IPUA
souri Public Utility Alliance
SIERRA CLUB

Proposal For

Development of Missouri Statewide Highway Corridor DC-Fast Charging

Ameren Missouri

City Utilities
Connecting Our Community

Columbia Water & Light

Kansas City Regional Clean Cities

Empire District
A Liberty Utilities Company

KCP&L
energizing life

The Power of Kirkwood Electric

MPUA
Missouri Public Utility Alliance

NRDC

SIERRA CLUB

Best.Drive.EVer

- ***Environmental***
  - **Highly efficient**
  - **~50% less NOx - even with fossil based utilities**
  - **Getting Greener all the time – as utilities add renewables**
  - **Zero emissions at ground level**
- ***Economics***
  - **Less maintenance – simpler, less moving parts**
  - **Refueling cost ½ of petroleum**
  - **Reduced petroleum dependence**
  - **Off-peak charging and grid benefits**
- ***Driver Experience***
  - **Responsive, quiet, and powerful …** *Best.Drive.**EV**er*

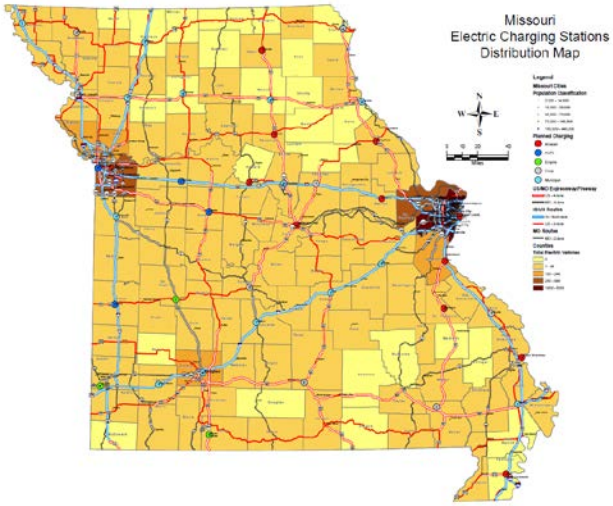
Long Distance Barrier

- ***Battery Technology and EVs are developing rapidly***
- ***"Breakthrough" EV will have 300 mile range for < $30,000***

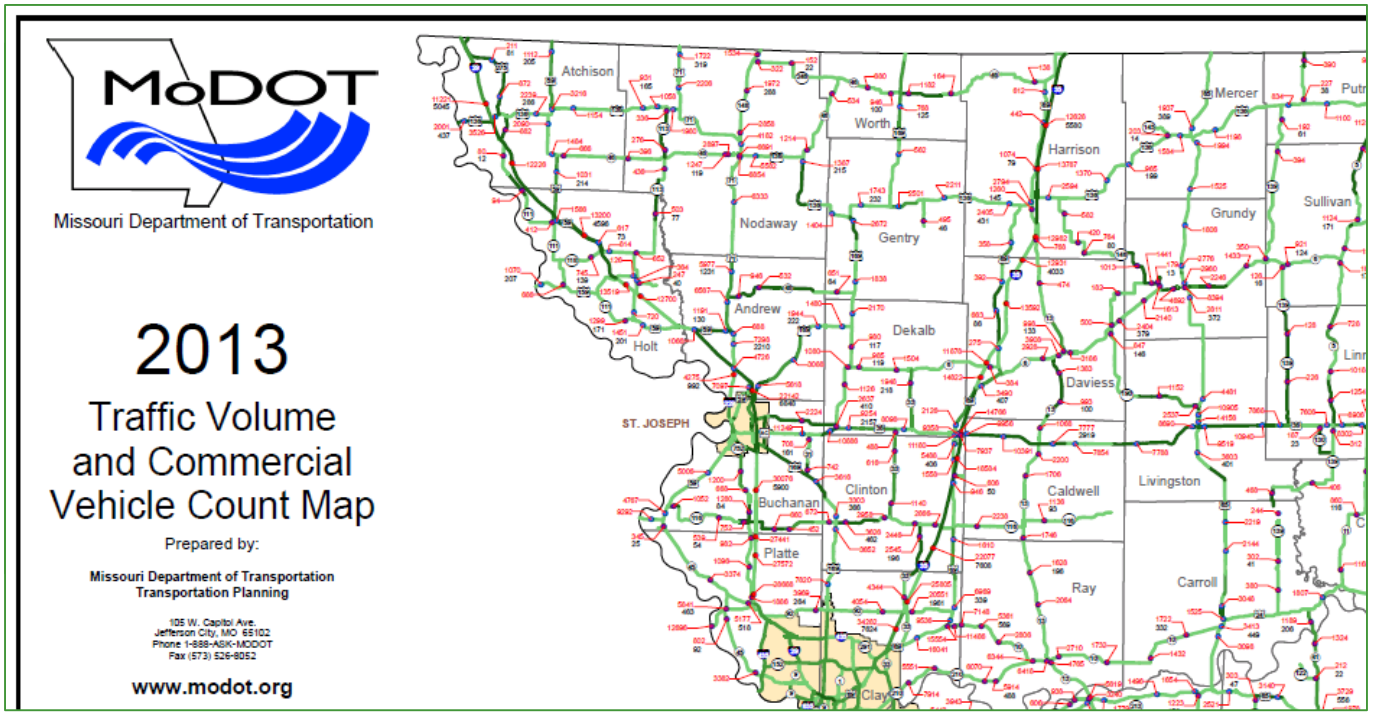
- **A primary remaining barrier will be long-distance charging**
- **DC fast charging is needed for quick refueling on corridors**

