Siting Charging Infrastructure: Tools and Considerations

A planning framework for states, local governments, utilities, developers…

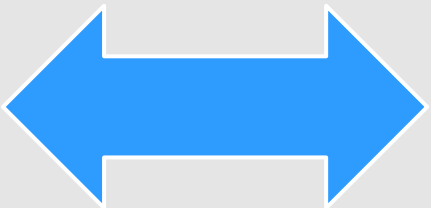
Electric Vehicle Grid Integration: Interactive Virtual Summit

September 17, 2020

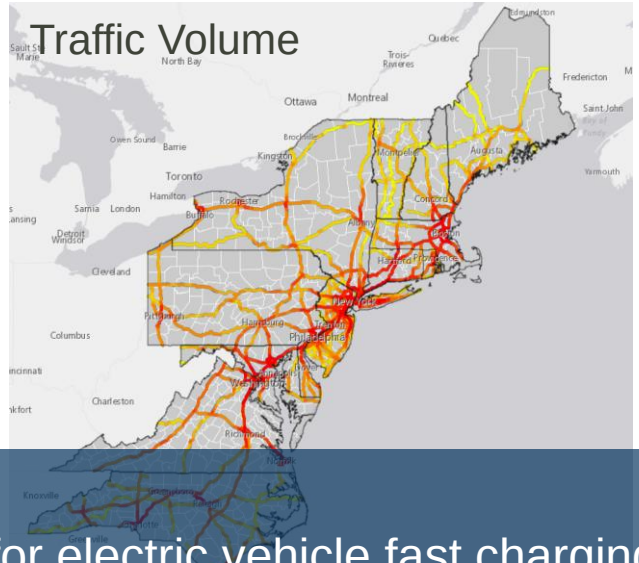
Grace Van Horn

MJB & A

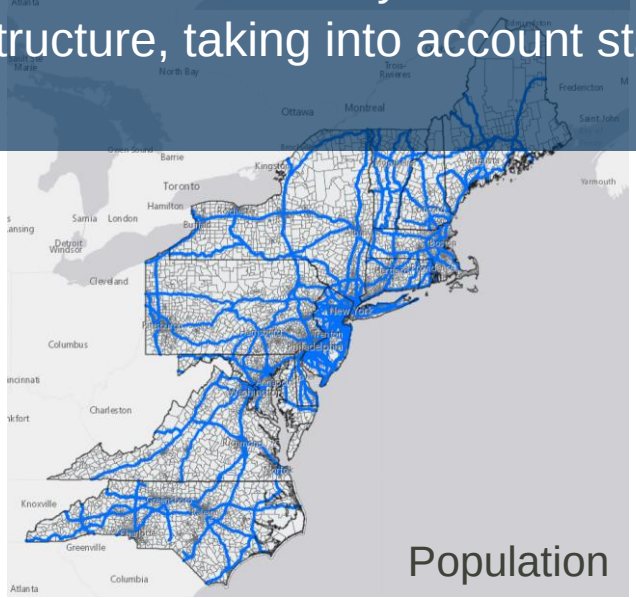
Siting Charging Infrastructure – A Balancing Act

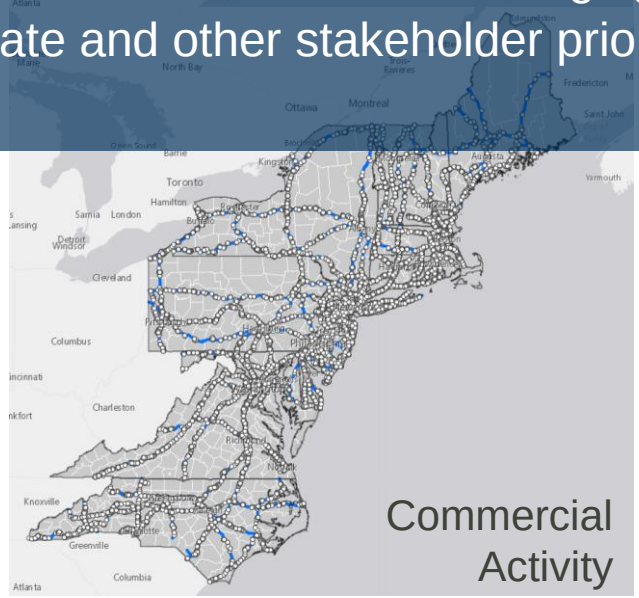
Limited Funding		Aggressive Policy Targets
Developing Market		Urgent Need
Immediate Utilization		Equitable Expansion
Long Distance Travel		Local Utilization

Balancing These Factors: Local Priorities



What locations may be suited for electric vehicle fast charging infrastructure, taking into account state and other stakeholder priorities?





