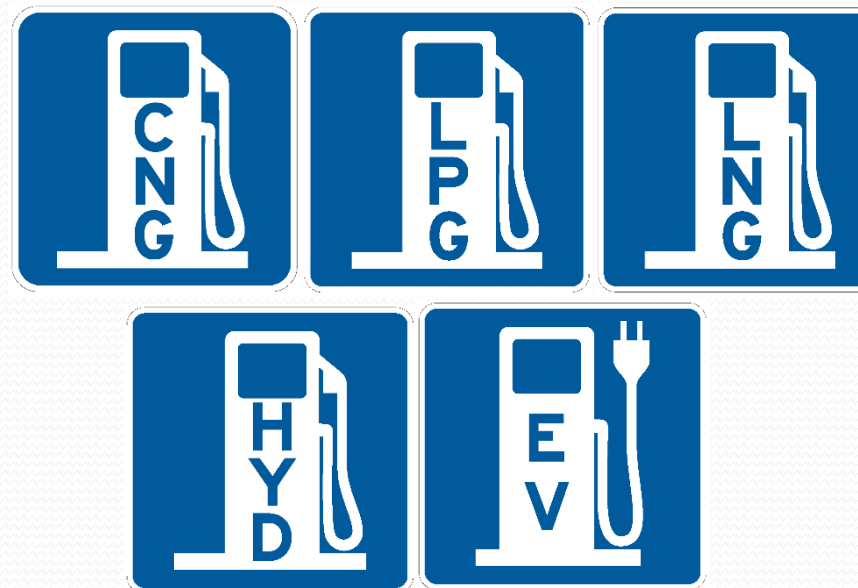


# Designated Corridors and Infrastructure Gap Analysis



Mike Scarpino & Stephen Costa  
USDOT – Volpe Center  
June 12, 2018

# Agenda

- Alternative Fuel Corridors Infrastructure Analysis
  - ✓ Minnesota and Indiana examples
    - ✓ EV and CNG
    - ✓ Current stations
    - ✓ VMT & Freight data
    - ✓ Gap Analysis Example
    - ✓ Round 3 Designation Recommendations
  - ✓ Summary

