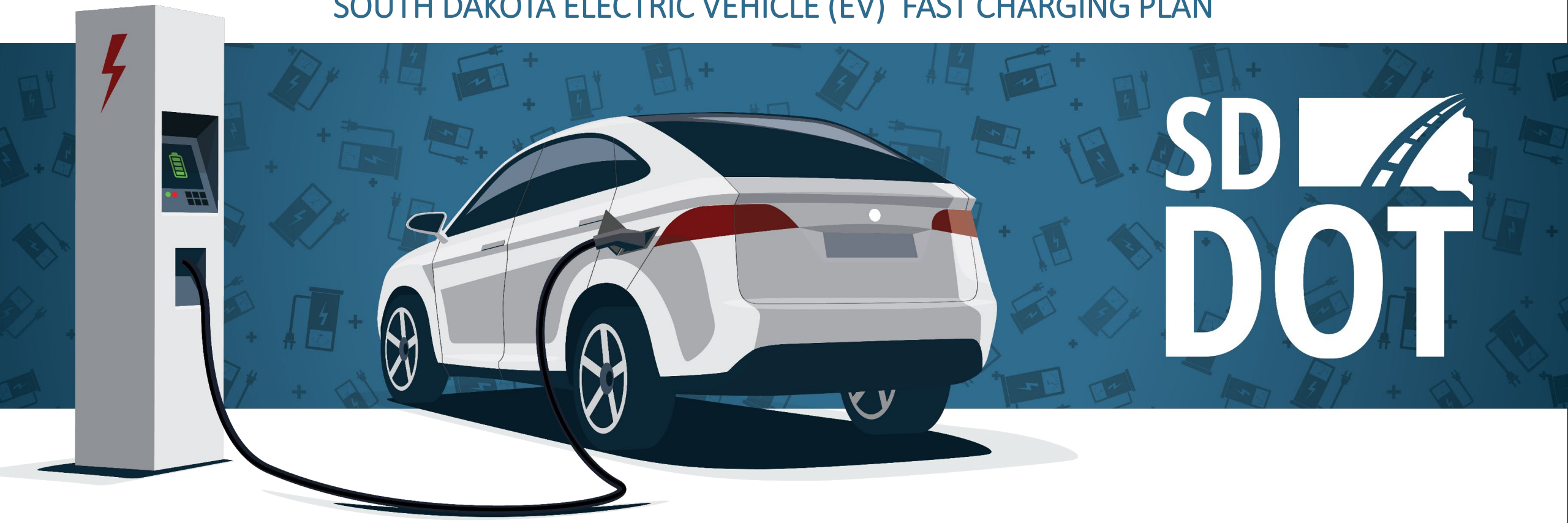
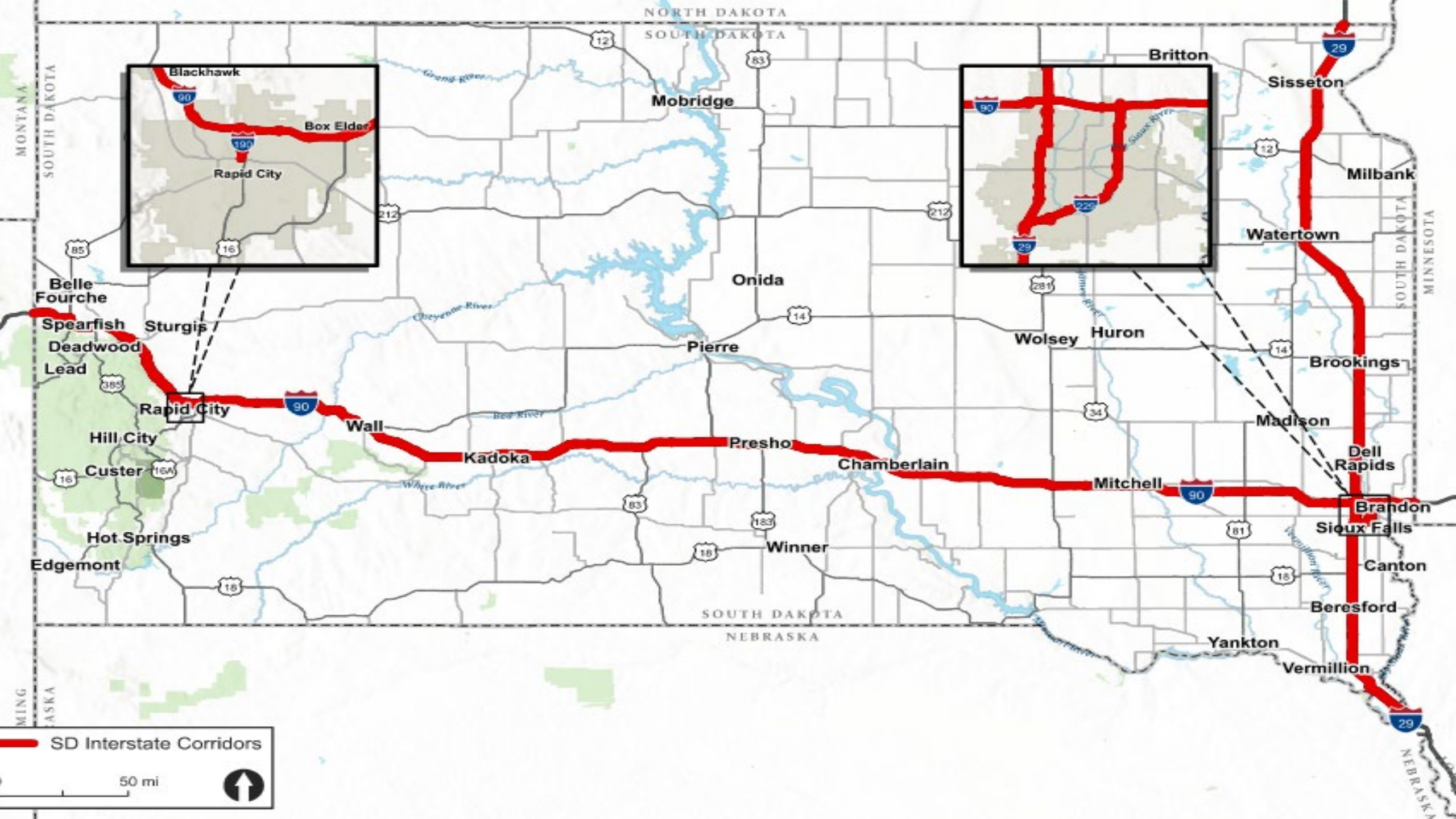
SOUTH DAKOTA ELECTRIC VEHICLE (EV) FAST CHARGING PLAN



Transportation Commission Meeting

7/28/2022


NORTH DAKOTA
SOUTH DAKOTA
MONTANA
SOUTH DAKOTA
Blackhawk
Box Elder
Rapid City
Britton
Sisseton
Milbank
Watertown
Mobridge
Onida
Pierre
Belle Fourche
Spearfish
Sturgis
Deadwood
Lead
Rapid City
Wall
Kadoka
Presho
Chamberlain
Mitchell
Wolsey
Huron
Brookings
Madison
Dell Rapids
Brandon
Sioux Falls
Canton
Beresford
Yankton
Vermillion
Hill City
Custer
Hot Springs
Edgemont
Winner
SOUTH DAKOTA
NEBRASKA
MINNESOTA
SD Interstate Corridors
50 mi

General Takeaways

1. IIJA/BIL required SD DOT to develop this plan.
2. EV Adoption in SD is very low and expected to remain very low through at least 2026
3. There are 4 Alternative Fuel Corridors in the State (the Interstates)
4. SD DOT gets ~$29 from federal gov't with a required 20% match
5. A minimum of 13 new locations are needed to achieve AFC EV Ready Status on Interstates
6. There are significant challenges to deployment of NEVI compliant EV DCFC infrastructure locations in SD