Proposed Charging Islands

- Statewide
- Minimum of 2 DCFC
  - 50kW or 150kW output
  - Both CHAdeMO and CCS Combo connectors
- Minimum 2 Level 2 ports having ~7kW AC output
- Credit card +
- Spacing ~25-75 miles apart
- In communities of population >2,000
- Near interstates or multilane highways
- Acquire "no cost easement"
- Within walking distance of amenities
- High reliability/availability



Charging Island Locations



Along Interstates	Priority 1
Along multi-lane highways having >10,000 daily trips	Priority 2
Along multi-lane highways having <10,000 daily trips	Priority 3

Populations >2,000

Spacing 25-75 miles

Proposed DCFC Islands

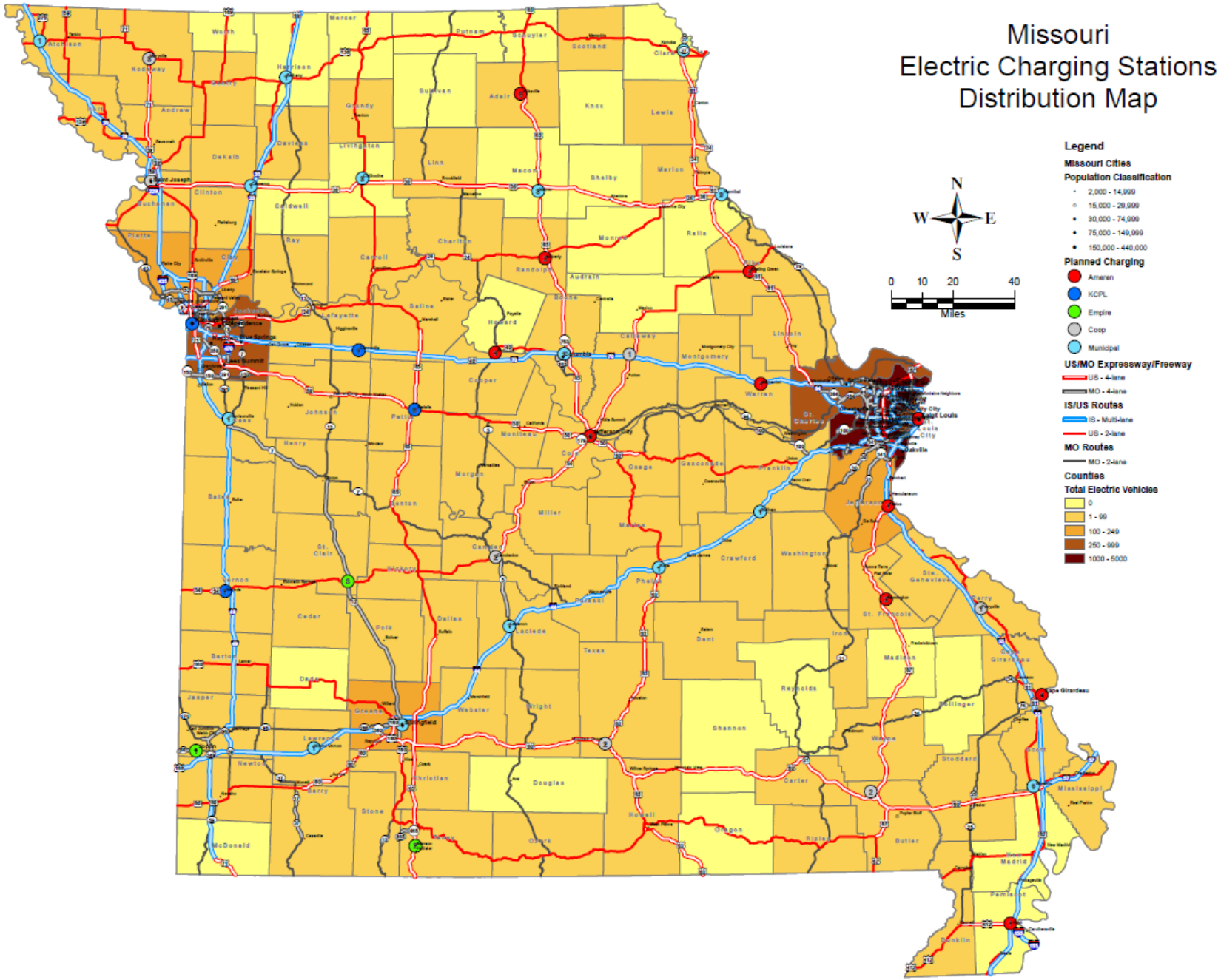
Priority 1	Interstates	24
Priority 2	Multi-lane "heavy“	10
Priority 3	Multi-lane "light"	6
		40