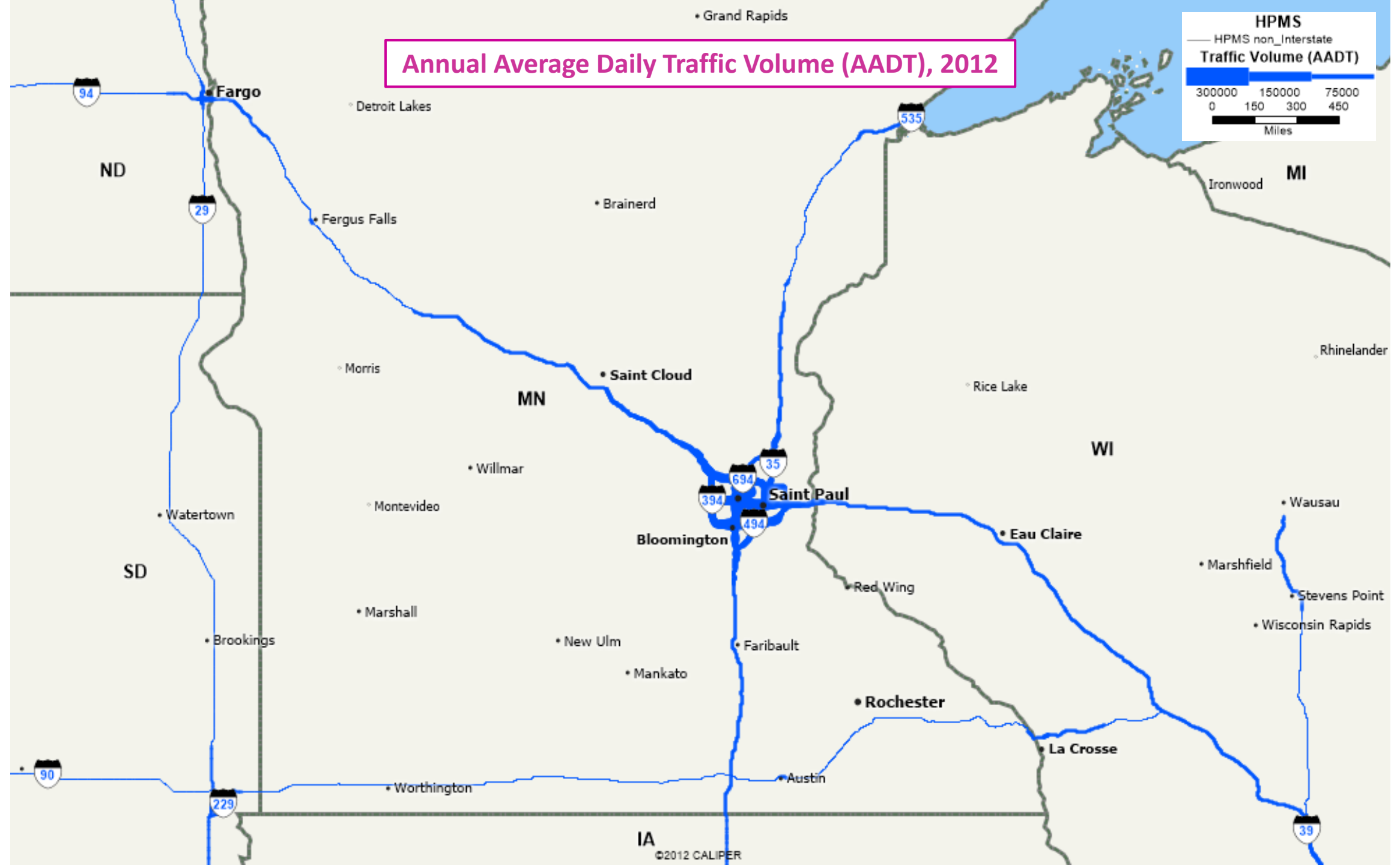


# Annual Average Daily Traffic Volume (AADT), 2012

**HPMS**  
— HPMS non\_Interstate  
**Traffic Volume (AADT)**

300000	150000	75000	
0	150	300	450

Miles



# MN Corridor Analysis for Annual Average Daily Traffic Volume

State	Hwy	Origin	Destination	AADT 2012	AADT 2045	Percent Increase
MN	I-35	MN/IA border	Duluth	32340	57804	79%
MN	I-94	MN/WI border	MN/ND border	76969	88514	15%
MN	I-90	MN/WI border	MN/SD border	11641	27104	133%
MN	I-35/ I35W	Entire Highway	Entire Highway	58479	122711	110%
MN	I-494/ I-694	Entire Highway	Entire Highway	102727	122550	19%

# Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. For state information, see [stations data by state](#).