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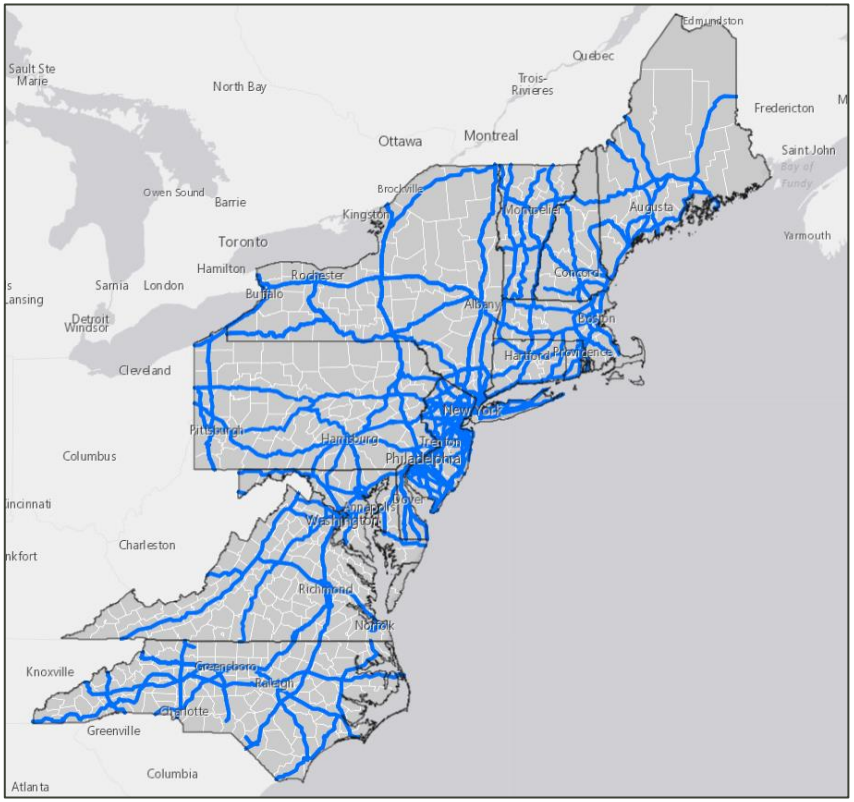
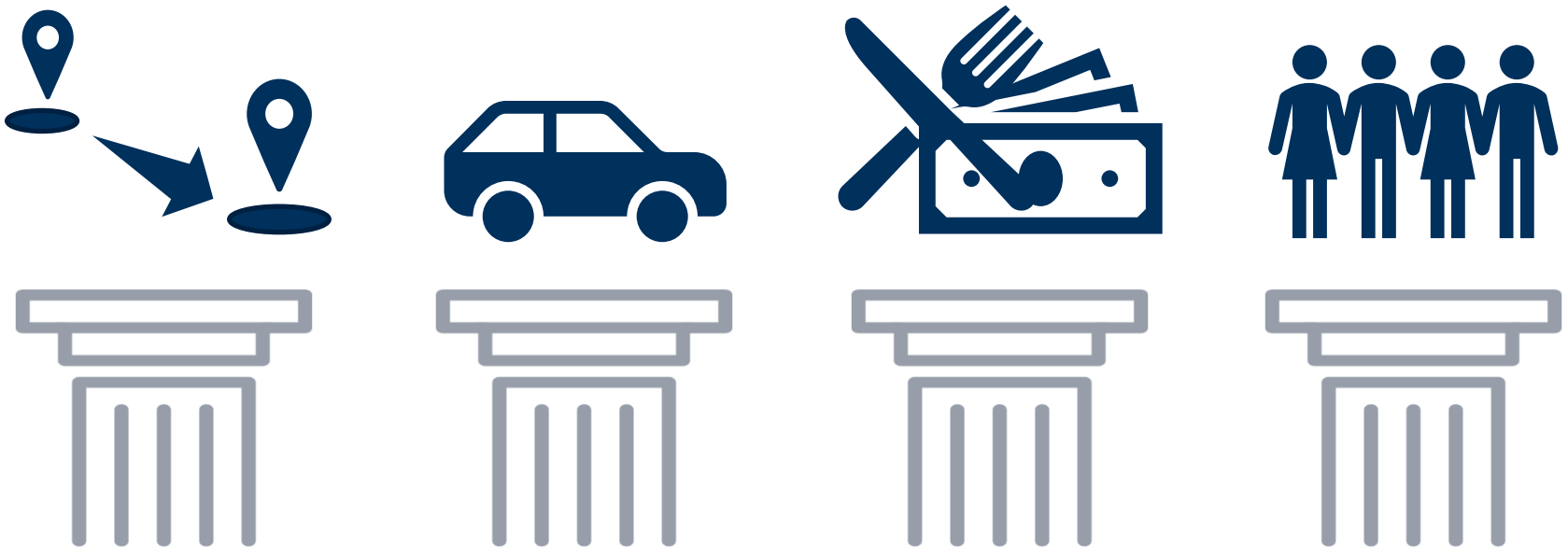
MJB&A EV Infrastructure Location Identification Tools: Customizable Priorities