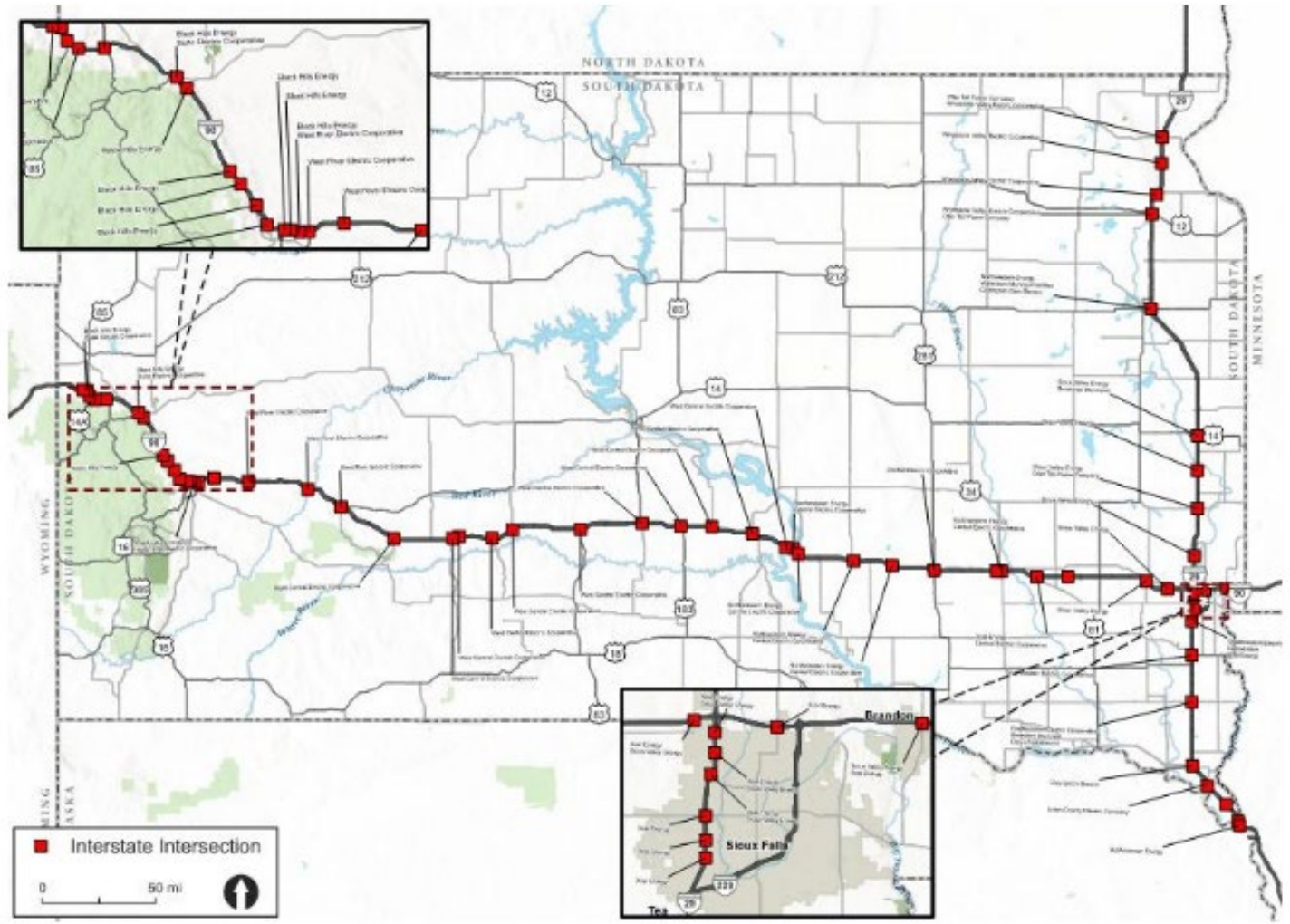
Engagement


Governmental Agency
Utility
EV Industry
Other Business/Organization
City of Sioux Falls
Wind Cave
Beresford Municipal Utilities
Black Hills Energy
Brookings Municipal Utilities
Butte Electric Cooperative, Inc.
Central Electric Cooperative, Inc.
FHWA
Forest Service
Jewell Cave
Lincoln County Commission
Clay-Union Electric
Codington-Clark Electric Cooperative, Inc.
Cozen O'Connor Public Strategies (Francis Energy)
East River Electric
Francis Energy
Minnehaha County Commission
Minnehaha County
National Park Service
Oglala Sioux Tribe
MidAmerican Energy
Montana Dakota Utilities
Otter Tail Power Company
Rural Electric Association
SD Electric Utility Companies
Pennington County
Pennington County Board of Commissioners
Rapid City
SD Association of County Commissioners
SD Office of State Engineer—Statewide Energy Manager
SD Petroleum & Propane Marketers
SD Rural Electric Association
Sioux Valley Energy
Southeastern Electric Cooperative, Inc.
SD Bureau of Information and Tele-communications
SD Department of Agriculture and Natural Resources
SD Department of Public Safety
SD Department of Revenue
Union County Electric Company
Watertown Municipal Utilities
West Central Electric Cooperative, Inc.
West River Electric Association, Inc.
Whetstone Valley Electric Cooperative, Inc.
SD Department of Tourism
SD Transportation Commission
Sioux Falls Urbanized Development Commission
Center for Disabilities
Greater Sioux Falls Chamber of Commerce
Greenways2go
Lincoln County Economic Development Association
Parker Transfer and Storage
Xcel Energy
Electrify America
Francis Energy
ChargePoint
Rapid City Metropolitan Planning Organization
Rushmore Region Economic Development Alliance
SD Automobile Dealers Association/ SD Trucking Association
Sioux Metro Growth Alliance
Siouxland Interstate MPO
Northwestern Energy
Power Up EV Charging and Solar
SD Municipal League
SD Retailers Association
Sioux Falls MPO
Walmart


Governmental Agency
Utility
Other Business/Organization
SD DOT—Environmental
SD Transportation Commission
SD Department of Public Safety
SD DOT—Transit
SD Municipal League
SD Office of State Engineer—Statewide Energy Manager
SD Department of Tourism
SD Association of County Commissioners
SD Department of Revenue
FHWA—Planning
SD Bureau of Information and Telecommunications
SD Department of Agriculture and Natural Resources
SD Transportation Commission
SD Retailers Association
Center for Disabilities
Sioux Falls Metropolitan Planning Organization
Oglala Sioux Tribe
SD Automobile Dealers Association/ SD Trucking Association
Rapid City Metropolitan Planning Organization
Siouxland Interstate Metropolitan Planning Council
Sioux Valley Energy
Rural Electric Association
SD Electric Utility Companies

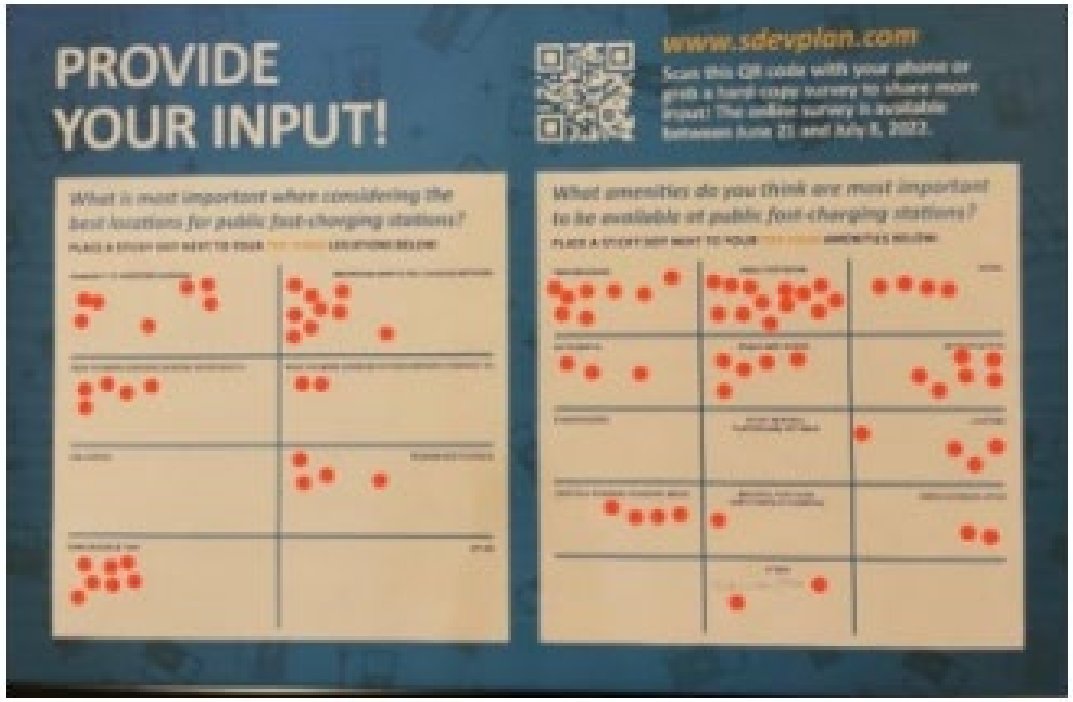
Utility Input

Utilities in South Dakota Indicated that the Electrical Grid Could Meet the Required Electrical Load Under Normal Operating Conditions



