAA, Edmunds

Assumptions: 15K miles per year, gas price of $3.29 per gallon, and a 55/45% city to highway driving ratio

Internal Combustion Engine (ICE)

(Source: Steve Holland, Luther College Professor of Economics, "Economic Impacts of an Electric Vehicle Charging Network," 2023)

Health & environmental benefits

Clean Transportation

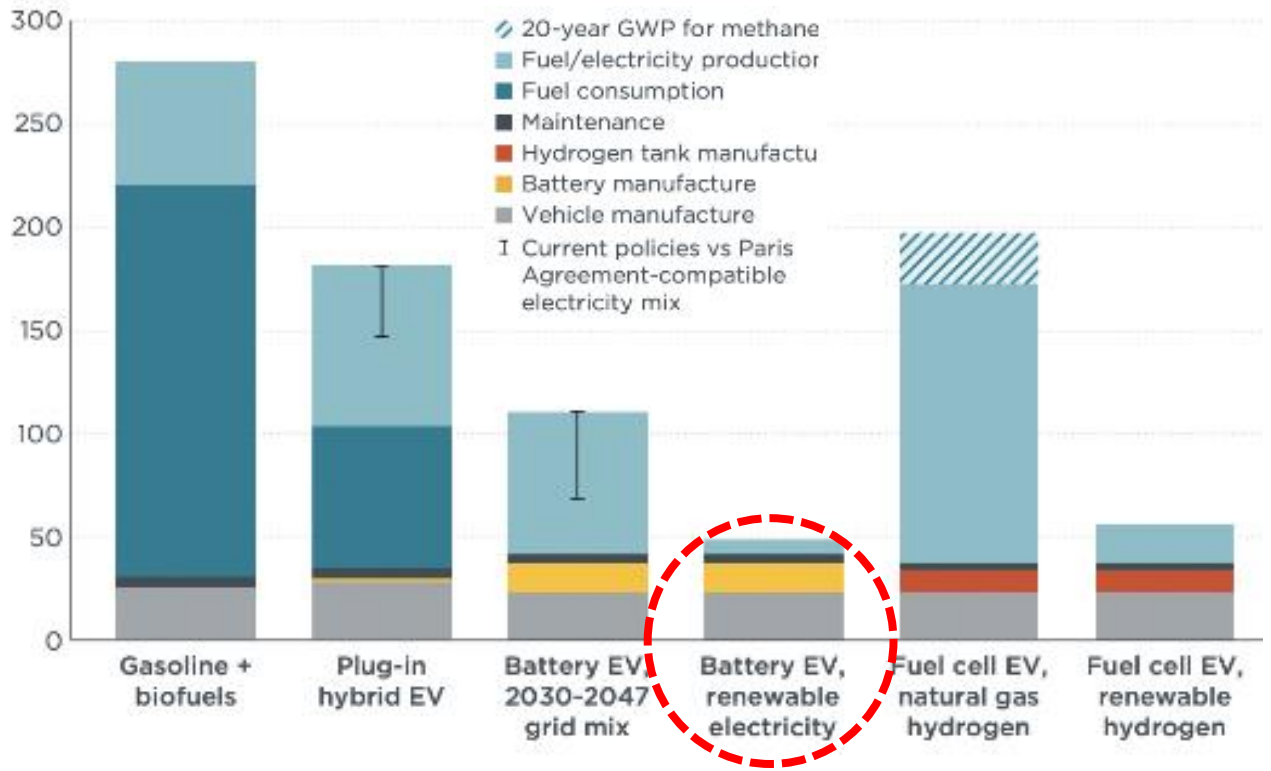
Transportation is the largest source of air pollution. EVs have emission-less propulsion, and with renewable electricity, they can reduce emission impacts during fuel production as well.

Cleaner Air = Healthier People

EVs don't emit tailpipe pollutants known to reduce air quality and impact our lives. Switching to 100% EVs and a clean electricity grid could save Iowa $9.3 billion in public health costs.

(Source: American Lung Association)

Global comparison of life-cycle greenhouse gas emissions of combustion engine and electric passenger cars