MJB&A utilized a GIS platform to collect and organize data on over 13,500 miles of key corridors in 13 states—the Transportation & Climate Initiative region (including D.C.) and North Carolina

- Assessed DC fast charging opportunities along all designated federal corridors plus additional state priority corridors
- Focused on interstate exits and other key intersections
- Worked with state participants to refine dataset, parameters, and metrics
- Developed metrics for each possible location that can be weighted and combined into one final score
- Produced an Excel model and two online Visualization Maps for stakeholders to run scenarios and compare results



Siting Priorities Considered



Proximity to Existing Charging	Traffic Volume	Commercial Activity	Population Density
Including all or a subset based on plug type: • Distance to nearest DCFC station • Density of existing stations	**Roadway segment:** • Average annual daily traffic (AADT) • Peak traffic factor (k-factor) • Peak traffic volume (AADT*k-factor)	Number of stores, restaurants, gas stations, etc. within 1 mile of each exit	Population density of surrounding census tract

Visualizing and Comparing Results: Scenario Analysis

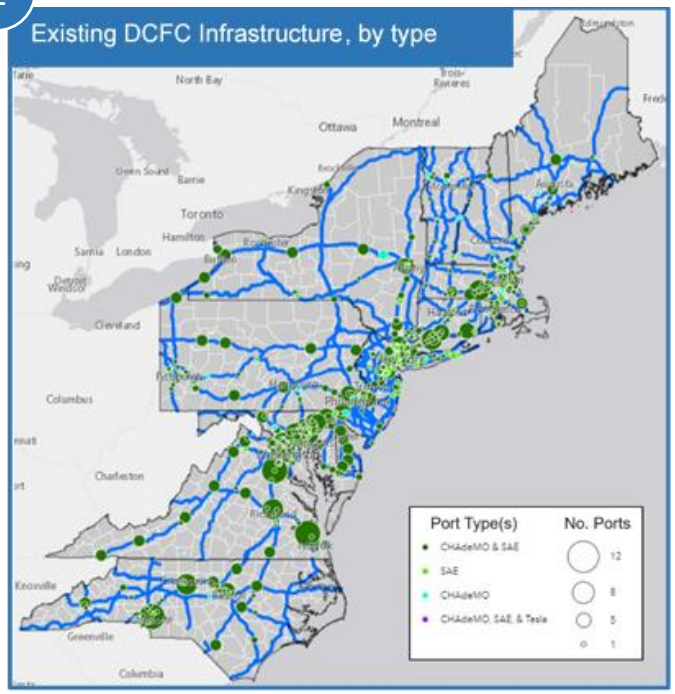
1 Ranking Tool

Sample rankings of North Carolina ranked nodes, using the Through Traffic ranking methodology