Find Public Stations

Analyze & Download Data

MN

Electric

Level 1

Level 2

DC Fast Charging



Map a Route

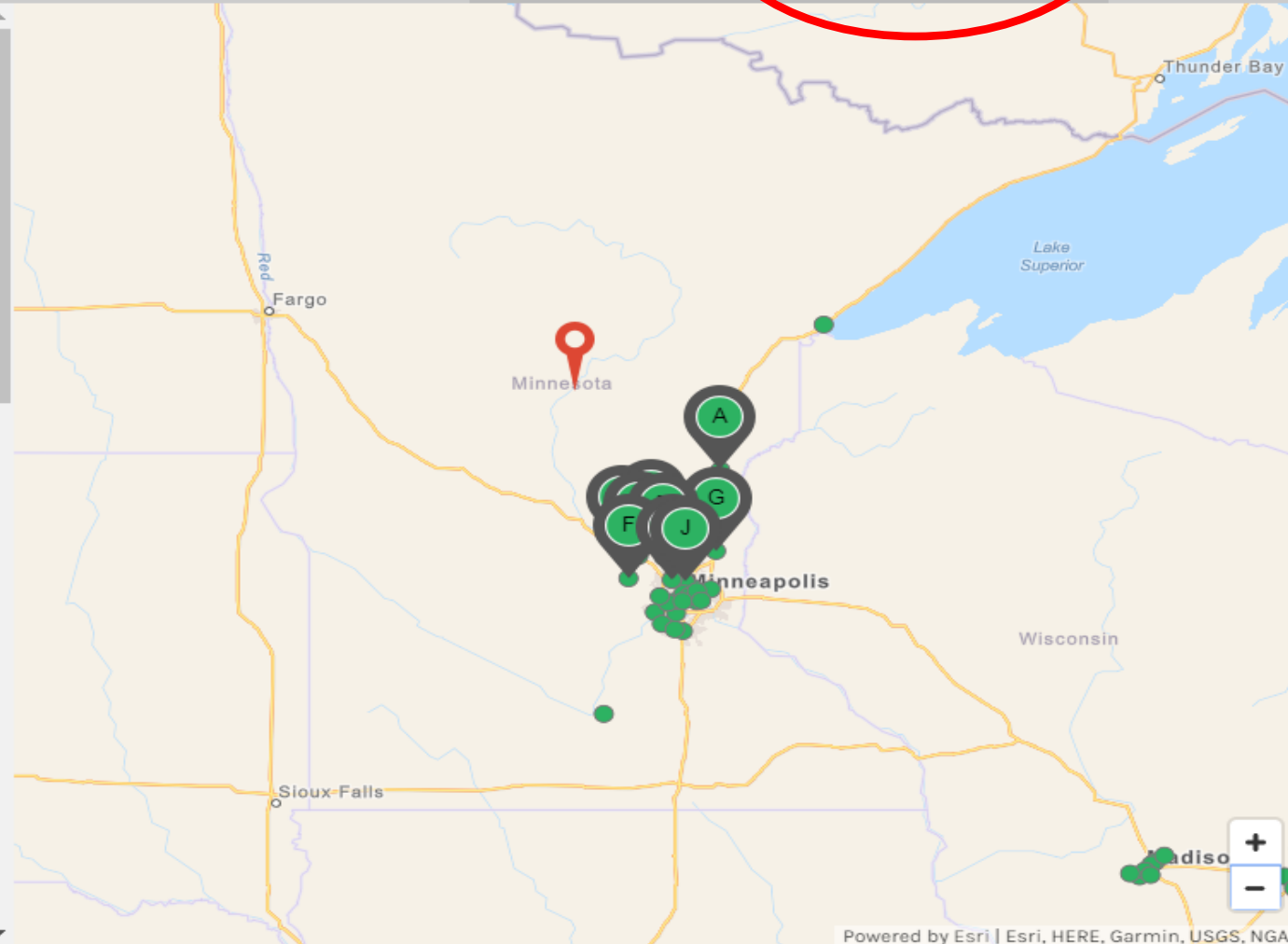
**A** Family Pathways 69.4 mi  
800 Main St S  
Pine City, MN 55063  
DC Fast

**B** Goodwill 75.7 mi  
3991 Cedar St  
Monticello, MN 55362  
DC Fast

**C** ERMU STATIONS 77.3 mi  
19425 Evans St NW  
Elk River, MN 55330  
DC Fast

**D** Albertville Premium Outlet Mall 80.6 mi  
6364 Labeaux Ave NE  
Albertville, MN 55301  
DC Fast

**E** Connexus 85.0 mi



# Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. For state information, see [stations data by state](#).