Public

- Two in-person Public Meetings
- On-Line Virtual Public Meeting

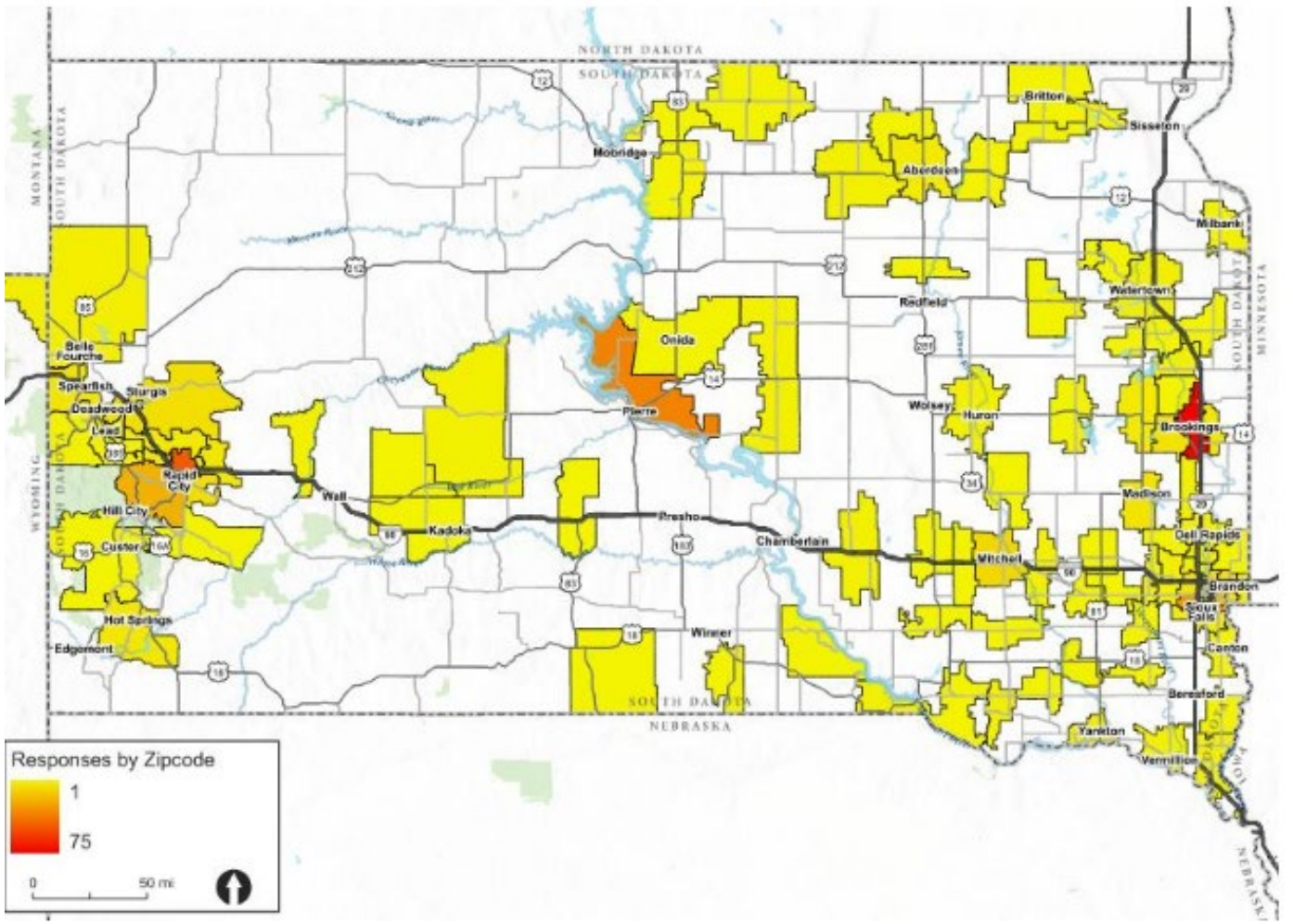


Public

- 546 surveys completed
  - 26-49 → 50%
  - 50-64 → 21%
  - 66% Male
  - 88% White
  - 21% EV Owners

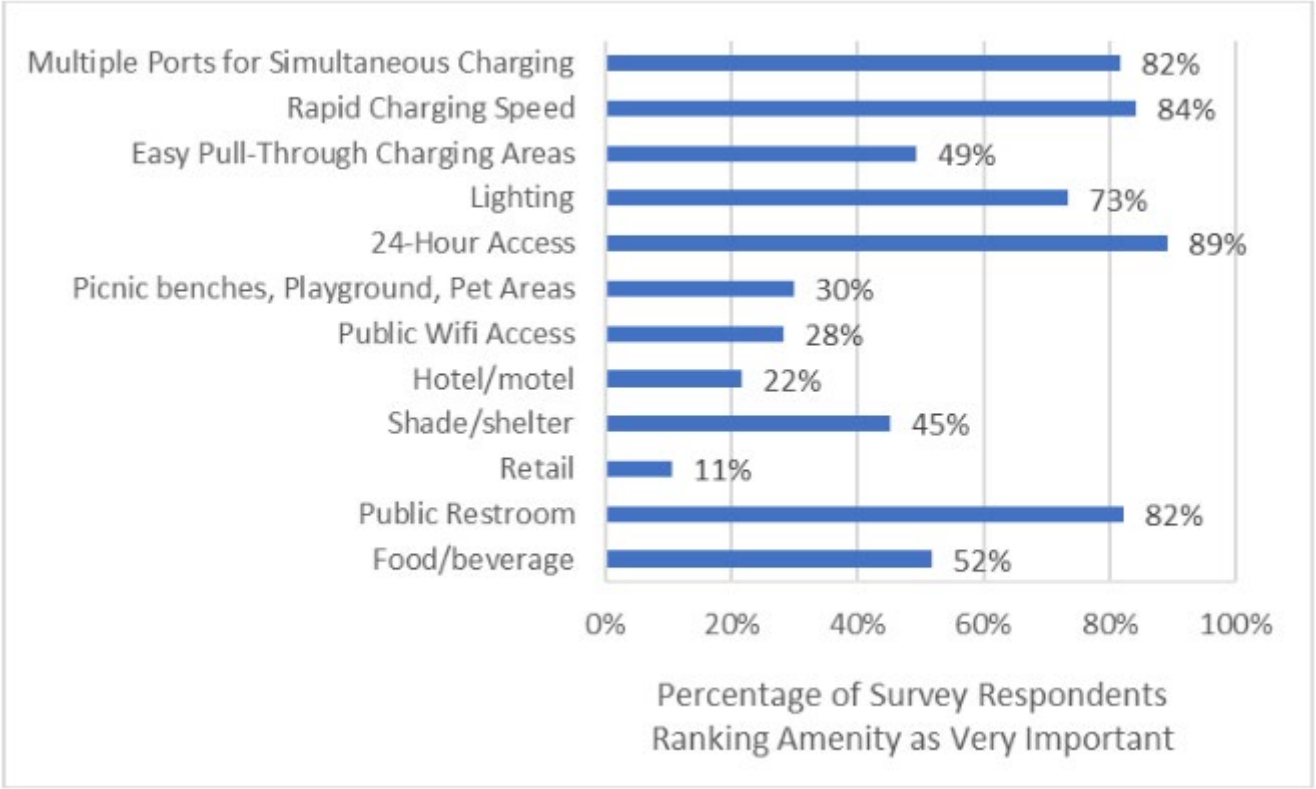
Top Three Priorities

1. Proximity to Interstate/highway (47% ranked as #1 priority)
2. Addressing gaps in the charging network (25% ranked as #1 priority)
3. Need for more charging in rural South Dakota (11% ranked as #1 priority)



Public

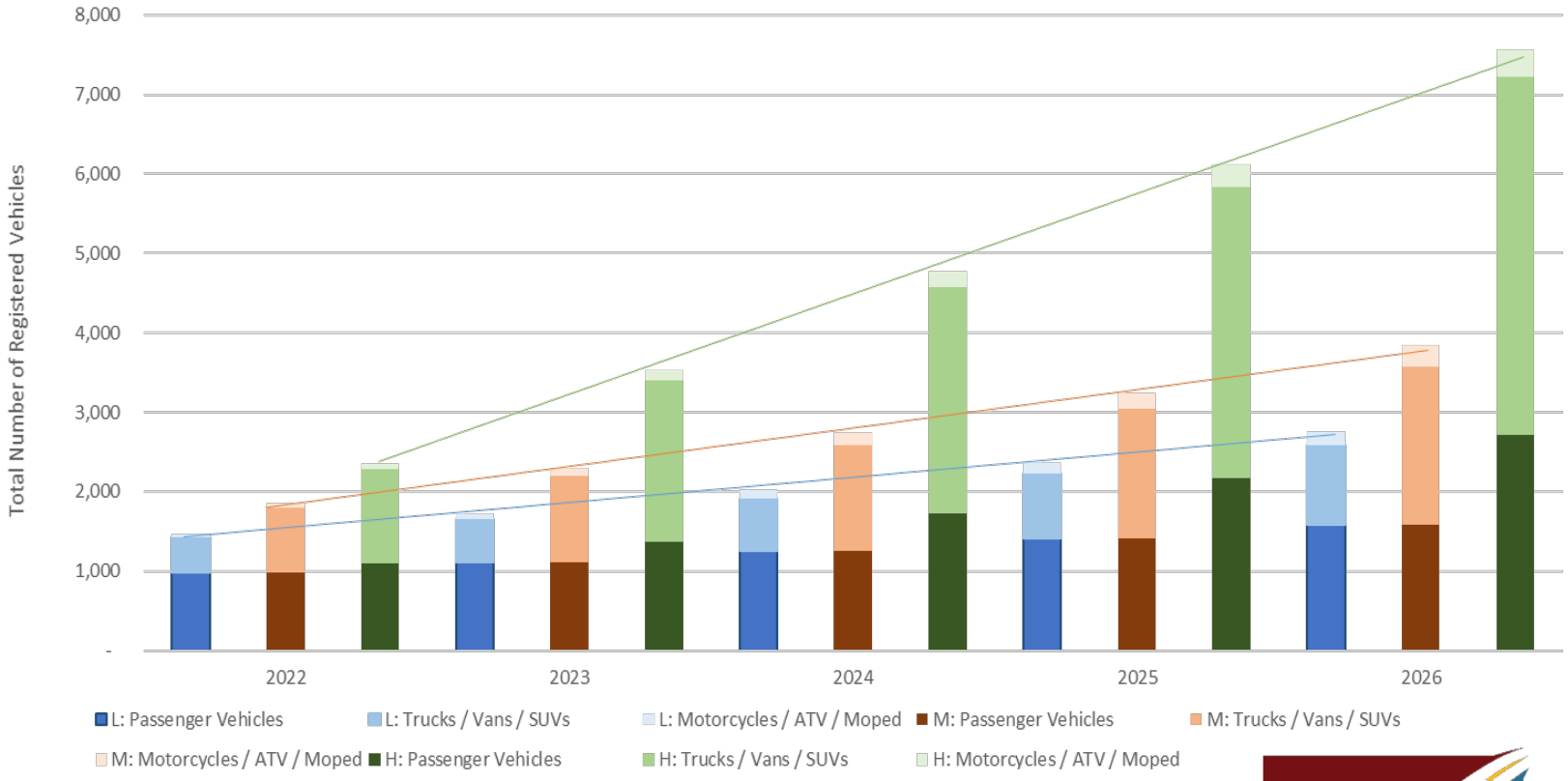
- Key Topics of Concern
  - Financial considerations
  - Potential locations
  - Electrical grid/environmental impacts
  - Site configuration
  - Other topics