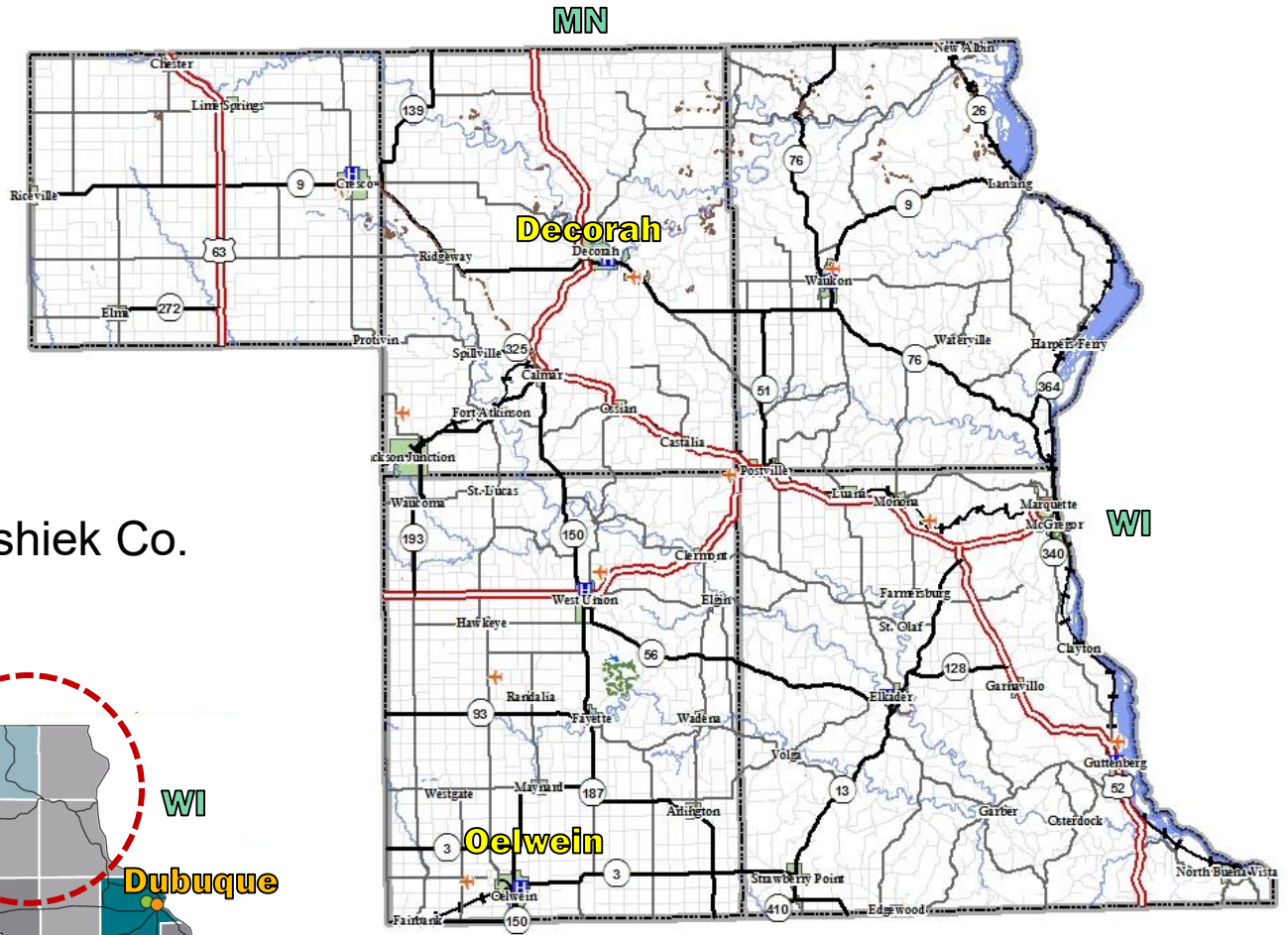
(Source: International Council on Clean Transportation, 2024)

NE Iowa's Regional EV Collaboration

Photo Credits: Wander Wisdom; Trails and Tales

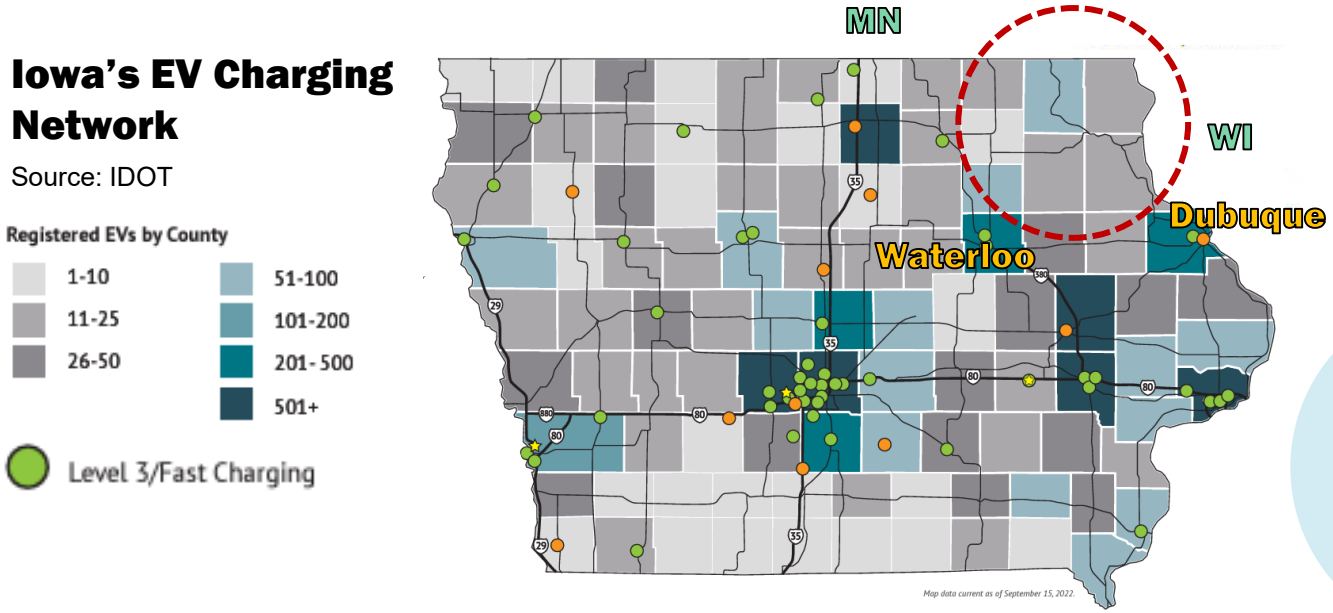
5-County Rural Region

Allamakee, Clayton, Fayette, Howard & Winneshiek Co.