Find Public Stations

Analyze & Download Data

MN

Electric

Level 1

Level 2

DC Fast Charging



CHAdeMO



CCS



Tesla

Map a Route

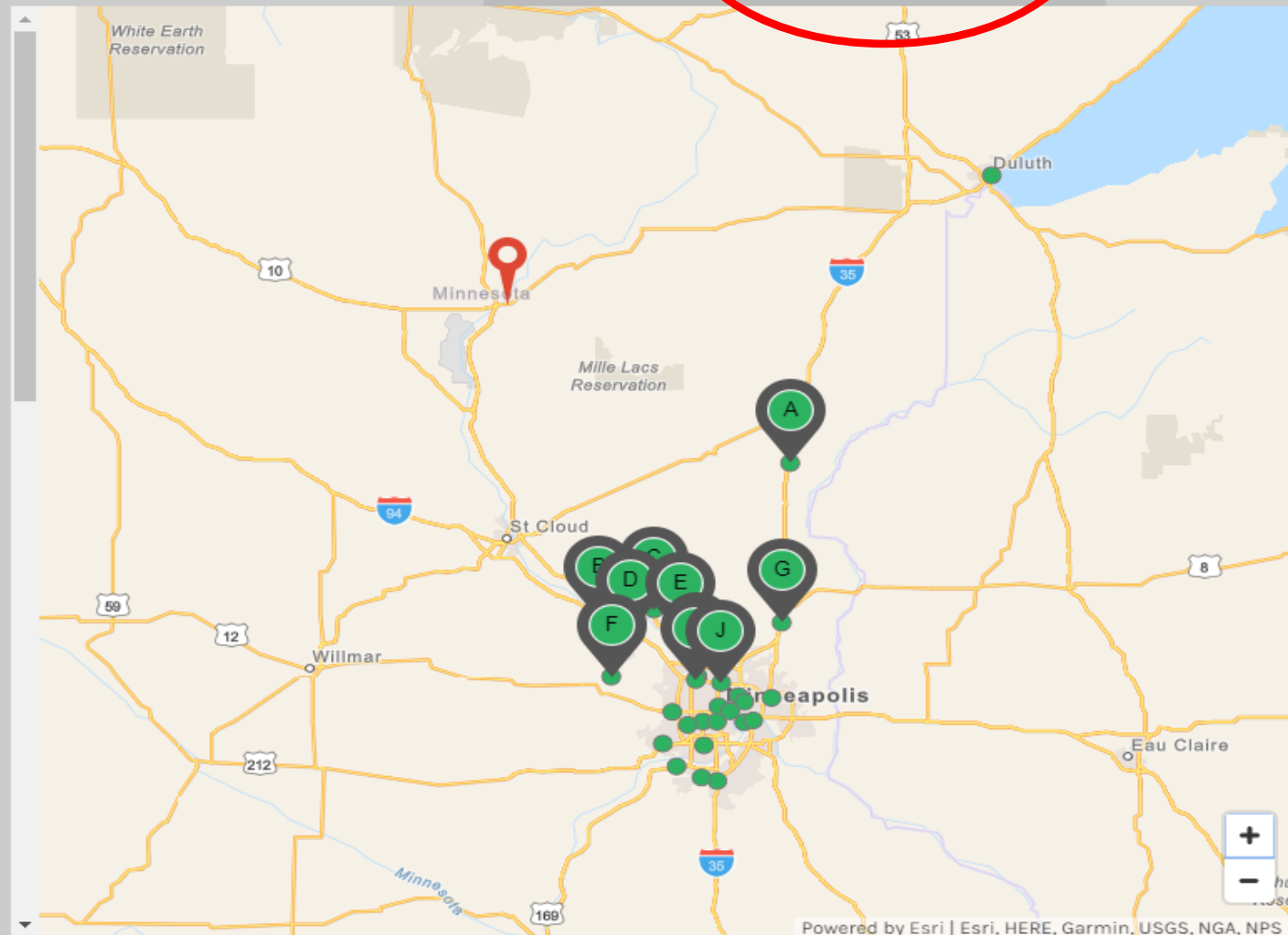
**A** Family Pathways 69.4 mi  
800 Main St S  
Pine City, MN 55063  
DC Fast