Existing and Future Conditions

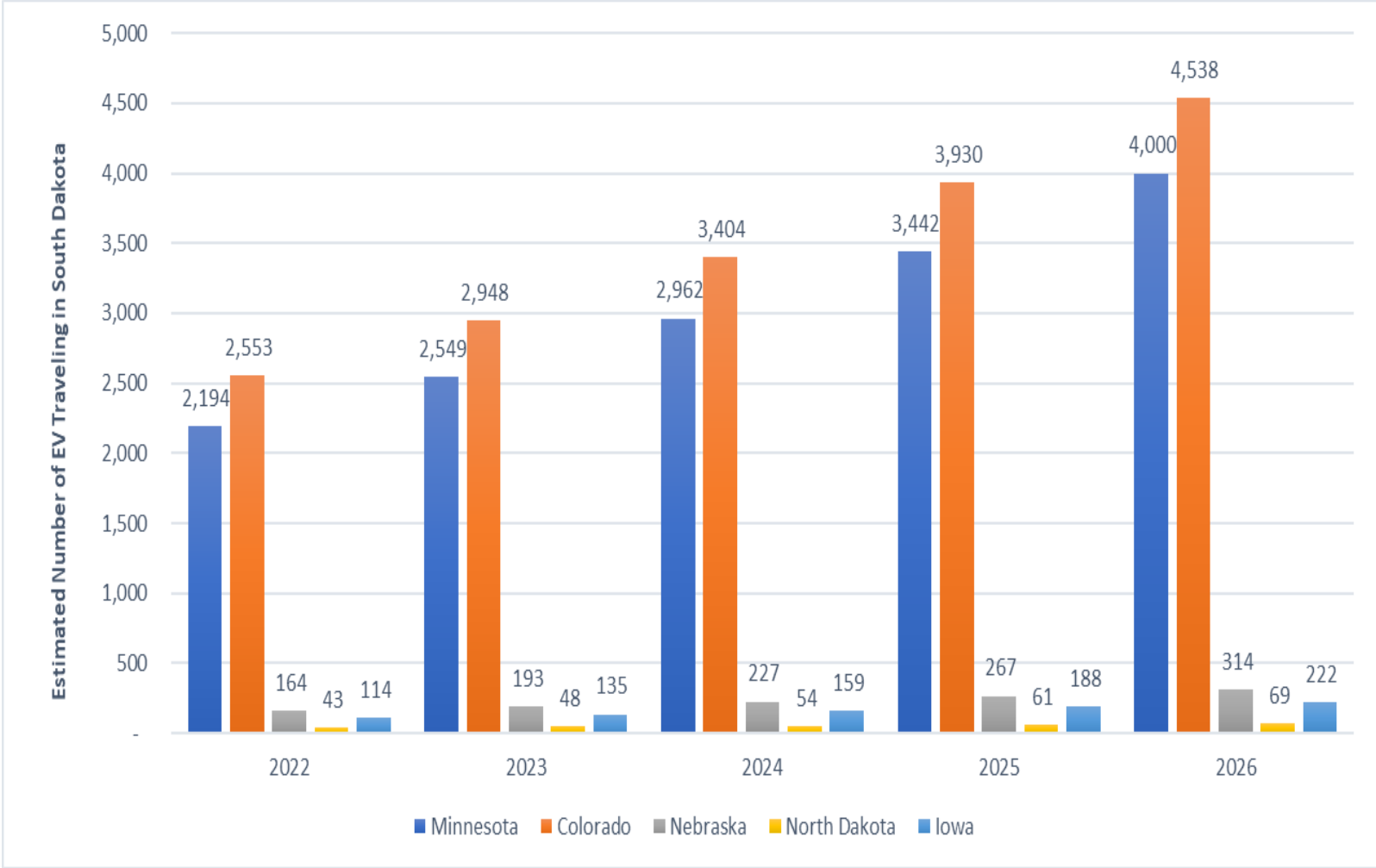
Electric Vehicle Adoption in South Dakota is Low and Expected to Remain Relatively Low for the Next Several Years

South Dakota has the third lowest number of EVs among all states in the U.S. having only has 1,429 registered EVs in the state representing 0.12% of all registered passenger vehicles, SUVs, vans, and light-duty trucks. Even under an aggressive growth projection, registered EVs in South Dakota are not expected to be more than 0.56% of all state passenger vehicle, SUV, vans, and light-duty trucks registered in 2026.



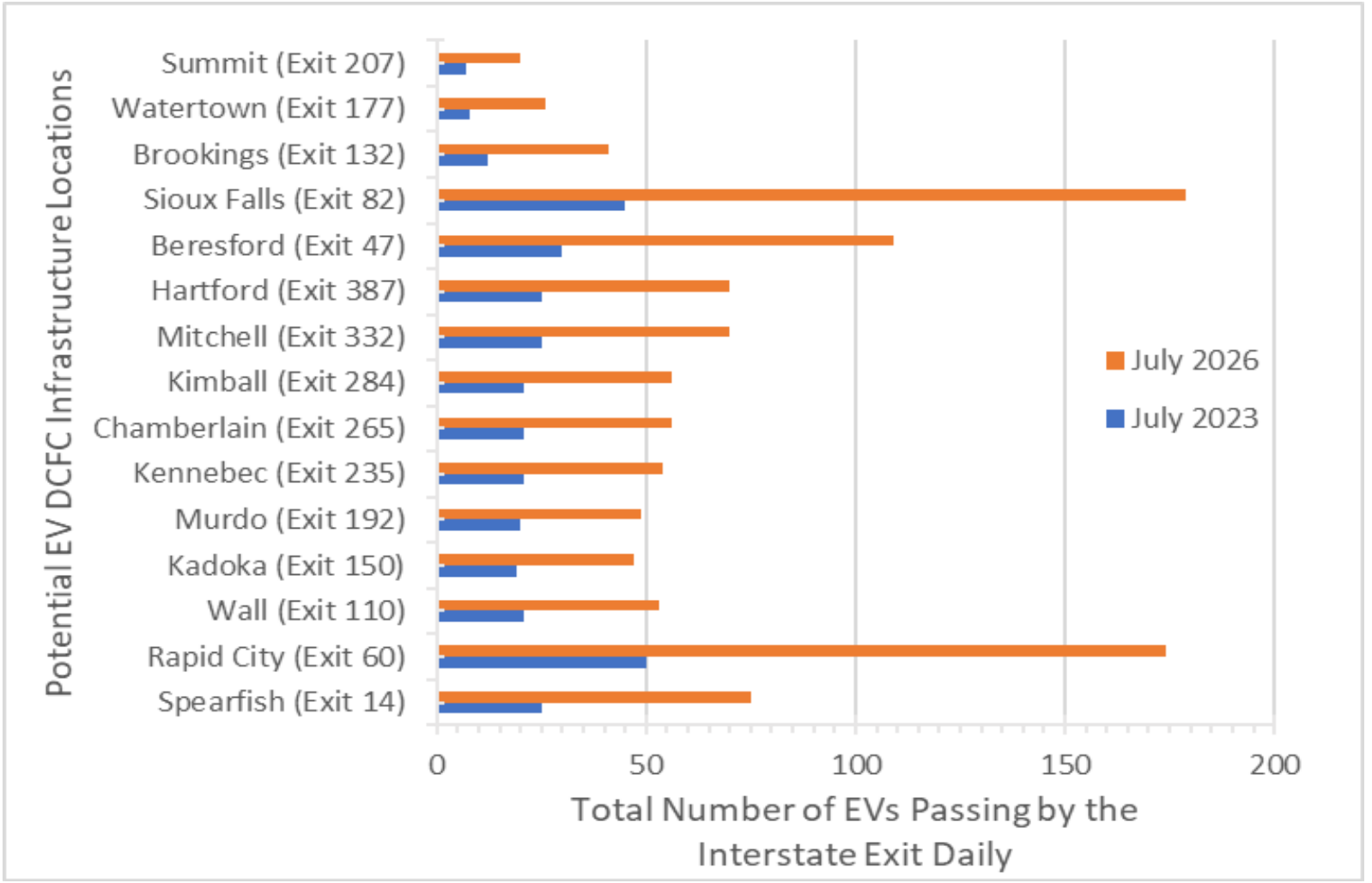
Existing and Future Conditions

- Tourism Traffic will net another ~9,000 annual EVs using Interstates in South Dakota by 2026