Iowa's EV Charging Network

Source: IDOT



Total Pop.
80,729

Largest City (Decorah)
7,587

50 cities

Driftless Region
Waterways, hills

Major Industries
Ed., Healthcare, Manufacturing, Retail

No interstates

U.S. Highways:
52, 63, 18

State Highways:
Multiple (black)

Driving Electric in Rural NE Iowa: An Analysis, Planning, Workforce & Major Employer Partnership

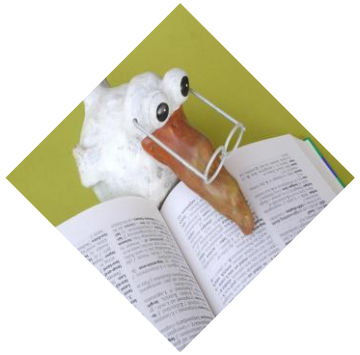
Funders

- IEDA Iowa Energy Office
- NEIFN Community Foundation
- Dairyland Power Co-op
- Transportation Planning: FHA SPR, FHA STBG, FTA 5311

Partners

- Upper Explorerland Regional Planning Commission (UERPC)
- Winneshiek Energy District
- Luther College
- Northeast Iowa Community College
- Northeast Iowa Resource Conservation & Development

Project Goals



Study

Identify needs & opportunities for EV buildout through charging infrastructure, tourism & economic impact studies.

Planning & Engagement

Engage stakeholders through EV outreach & events, and charging corridor planning & development

Tech Assistance, Projects

Jump-start workforce & public charging through technical assistance to employers & communities

Training

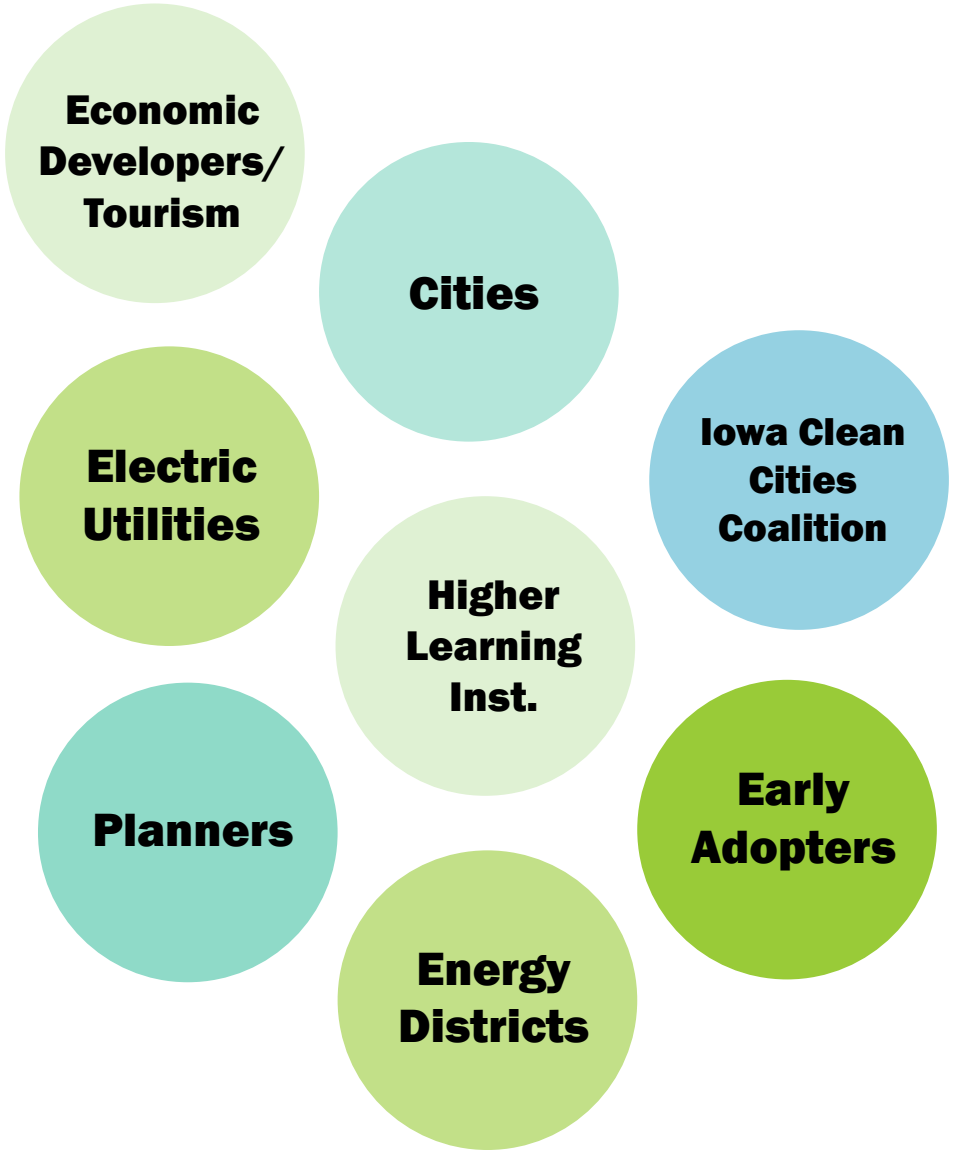
Develop community college training for EVs & charging infrastructure

upper explorerland regional planning commission

Stakeholder Engagement:

Regional EV Workgroup

- Review info. on EV and charging
- Guest speakers and knowledge experts
- Economic and tourism impacts
- EV resources and funding opportunities
- County and city-level EV engagement
- Regional EV event
- Regional EV strategies
- Regional charging plan



upper explorerland regional planning commission + EV Workgroup

Stakeholder Engagement:

"Get Charged Up" Regional EV Event

- **Panel discussions**:
  - **Community Perspectives**
  - **EV Fleets**
  - **Charging Infrastructure**
  - **Funding and Assistance**
- **Networking**
- **Vendors**
- **EV Exhibit** and **"Ride-and-Drive"**

County Economic Development + Energy Districts

Stakeholder Engagement:

Local EV Events

- **Educate about EVs and charging infrastructure**
- **Stories about early adopters**
- **Information on Regional EV Workgroup and charging infrastructure planning**

Clayton Co. Earth Day EV Event

Winneshiek Co. Earth Day Festival

Cresco Charger Ribbon Cutting

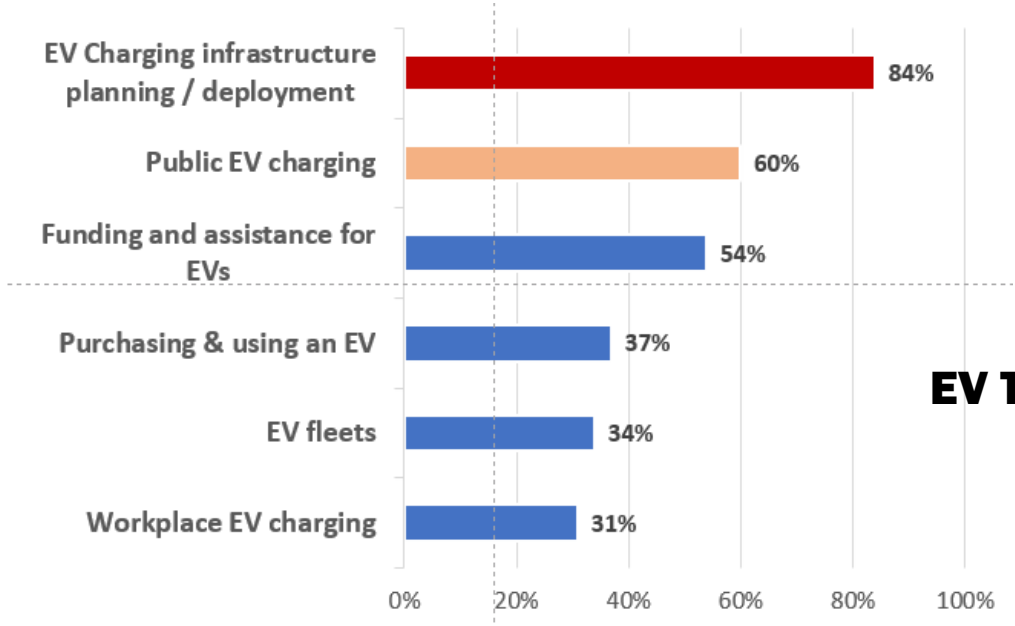
Decorah Farmer's Market

upper explorerland regional planning commission

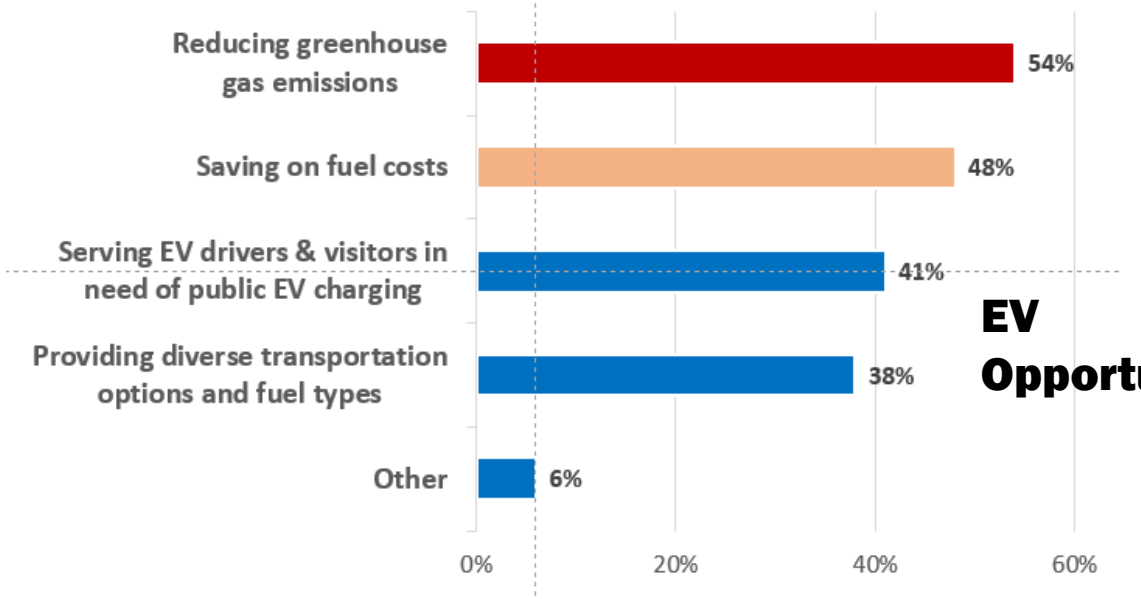
Stakeholder Engagement:

Community Survey

- Taken by Regional EV Event Registrants
- Which EV topics are people interested in?
- Do they drive an EV?
- What is greatest opportunity with EVs?
- What are biggest EV issues or questions?



