TCI DCFC Location Tool and Map

DVRPC Mid-Atlantic EV Charging Infrastructure Summit
April 30, 2019
Contents

• Overview & Analysis Goals

• Methodology

• Tool Dashboard & Map

• Application & Future Development
Support states and other stakeholders in assessing fast charging along transportation corridors and future DCFC development planning.
MJB&A utilized ArcGIS to analyze over 9,000 miles of key PEV corridors in the 12-state Transportation & Climate Initiative (TCI) region (including D.C.).

- **Assessed DCFC opportunities along all designated federal corridors plus additional state-priority corridors**
- **Existing DCFC network included public, non-proprietary (e.g., Tesla) infrastructure within 5 miles of selected roadways**
- **Focused on highway exits, toll road service plazas, and other key intersections as potential sites for corridor fast charging**
- **Worked with analysis-region state participants to refine dataset, parameters, and metrics**
Inputs: Key Metrics

- **Proximity to Existing Charging**: Distance to nearest DCFC station and density of existing charging ports
- **Traffic Density**: Annual average daily traffic volume of roadway segment
- **Commercial Activity**: Number of restaurants, bars, and gas stations w/in 1 mile of each exit
- **Population**: Population density of surrounding census tract
Methodology Overview

- Exits/nodes are compared to all other selected exits within each metric
- Score between 1 and 10 is given to each metric of each exit
  - Exit could score 1 for population density (i.e., very low population) but a 10 for proximity (i.e., there are no/few existing DCFC nearby)
- Metric decile designations are combined to assign one cumulative score for each exit; all scores are then ranked
- Tool allows user to adjust the weight/importance of each metric to reflect personalized priorities

<table>
<thead>
<tr>
<th>Metric</th>
<th>Metric Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximity (Nearest)</td>
<td>Nearest DCFC is close</td>
</tr>
<tr>
<td>Proximity (Density)</td>
<td>Many DCFC ports nearby</td>
</tr>
<tr>
<td>Traffic Volume</td>
<td>Low traffic volume near node</td>
</tr>
<tr>
<td>Pop. Density</td>
<td>Low population density near node</td>
</tr>
<tr>
<td>Comm. Activity</td>
<td>Few points of interest w/in 1 mile of exit</td>
</tr>
</tbody>
</table>
Tool Dashboard

Tool Dashboard Options

Region
12-state (w/ D.C.) TCI region, state, or county

Exit Group
All nodes (including or excluding service plazas) in selected region OR nodes of specific roadway in region

Weighting Method
Pre-loaded metric weighting or custom/user-defined weights

Weighting Values
Metric weights corresponding to selected weighting method

Infrastructure Location Identification Tool

Region
Select State/Region
Filter by County (optional)
Select County
Total Region

Exit Group
Select Exit Type
Select Corridor
All Exits (with service plazas)
# Exits Ranked:
7,058

Weighting Method
Pre-Weighted Method
Custom Weighting
Through Traffic
Metric Priority:
OFF
Demand

Weighting Values

<table>
<thead>
<tr>
<th>Pre-Weighted Method Priorities:</th>
<th>Proximity</th>
<th>Weights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through Traffic: Traffic volume &amp; commercial activity</td>
<td>Closest DCFC</td>
<td>Method</td>
</tr>
<tr>
<td>Port Density</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Total Demand</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>30%</td>
<td>40%</td>
</tr>
<tr>
<td>High Traffic Gaps: Traffic volume &amp; proximity</td>
<td>Traffic Volume</td>
<td>30%</td>
</tr>
<tr>
<td>Population Density</td>
<td>Total</td>
<td>10%</td>
</tr>
<tr>
<td>Traveler Use: Traffic volume &amp; commercial activity</td>
<td>Convenience</td>
<td>40%</td>
</tr>
<tr>
<td>Resident Use: Population density &amp; commercial activity</td>
<td>Nearby Commercial Activity</td>
<td>30%</td>
</tr>
<tr>
<td>Even: Metrics weighted evenly</td>
<td>Total</td>
<td>30%</td>
</tr>
</tbody>
</table>

Total
100% 100%

Calculate Rankings Go
Ranking/Weighting Methods

Proximity Metrics
- Nearest DCFC
- DCFC Port Density

Demand Metrics
- Traffic Volume
- Population Density

Convenience Metrics
- Commercial Activity

1. Through Traffic
2. Fill Gaps
3. High Traffic Gap
4. Traveler Use
5. Resident Use
6. Even

Custom
User-Defined
The Visualization Map allows the user to see all metric data (e.g., population density and traffic volume) as well as scenario outputs from the spreadsheet tool to compare possible locations for DCFC infrastructure deployment.

Through Traffic Method

Fill Gaps Method

Filter Function
Allows user to filter and view exits by metric criteria

Filter Exits & DCFC by Metrics

- Turn on "All Exits..." Layer
- Select State(s)
- Select County(ies)
- Select Highway(s)
- Select Node Type(s)
- Distance (miles) to closest DCFC is at least:
- Traffic volume (AADT) is at least:
- Population density (pop/sq mile) is at least:
- No. of nearby commercial establishments is at least:
  (restaurants, pubs, & gas stations within 1 mile)
Application and Future Work

Current & Potential Application
- Initial scoping analysis to inform state infrastructure development initiatives and funding proposals
  - NH DES & EVolve NY
- Support for Public Utilities Commission electric vehicle proceedings
- Utility or private developer review/comparison of potential development locations

Future Development
- Electric utility infrastructure and distribution network considerations
- Demand charge rate structures
- Additional corridors and L2 integration
Tools are available for free from either M.J. Bradley & Associates or Georgetown Climate Center websites (version 3.0 scheduled for summer 2019 release)

www.mjbradley.com

www.georgetownclimate.org