Existing and Future Conditions

- Daily volumes of EVs passing by various Interstate exits will not exceed 200 vehicles per day even in the some of the busiest tourist months



Existing and Future Conditions

Terrain and Climate Considerations

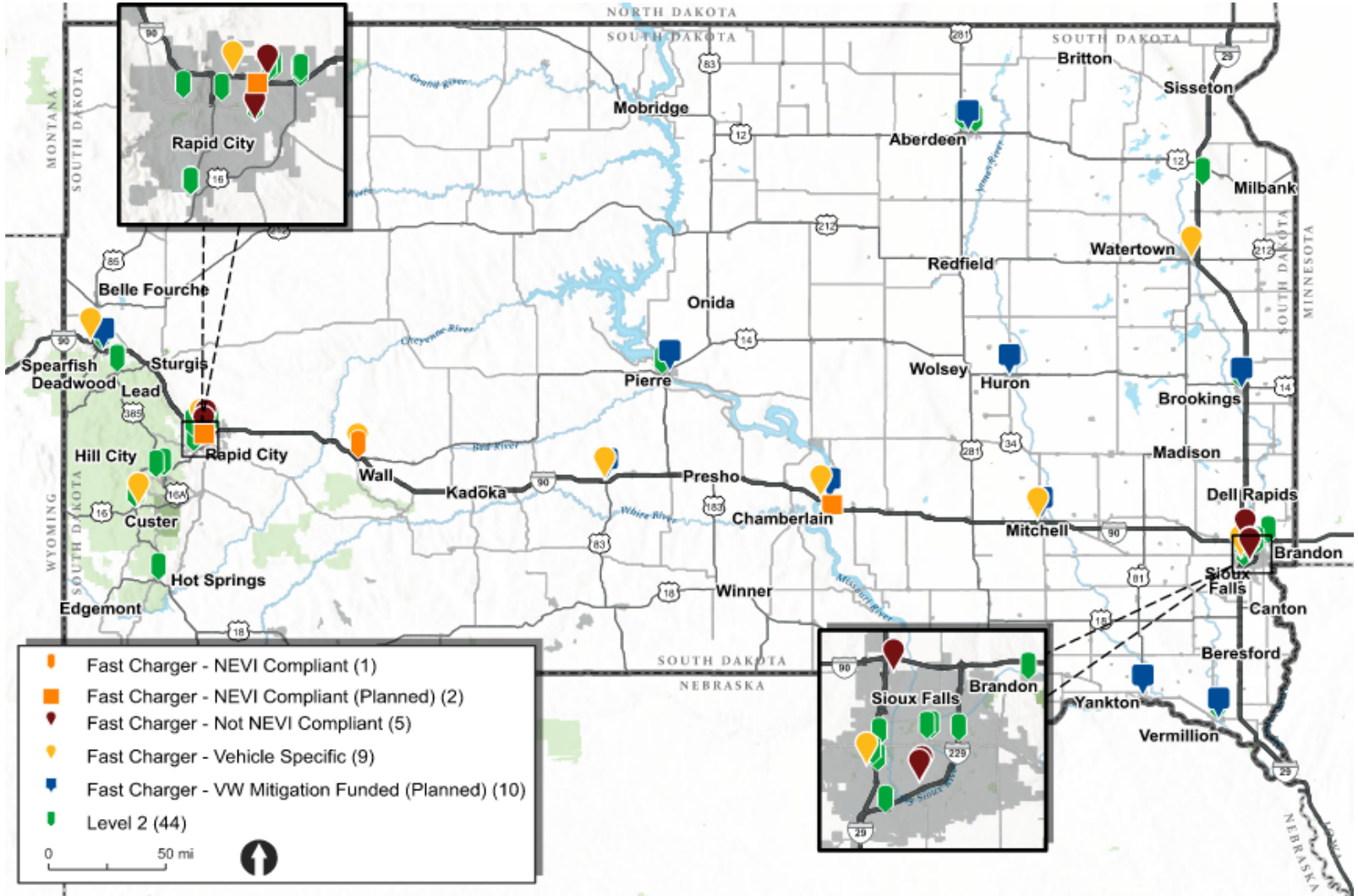
South Dakota topography and temperature fluctuations can be expected to have a significant impact on EV charging times and range. EV DCFC infrastructure spaced 50-miles apart should be more than sufficient to meet the expected demand.

Travel Patterns Considerations

I-90 is the most heavily traveled Interstate for both non-commercial and freight traffic. Traffic volumes on all Interstates are relatively low outside of urban centers. Most in-state trips are under 60 miles. Tourism is a significant contributor to Interstate traffic, with peak traffic volumes in the summer months. Public intercity bus service connects cities along I-90 and I-29.

Existing and Future Conditions

There Is Only One Existing EV DCFC Infrastructure Location in South Dakota That Would Be NEVI Program-Compliant (Wall, SD)

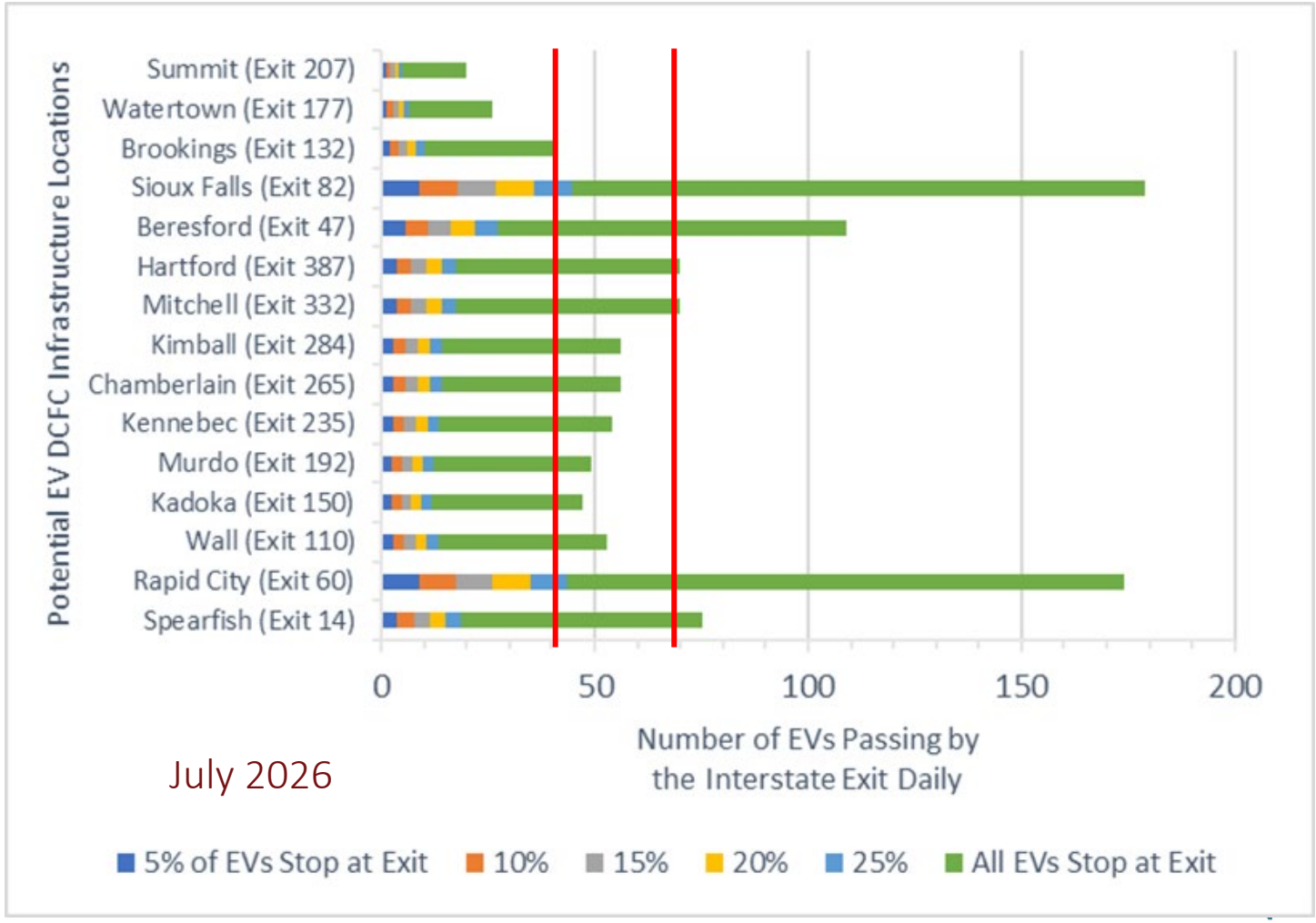


Existing and Future Conditions

Challenge #1: Attracting Private Interest Due to Return on Investment

- SD DOT prepared estimates using conditions and factors suitable for South Dakota that resulted in similar findings when the EV owner is charged $0.20/minute resulting in 76 charges per day