EV Topics



EV Opportunities

Tech Assistance:

Workforce & Community Charger Implementation

- **Assistance to employers & communities for charger implementation**: power costs & impacts, install options, code compliance, inspection, permitting etc.
- Engage employers and employees in beneficial opportunities for EV commuting
- Funding options for chargers

6 Cities engaged in charger TA

18 Employers engaged in charger TA

12 Entities put Level 2 chargers in

Level 2 Charger Funding:

Community Foundations
VW Settlement
Employer and city match

NORTHEAST IOWA COMMUNITY COLLEGE

EV Training:

- Train auto faculty on EVs
- Expand for-credit EV curriculum
- Assess need for and/or develop non-credit EV servicing, safety and supply equipment training

Image Sources: Toronto Star (above); National Alternative Fuels Training Consortium

Findings = **High interest in EV safety training**

Findings = **Expand for-credit EV auto training**

Findings = **Demand for non-credit/community-based EV auto training slower in rural areas**

Findings = **Engagement/ed. of auto services & dealers needed**

NORTHEAST IOWA RC&D

Studies:

NE Iowa EV Tourism Study

- Research EV tourism in the U.S. and Iowa
- Provide examples of EV tourism implementation
- Review EV tourism opportunities / barriers
- Make recommendations on EV Education, Marketing & Charging Infrastructure related to tourism goals

Lack of chargers = deter EV travelers

Chargers available = +economic impacts

Capitalize on EV travel: "EV-friendly destinations"

Priority = Chargers near downtowns.

Priority = Chargers where people lodge.

Priority = Chargers at park & rec sites.

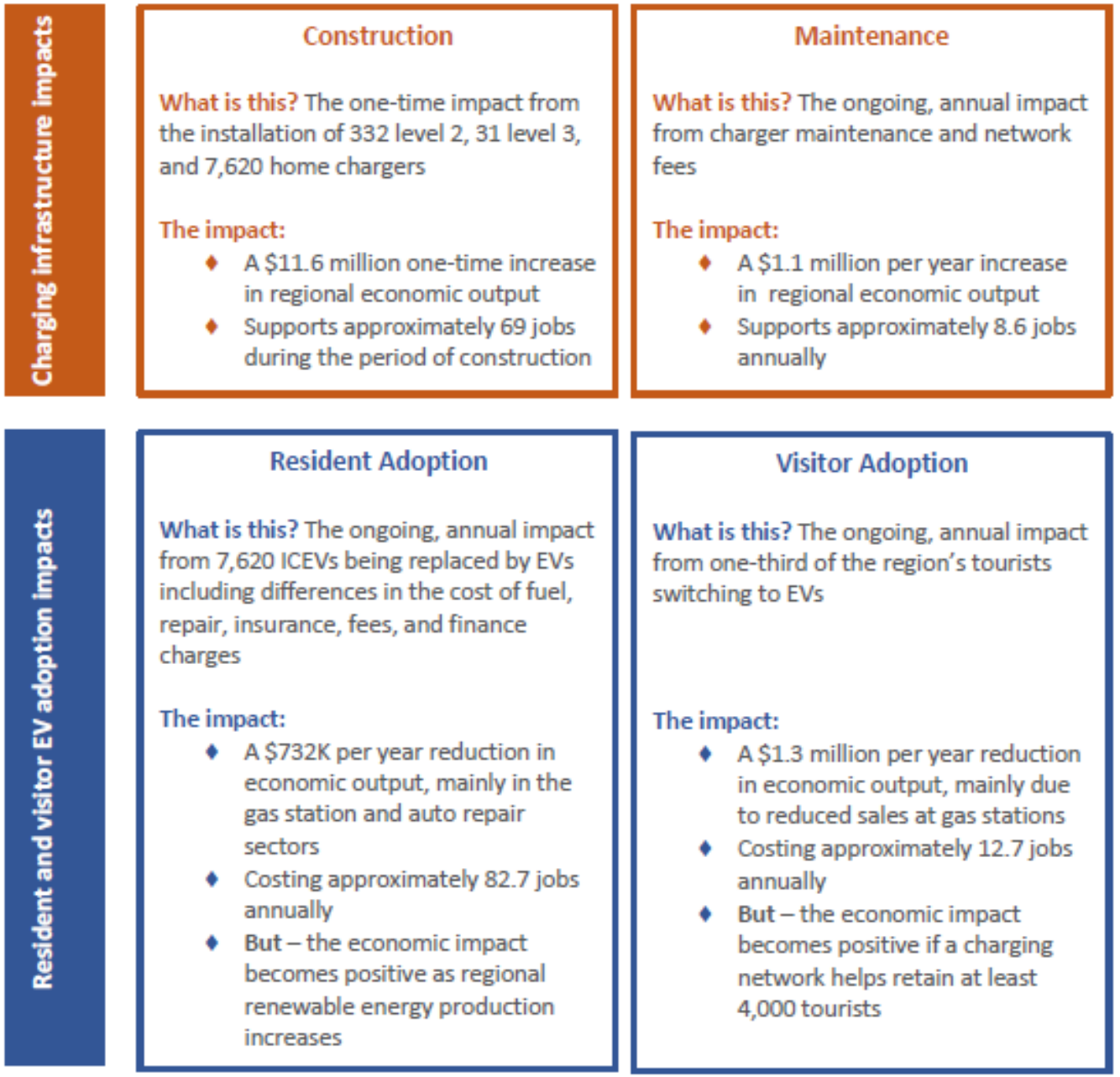
Priority = Chargers at private businesses.