**B** Goodwill 75.7 mi  
3991 Cedar St  
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MN

Electric

Level 1

Level 2

DC Fast Charging



CHAdemo



CCS



Tesla

Map a Route

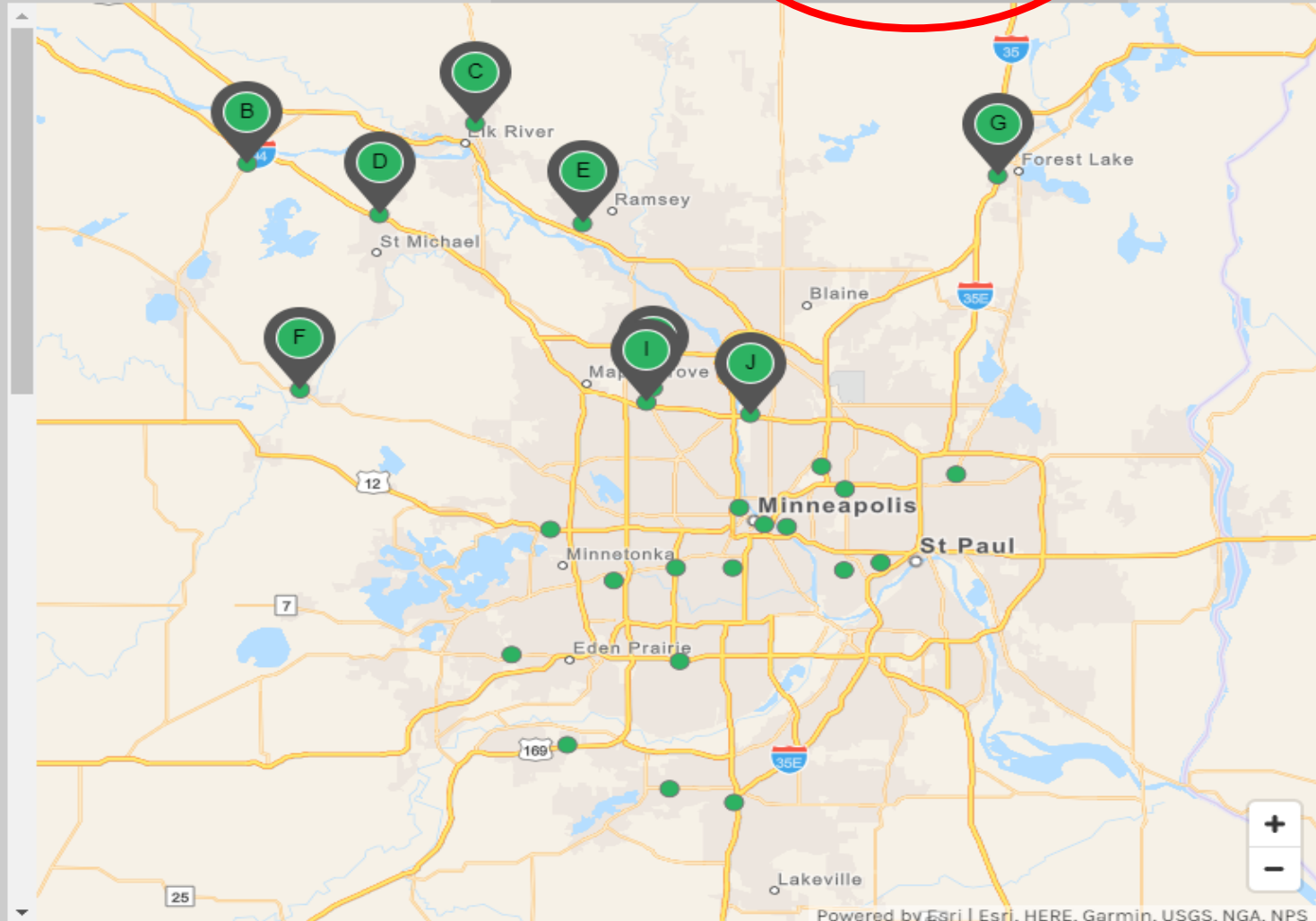
**A** Family Pathways 69.4 mi  
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DC Fast

**B** Goodwill 75.7 mi  
3991 Cedar St  
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19425 Evans St NW  
Elk River, MN 55330  
DC Fast