- Raising the charge per minute to $0.40/minute reduces the minimum number of charges per day to 40 charges per day



Existing and Future Conditions

Challenge #2: Impact of Peak Demand Charges on Profitability

- Monthly peak demand charges based upon the highest peak load during a 15-minute period within the month
- South Dakota is only expected to occupy 22% of the total capacity of the EV DCFC infrastructure at a given location

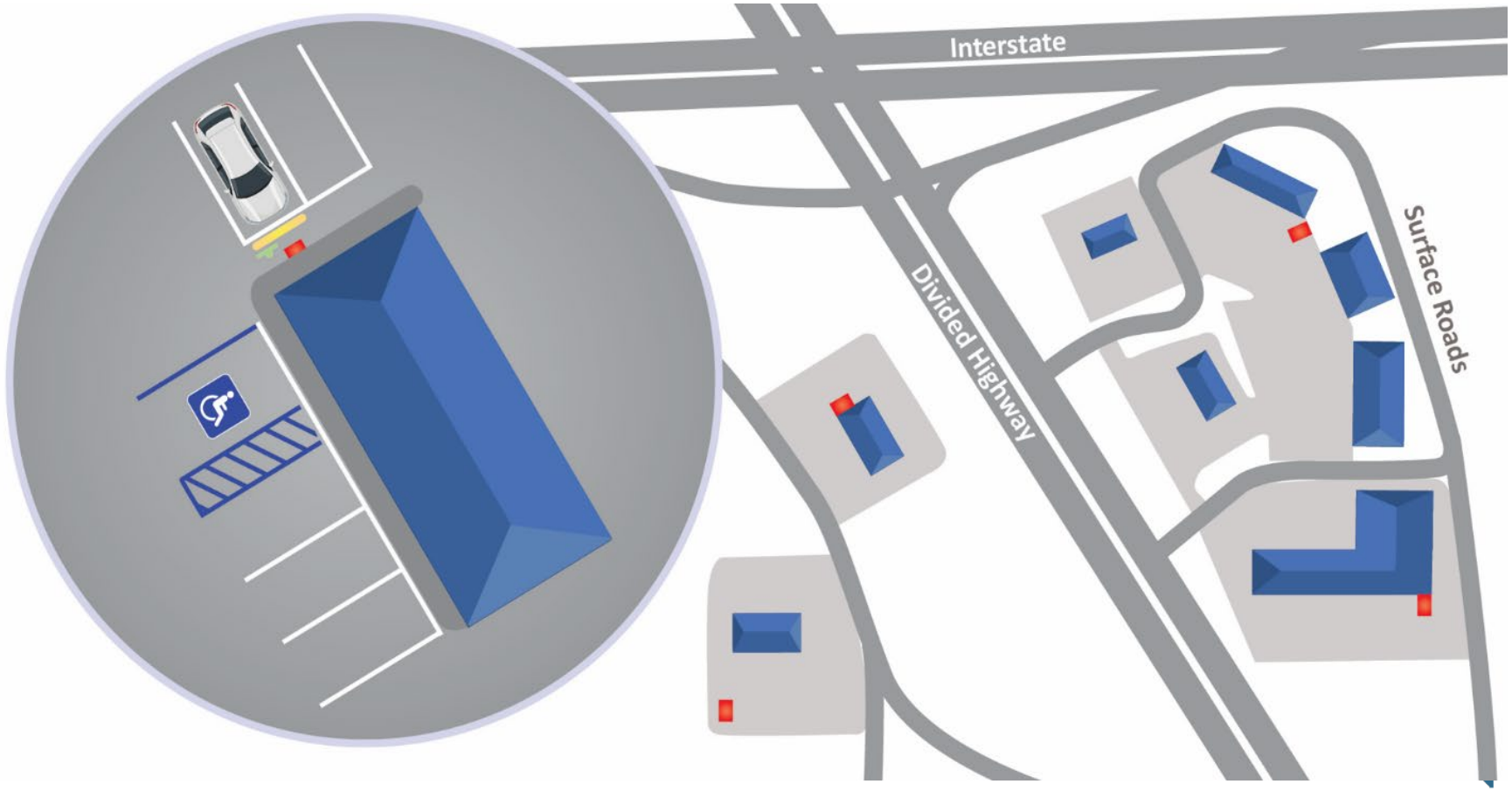
Scenario	Revenue per Charging Session	Per Charging Session Electrical Cost	Assessed Monthly Demand Charges	Effective Electricity Costs per Charging Session	Total Monthly Revenue/ Electricity Costs
Assumptions: 4 Charging Sessions per Location for 30 Days Each Charging Session is 17 minutes long requiring 42.5kW hours	$3 per session access charge $0.20 /per minute charging fee	$0.07 per kW hour	$6.60 per kW		
Only one vehicle charging at a time (150kW Demand Assessed)	$6.40	$2.98	$990/ month	$11.23 ($2.98 +$8.25)	$768 Revenue[a]/ $1,348 Costs[b]
Two vehicles simultaneously charged at least once (300kW Demand Assessed)	$6.40	$2.98	$1,980/ month	$19.68 ($2.98 +$16.50)	$768 Revenue/ $2,362 Costs
Three vehicles simultaneously charged at least once (450kW Demand Assessed)	$6.40	$2.98	$2,970/ month	$27.65 ($2.98 + $24.75)	$768 Revenue/ $3,318 Costs
Four vehicles simultaneously charged at least once (600kW Demand Assessed)	$6.40	$2.98	$3,960/ month	$35.98 ($2.98 + $33.0)	$768 Revenue/ $4,318 Costs

a. Monthly revenue of $768 = 4 charging session per day * 30 days* $6.40 per session
b. Monthly costs = Cost of charging session * 76 charging sessions per day* 30 days

Existing and Future Conditions

Challenge #3: Creating Opportunities for Small or Disadvantaged Business

- Capital Costs $140k-$240k per NEVI compliant location based upon $700k-$1M in total capital costs
- Solution: allow for physically separate sites at a given geographic location



Existing and Future Conditions

Challenge #4: Geographic Diversification Post-Interstate Build-Out

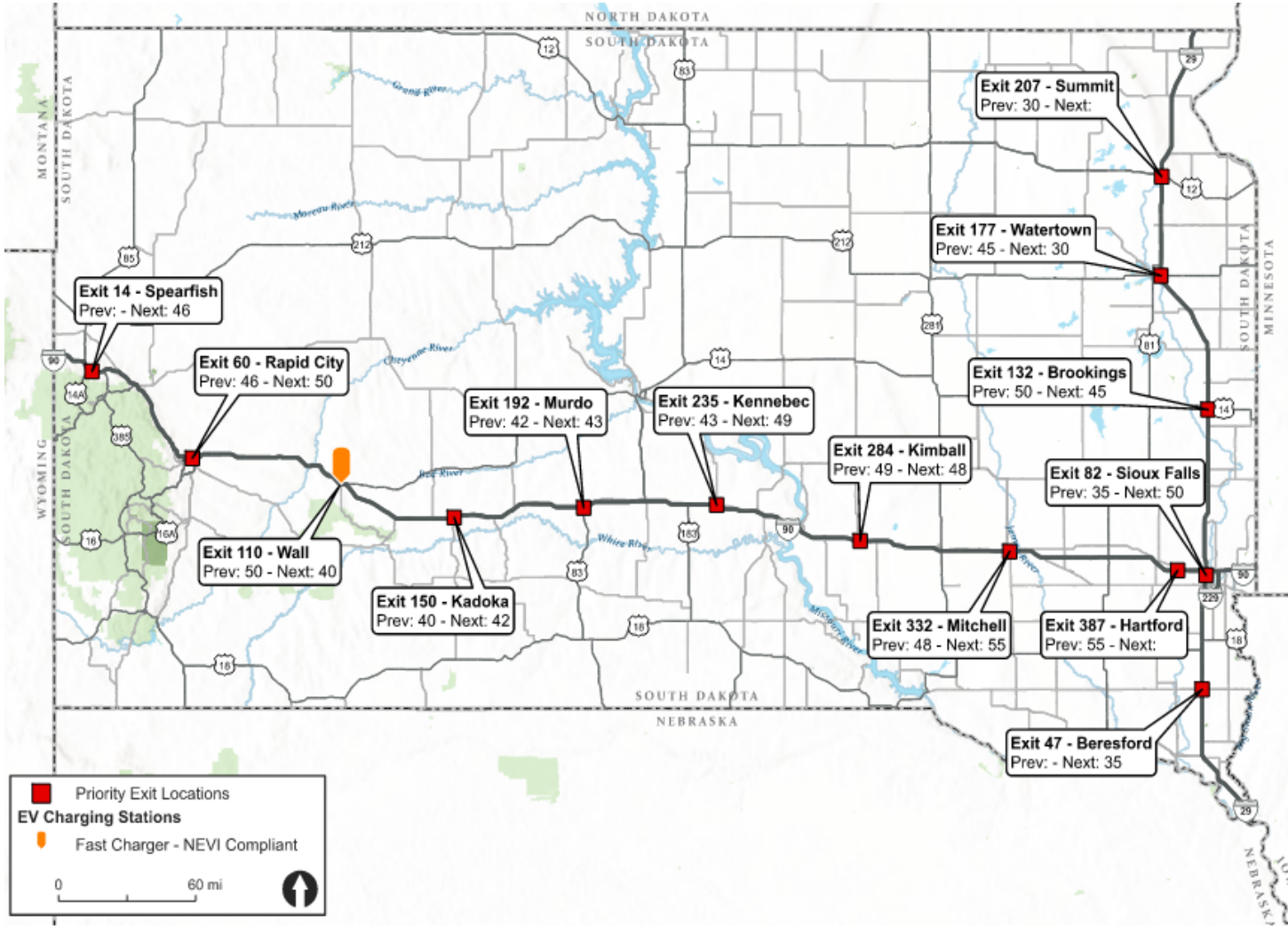
- Other highways will have even lower usage than Interstates
- Reduce the number and output of the DCFC infrastructure as a trade off for geographic coverage