LUTHER COLLEGE

Studies:

Charging Network Economic Impact Analysis

- **Identify economic impact of EV charging network in the Northeast Iowa region.**
  - **(1) charging station construction,**
  - **(2) maintenance,**
  - **(3) EV adoption by area residents,**
  - **(4) EV adoption by visitors to the region.**



upper explorerland regional planning commission

Studies:

NE Iowa EV and Charging Infrastructure Plan

- Outcomes of regional project
- Info. on EVs and charging infrastructure
- Charging demand for region
- Charging plan
- Regional EV goals & strategies
- EV Resources

upper explorerland regional planning commission + EV Workgroup

Rural Charging Infrastructure Planning

Photo Credits: Wander Wisdom; Trails and Tales

Picturing Rural EV Buildout

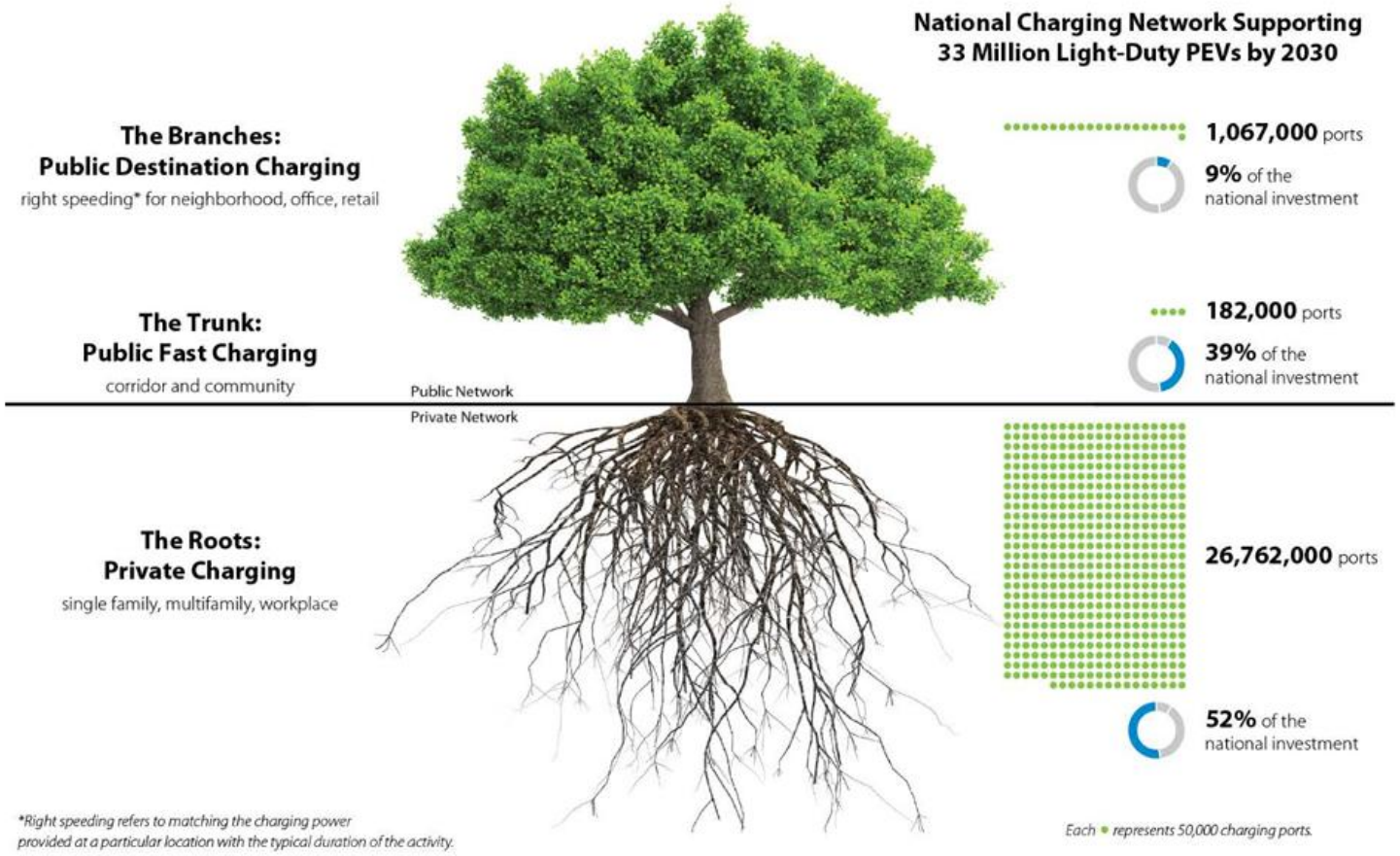
Est. EV drivers in 2030: Joint Office of Energy & Transportation EV adoption projections for cities/areas