Rankings: All Exits (with service plazas) in North Carolina: 'Through Traffic' Weighting Method

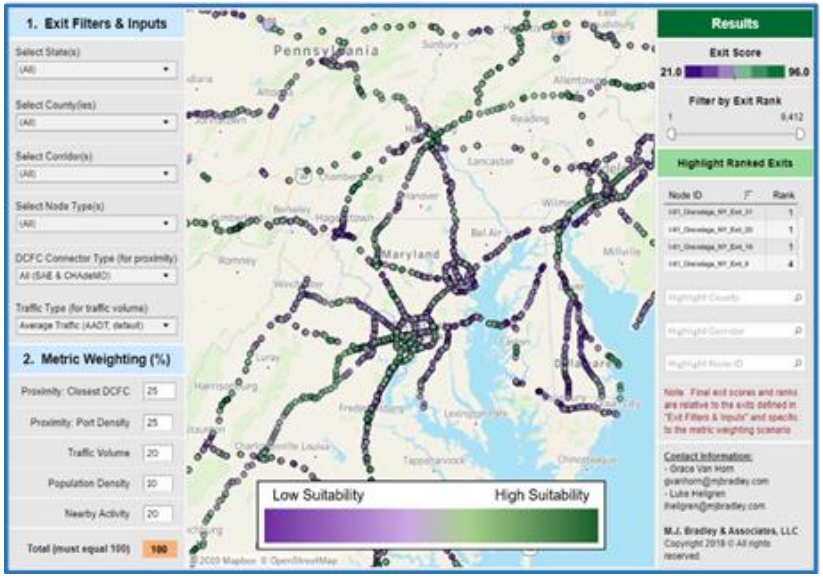
Weights →		15%	15%	30%	10%	30%	
		Proximity		Demand		Convenience	Final
Final Rank	Exit ID	Closest DCFC	Port Density	Traffic	Population	Nearby Activity	Score
1	US-17_Craven_NC_Exit_4	10	10	8	9	10	**93.0**
2	US-17_Craven_NC_Exit_5	10	10	9	9	9	**93.0**
T-3	I-40_Forsyth_NC_Exit_3	7	10	9	9	10	**91.5**
T-3	US-17_Brunswick_NC_Exit_25	9	10	9	9	9	**91.5**
T-5	I-95_Harnett_NC_Exit_4	7	10	9	7	10	**89.5**
T-5	US-421_Forsyth_NC_Exit_5	7	10	9	10	9	**89.5**
T-5	I-40_Forsyth_NC_Exit_4	6	8	10	8	10	**89.5**
T-5	I-40_Forsyth_NC_Exit_5	5	8	10	10	10	**89.5**
T-9	US-421_Forsyth_NC_Exit_6	6	8	9	10	10	**88.5**
T-9	I-40_Iredell_NC_Exit_5	6	8	9	10	10	**88.5**
T-11	US-70_Carteret_NC_Exit_7	10	10	7	7	10	**88.0**

2 Data Viewer



3 Results Viewer

Sample rankings of selected ranked nodes using the Results Viewer, emphasizing "gaps" in the existing network