Strategies for Post AFC Build-Out

- Reduce Distance Between Consecutive Charging Stations Along Interstate Corridors.
- Concentrate Charging Locations at Tourist Destinations.
- Establish DCFC Charging Capabilities in Population Centers.
- Saturate Heavily Traveled Interstate Segments
- Maximize Geographic Coverage Through Using Reduced Requirements for Non-Interstate Locations.

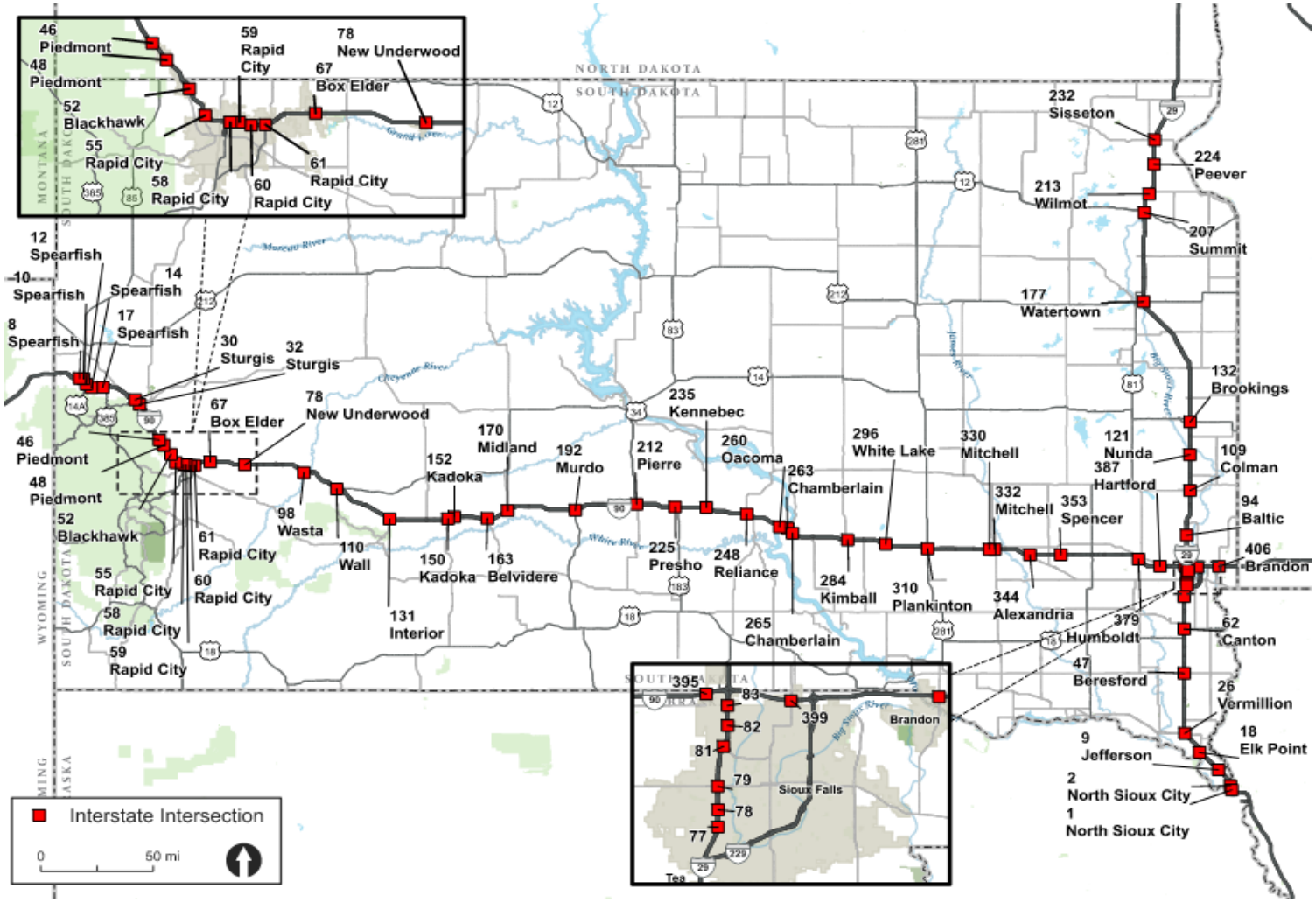
EV Charging Infrastructure Deployment

- Minimum of 13 additional and 1 existing DCFC infrastructure needed for complete build-out
- Other locations will also be considered
- Deployment no sooner than FY24



EV Charging Infrastructure Deployment

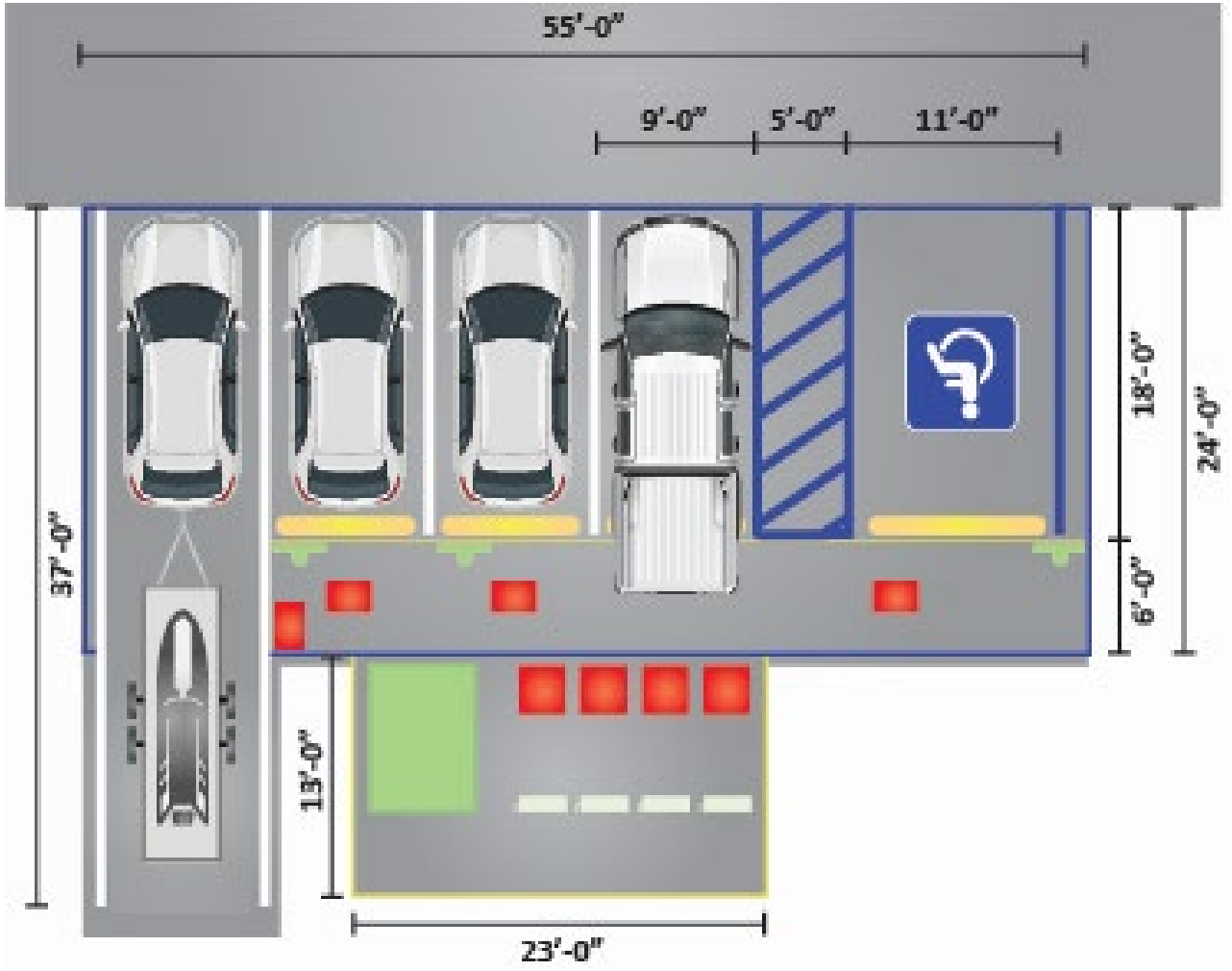
- Vetted 45 alternative locations to minimum set
- Generally power available under normal operating conditions