50kW $170,000 to $240,000 (150 miles range/hour)
150kW $270,000 to $360,000 (450 miles range/hour)

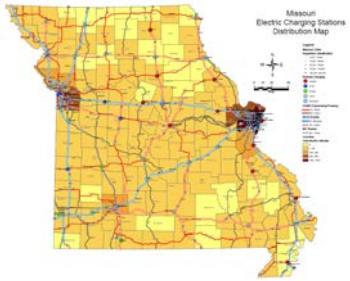
Total development cost of network: **$6.8M – $14.4M**

Factors

- Charging rate of equipment
- Line extension size and complexity
- Location of site
- Site development complexity


Missouri
Electric Charging Stations
Distribution Map
N
W
E
S
0 10 20 40
Miles
Legend
Missouri Cities
Population Classification
2,000 - 14,999
15,000 - 29,999
30,000 - 74,999
75,000 - 149,999
150,000 - 440,000
Planned Charging
Ameren
KCPL
Empire
Coop
Municipal
US/MO Expressway/Freeway
US - 4-lane
MO - 4-lane
IS/US Routes
IS - Multi-lane
US - 2-lane
MO Routes
MO - 2-lane
Counties
Total Electric Vehicles
0
1 - 99
100 - 249
250 - 999
1000 - 5000

Next Steps



Is the draft plan well-received? If so…..