Est. EV drivers in 2040: Regional share of IDOT's statewide adoption projection (apply region's current % of EV drivers)

Medium EV adoption by 2040
(99% access to home charging, **6,570 EVs**)

- 42 Public Level 3/fast charging ports
- 319 Public Level 2 ports
- 6,290 Single family ports
- 117 Shared private ports

Illustration of Charging Infrastructure Needs in the U.S.



Source: National Renewable Energy Laboratory, "The 2030 National Charging Network," 2023

How challenging is buildout for rural areas?

- **42 Fast charging ports**
- **319 Public Level 2 ports**
- **6,290 Single family ports**
- **117 Shared private ports**

HARD: High costs, need federal/state incentives or big private investment, install harder (e.g. 3-phase)

DOABLE: Lower cost, charger rebates, small investment for cities / orgs / businesses, local grants

VERY DOABLE: Low cost, residential charger rebates, small investment for many

HARD-ish: Lower cost, but without local incentives or regs, developers / landlords may not invest

Estimates of Total Charger Project Cost

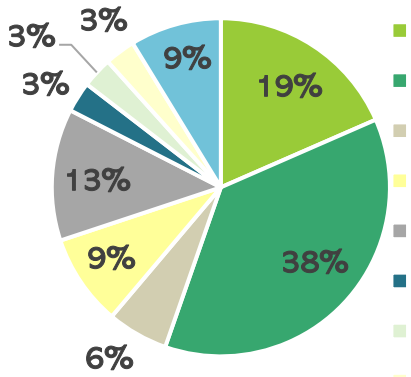
Level 2 Home	$500 - $4,000
Level 2 Public	$15,000 - $20,000
Level 3 (20 kW)	$15,000 - $30,000
Level 3 (50 kW)	$40,000 - $60,000
Level 3 (100 kW)	$60,000 - $80,000
Level 3 (150 kW)	$80,000 - $100,000
Level 3 (180+ kW)	>$100,000

Source: Alliant Energy, 2024

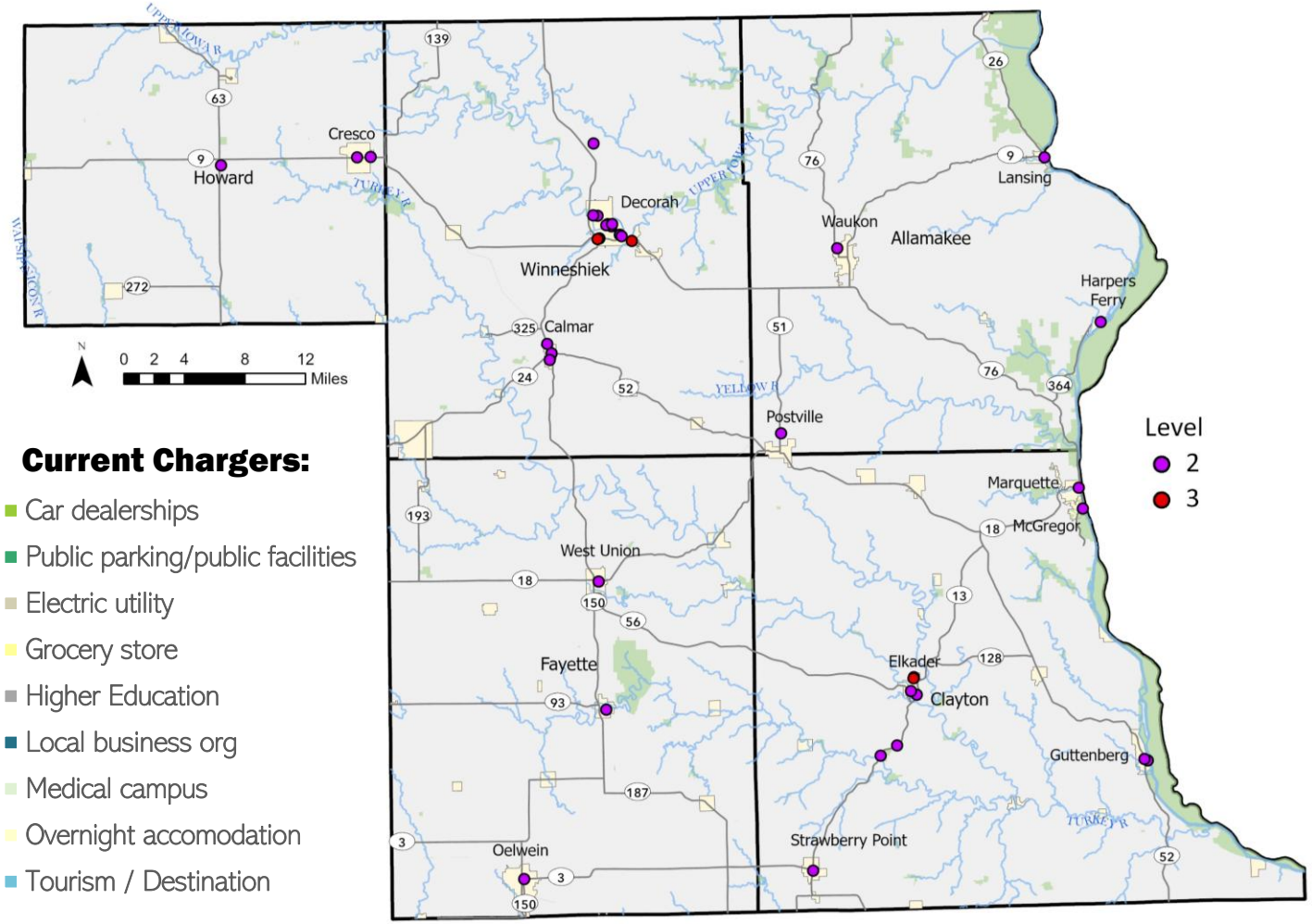
How is our rural area doing so far?