**D** Albertville Premium Outlet Mall 80.6 mi  
6364 Labeaux Ave NE  
Albertville, MN 55301  
DC Fast

**E** Connexus 85.0 mi



# EV AFC's: Rounds 1 and 2

**Alternative Fuel Corridors**

- EV - Corridor Ready
- EV - Corridor Pending

0 10 20 30  
Miles





# EV Corridor Opportunities

**Alternative Fuel Corridors**

- EV - Corridor Ready
- EV - Corridor Pending

0 10 20 30  
Miles



# EV Corridor Opportunities

**Alternative Fuel Corridors**

- EV - Corridor Ready
- EV - Corridor Pending

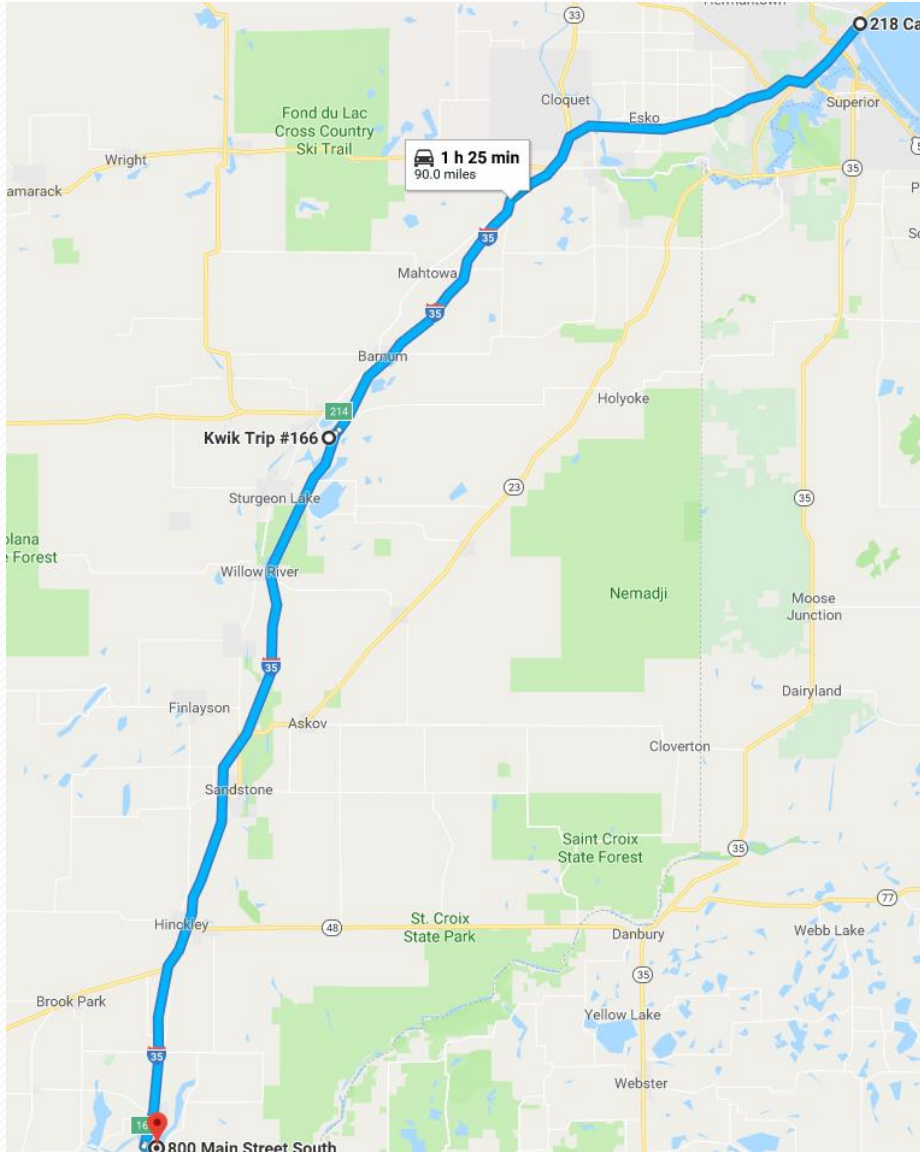
0 10 20 30  
Miles



# MN EV Corridor Analysis for Future Designations

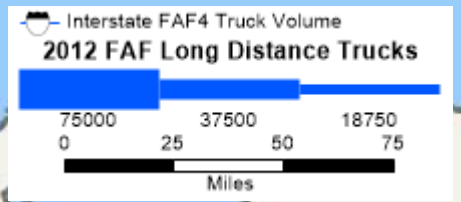
State	EV Ready	EV Pending	Additional Recommendations
MN	<b>I-35:</b> From Pine City to Burnsville (83 miles)	<b>I-35:</b> From MN/IA border to Burnsville; and from Duluth to Pine City	<b>I-90:</b> Evaluate priority for DCFC installations