EV Charging Infrastructure Deployment

Deployment Details

- Deployments no sooner than FY24
- No SD DOT funds being proposed for matching requirements (20%)
- Freight not incorporated except as potential EV DCFC infrastructure locations
- Transit implicitly accommodated through requirement of accommodations for vehicles with trailers



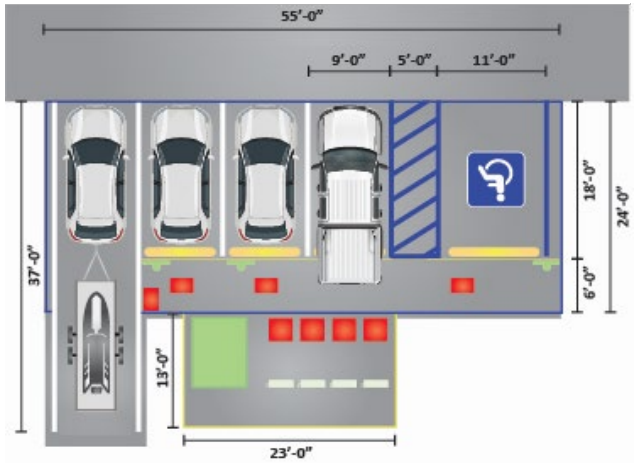
Implementation

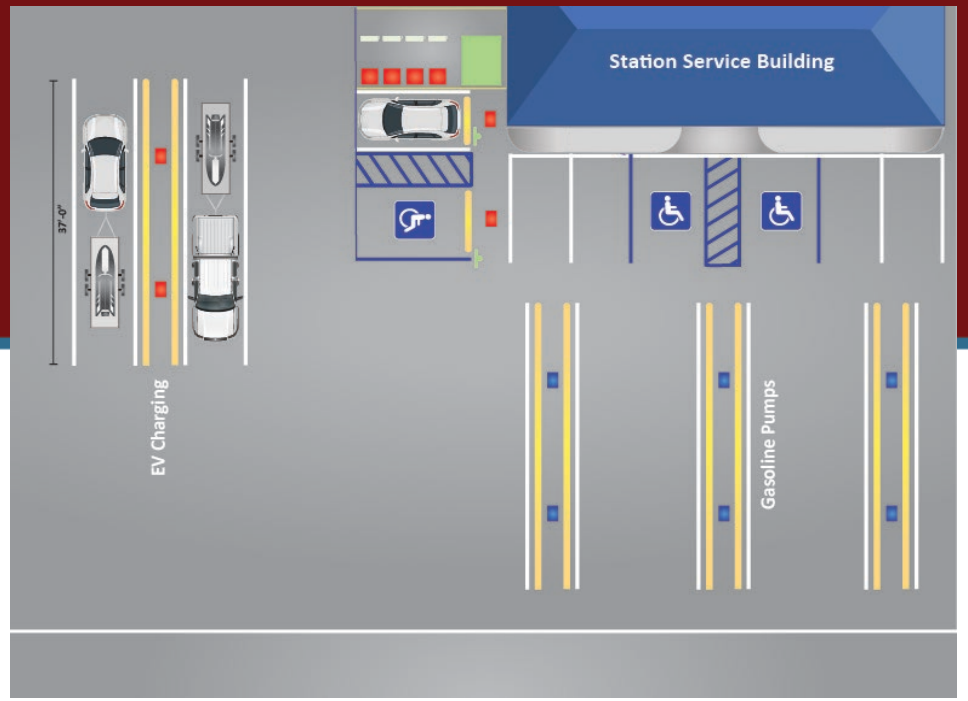
SD DOT Will Use a Two-step Process for Determining Locations and Awarding Grants for EV DCFC Infrastructure Locations

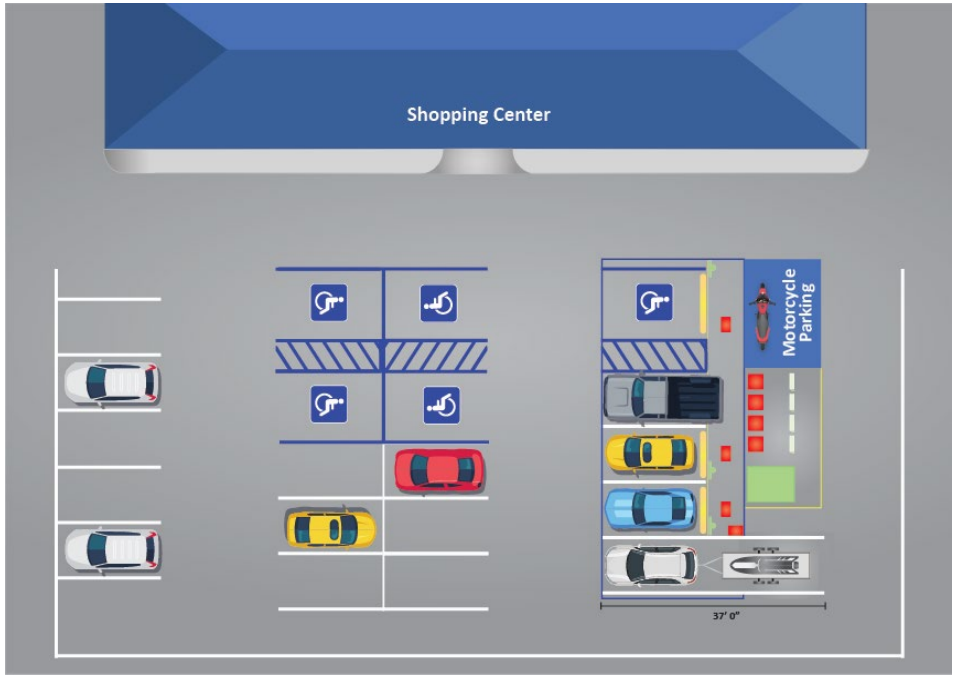
1. SD DOT will screen potential applications to determine if they are at locations needed to achieve the NEVI Program 50-mile spacing requirement, as well as the other NEVI Program and federal requirements.
2. If multiple applications are received for a given location, SD DOT will use a methodology to develop a site suitability score to prioritize applications for award.

Criterion	Rationale for this Criterion	Weight
Total Amount of Public Funding being Requested	Gives higher priority to applications that are more cost effective in requesting a lower amount of public funding.	25%
Percentage of Matching Funding Being Requested	Gives higher priority to applications where the private company is providing a higher percentage of the total costs. Maximizes public investment funds.	25%
Total Number of Locations Applicant is Applying For	Gives higher priority to applicants who are applying for multiple locations. Reduces administrative burden and costs.	10%
Availability of Amenities	Sites with more accessible amenities such as restrooms are prioritized over sites with restrictions on availability.	25%
Disadvantaged Business Enterprise	Applicants that represent a small or disadvantaged business will receive a priority.	7.5%
Located within a Justice40 or Disadvantaged Community (DAC) Zone	Gives priority to sites located within a Justice 40 Zone.	7.5%

Implementation







Labor and Workforce

- EVITP site shows 15 certified providers in South Dakota.
- SD DOT will continue to engage trades groups within the state to increase these numbers to support the industry
- SD DOT sets an overall DBE goal for federal-aid contracts annually. The EV DCFC infrastructure deployment will fall under this program, and DBE participation will be monitored.

Program Evaluation

State Goals	Indicator	Measures
Provide continuous linkage to national EV fast charging network in surrounding states. Achieve a "complete build-out" on all Interstate segments within South Dakota.	Network completion	› Number of NEVI Program-compliant stations on I-29 and I-90. › Achieving "EV Corridor Ready" status for designated AFCs.
Support South Dakota's economic vitality by enabling tourists with EVs to reach and visit South Dakota's attractions.	Access and satisfaction	› Number of publicly accessible chargers serving key tourist routes. › Number of unique users per charging station. › Survey by South Dakota Department of Tourism includes satisfaction measure associated with charging infrastructure in the state.
Gather data and monitor the utilization of EV fast chargers within South Dakota.	Reporting process	› Reporting requirements included in contracting/procurement with vendors. › On time reporting by vendors.
"Right size" the EV infrastructure to accommodate the current and future EV charging needs balancing geographic coverage with the number and size of charging ports at each location.	Utilization and reliability	› Charger utilization. › Reliability of chargers.

Final Thoughts

- SD DOT recognizes that there are very real challenges:
  - Private sector interest
  - “Profitability” of NEVI compliant locations in South Dakota
  - Potential impediments to participation by small and/or disadvantaged businesses
  - “Right-sizing” EV DCFC infrastructure for non-Interstate locations
- SD DOT exercising a thoughtful approach to deployment allowing time for supply chains, equipment costs, electrical costs, and deployment lessons to be learned. Deployments would begin no sooner than FY24 in South Dakota.
- No discretionary exceptions requested at this time.

Thank You!

SD DEPARTMENT OF TRANSPORTATION