Characteristics of Public Charging in UERPC Region

- 91% of charging is available to the public
- 15 cities have public charging (30%)
- 94% of chargers are Level 2
- 85% of chargers require payment
- Fees are per kWh (avg. of $.33/kWh), per session, or per charge
- 78% of public chargers are open 24/7



***Level 2 public chargers are found every 25 miles or less throughout region**



Current Chargers:

- Car dealerships
- Public parking/public facilities
- Electric utility
- Grocery store
- Higher Education
- Local business org
- Medical campus
- Overnight accomodation
- Tourism / Destination

***There are around 67 charging ports (in 2022 there were 26, so the number has more than doubled over the course of the regional project)**

Future Deployment: Phase 1, Level 2 Public

Top public locations drawing visitors; overnight accommodations

- Cities over 500 with retail draw (downtown districts)
- Overnight accommodations
- Public campgrounds
- Public destinations (museums, park & recreation, etc.)
- Higher education institutions
- Hospitals

Fairfield Inn charger in Decorah, IA

Charger at Luther College in Decorah, IA

Charger in downtown West Union, IA

***Prioritizes ability to take local action, work with public partners, and meet visitor's needs**

Future Deployment: Phase 2, Level 2 Public

Top private destinations & accommodations; state/fed destinations; public facilities w/local draw

- Private campgrounds
- Breweries and wineries
- Grocery stores
- State or federal destinations
- Public high schools
- Public libraries

Fareway charger in Decorah

Charger at Textile Brewing, Independence

Charger at Independence High School

***Prioritizes charging to meet local demand, or charging projects that require working with non-public or hard to reach public partners**

Future Deployment: Phase 3, Level 3 Public

Highly visible and accessible public locations along highway corridors

- Along highways with high AADT
- Within 1 mile of highway
- Within 50 miles of other Level 3s
- Access to 3 phase power
- Key stops for travelers / commuters
- Open 24 hrs. or much of day
- Public restroom access
- Broadband / WiFi
- Existing vehicle fueling use

Level 3 at Hyvee, Waterloo, IA


Level 3 at Kwik Trip, Johnson Crk, WI

***Prioritizes charging to meet needs of travelers, and requires coordination with private businesses**

Regional EV Strategies

Pursue Opportunities for Positive Financial & Economic Impacts From EVs & Chargers

1) Chargers in downtowns to encourage shopping

2) Market region as EV-friendly destination

3) Engage in partnerships with funders

4) Share incentive information with stakeholders

Regional EV Strategies

Collaborate Regionally for Joint Projects, Shared Resources & Learnings, and Positive Results

1) Continue collaborations through Regional EV Workgroup

2) Incorporate EV readiness goals in local/regional planning

3) Track charger funding & share with partners

4) Work with utilities, cities, auto dealers on public chargers

Regional EV Strategies

Provide An Accessible & Reliable EV Charging Network

1) Pursue city-owned chargers in high traffic locations

2) Implement charging at prioritized public locations

3) Implement charging at prioritized private locations

4) Educate regarding charging needed for EV fleets

5) Buildout fast charging near highways, fill gaps in network

6) Plan make-ready infrastructure to support chargers

7) Work with partners to ensure distribution infrastructure

Regional EV Strategies

Grow NE Iowa EV market

1) Disseminate EV fleet resources to public entities

2) Disseminate EV fleet resources to private entities

3) Get EVs on State purchasing list for govts.

4) Implement workplace charging programs & increase employee awareness and use

Regional EV Strategies

Provide training, education, outreach & engagement regarding EVs and charging

1) Address EV safety training needs

2) Address EV maintenance training needs

3) Engage public through EV outreach and events

4) Provide ed. resources & assistance to private entities on EV use, charging, and fleets

5) Provide ed. resources & assistance to public entities on EV use, charging, and fleets

6) Create EV charger installation toolkit

7) Support to auto dealers regarding EVs & community charging

8) Disseminate city policies & practices for becoming EV-ready

Thank you.

Michelle Barness

Senior Regional Planner
(563) 419 – 6243
mbarness@uerpc.org

Aaron Detter, AICP

Planning Department Head
(563) 419 – 6126
adetter@uerpc.org