# Simple Gap Analysis Example for Minnesota on I-35

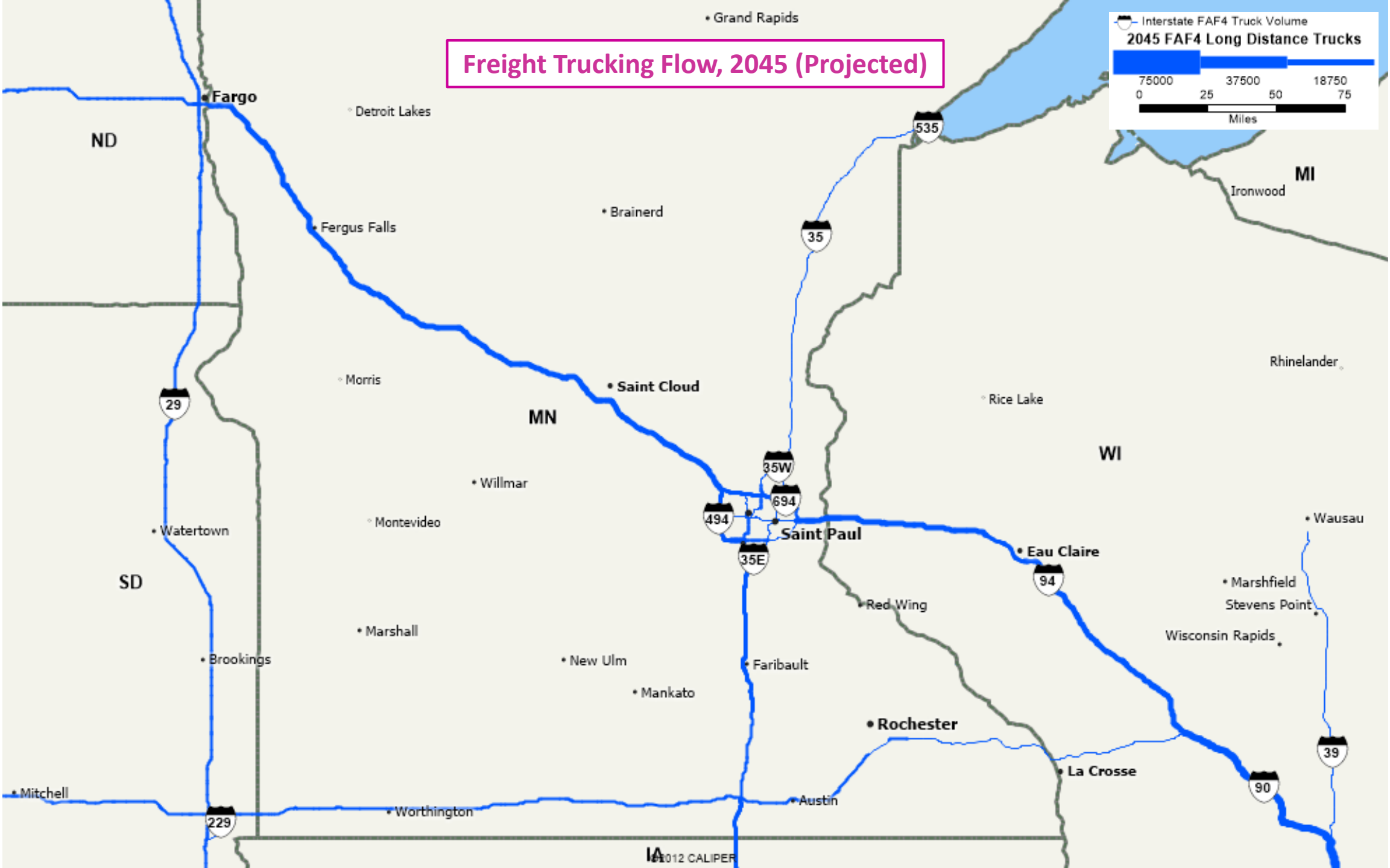
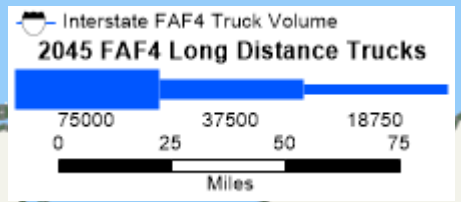


- Current Gap between Family Pathways in Pine City and the City of Duluth's DCFC is 90 miles
- Installing a DCFC at Kwik Trip #166 on Opportunity Dr. in Moose Lake would create 43.4 mile and 46.6 mile segments and extend the corridor/close the gap

# Freight Trucking Flow, 2012



# Freight Trucking Flow, 2045 (Projected)



# MN Corridor Analysis for Long Distance Truck Volume

State	Hwy	Origin	Destination	FAF4 2012	FAF4 2045	Percent Increase
MN	I-35	MN/IA border	Duluth	3069	5572	82%
MN	I-94	MN/WI border	MN/ND border	6600	10758	63%
MN	I-90	MN/WI border	MN/SD border	3624	6899	90%
MN	I-35/ I35W	Entire Highway	Entire Highway	8904	16373	84%
MN	I-494/ I-694	Entire Highway	Entire Highway	5322	8557	61%

# Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. For state information, see [stations data by state](#).