Formalize expectations and establish APCP-approved oversight plan;

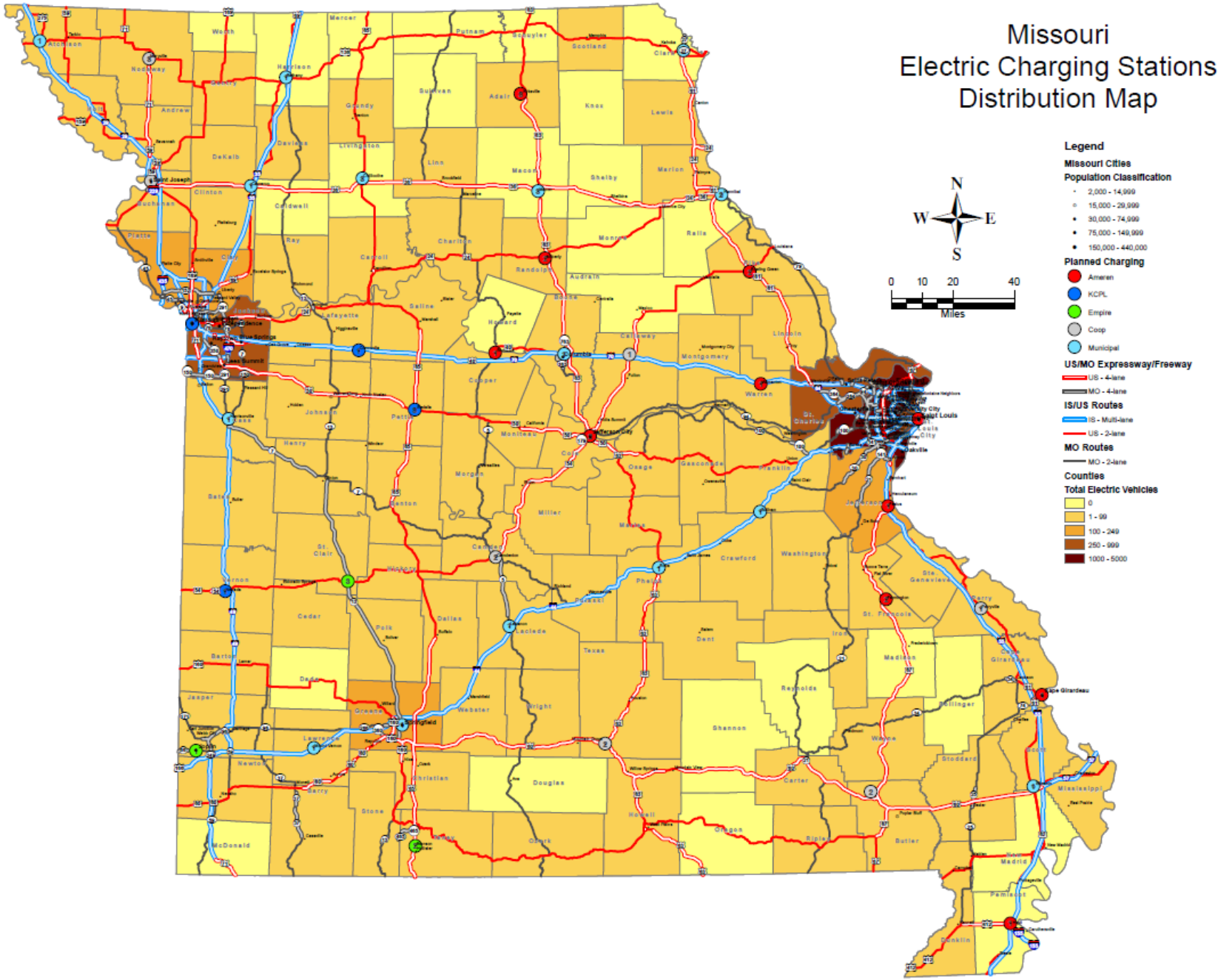
Identify specific locations and designate lead utilities for each site;

Determine funding distribution and cost-sharing;

Collaborate on sourcing materials, services, etc.;

Develop final plan with timeline for approval.

Detailed design	6-9 months
Construction	12-18 months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