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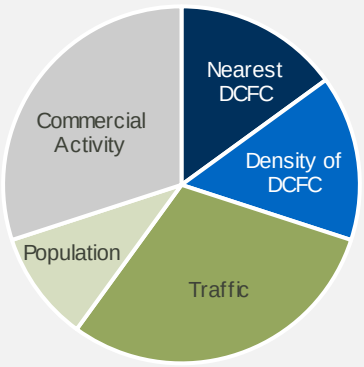
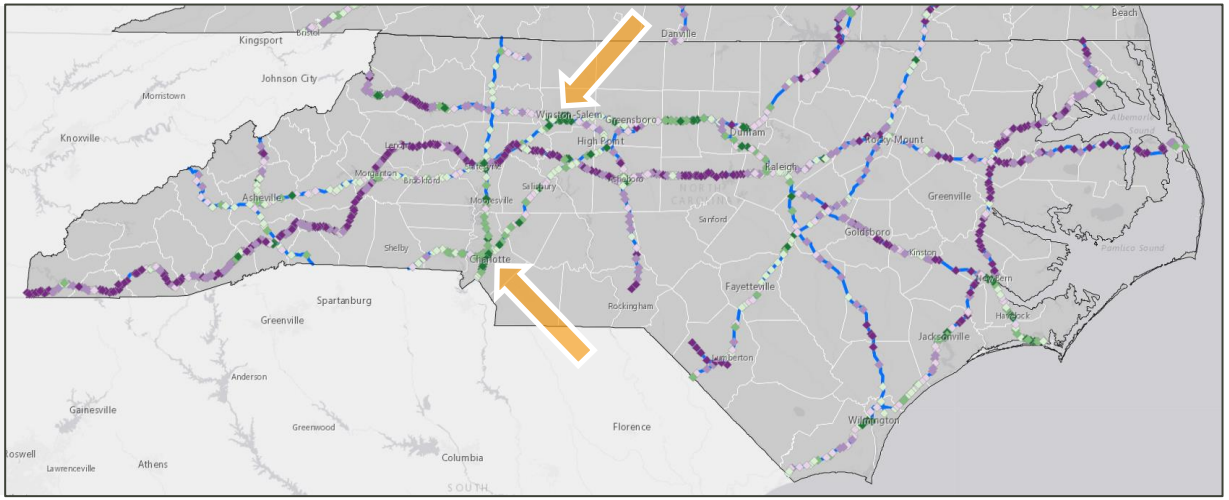
Balance of Priorities Drives Outcomes

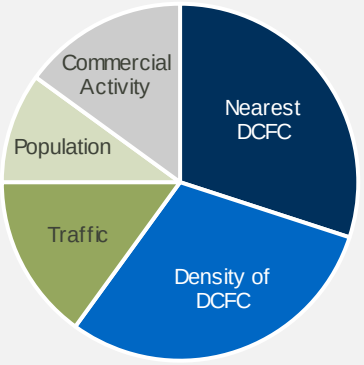
Through Traffic Method

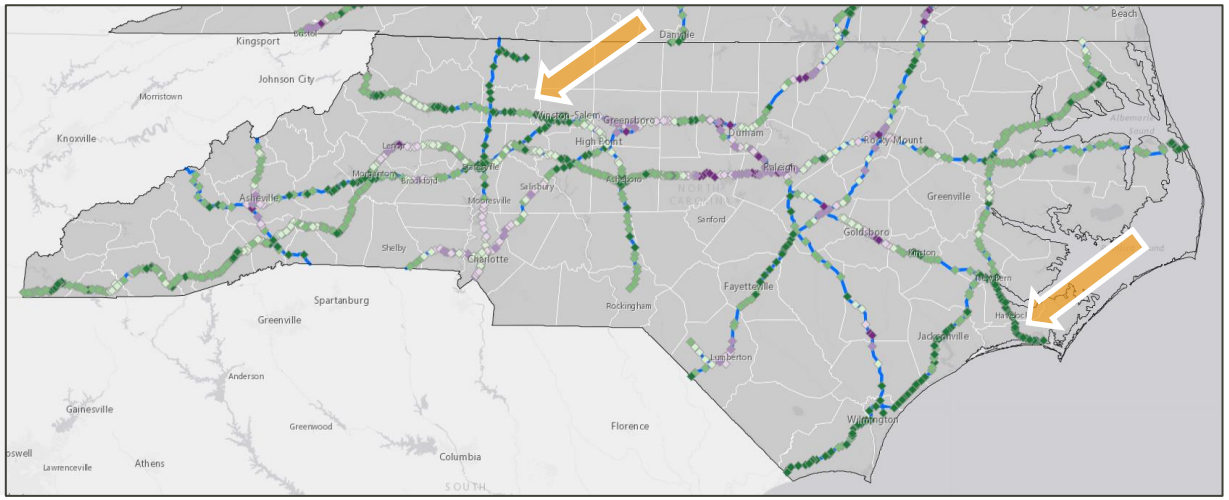




Low Suitability ◆ ◆ ◆ ◆ ◆ ◆ High Suitability

Fill Gaps Method





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Additional Siting Considerations

Network Interoperability

Electric System Capability

Funding Sources and Partnerships

Regional Coordination

Questions?

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