Find Public Stations

Analyze & Download Data

MN

Compressed Natural Gas

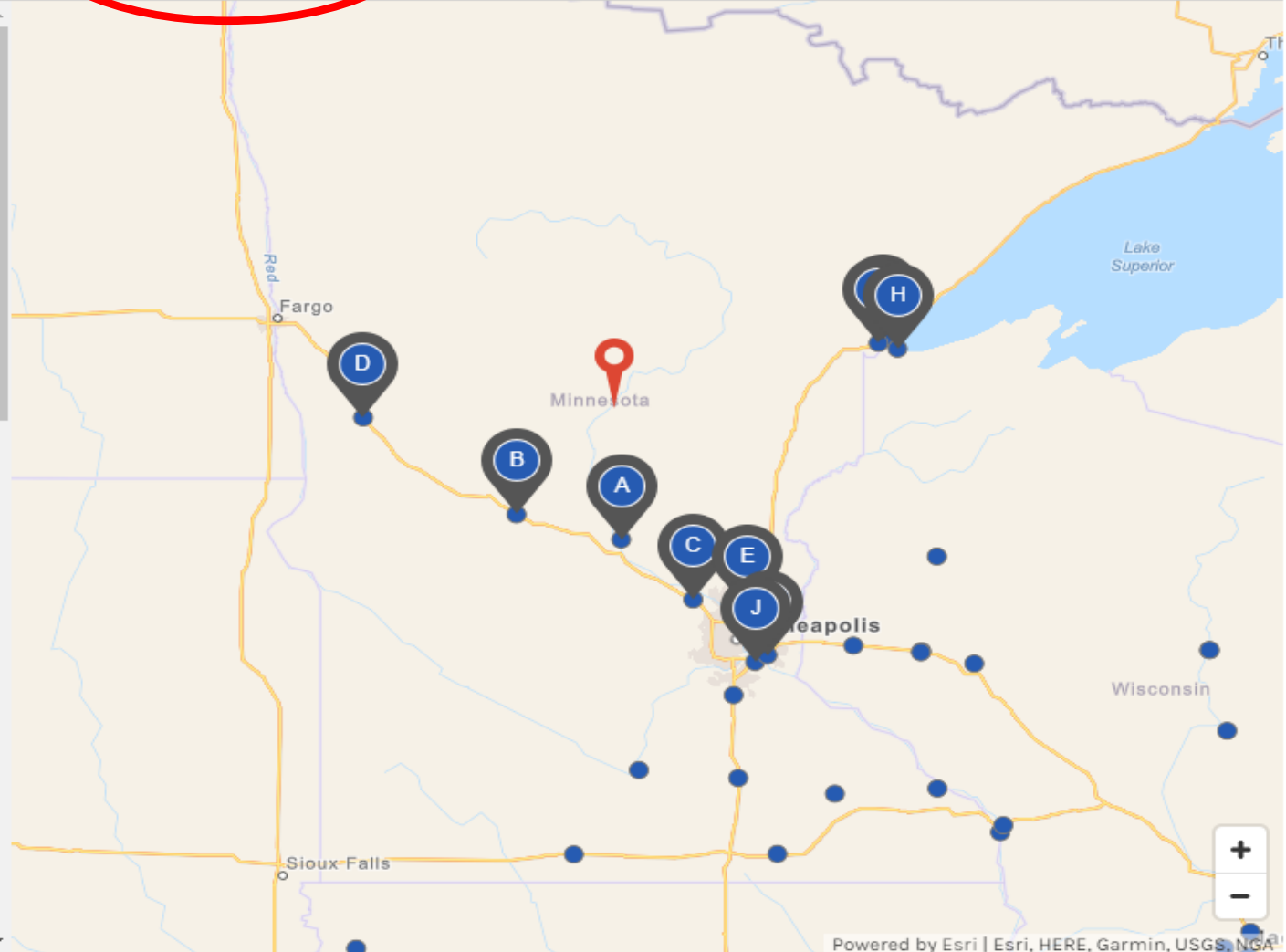
Map a Route

**A** St. Cloud 53.5 mi  
Metro Bus  
665 Franklin Ave  
St. Cloud, MN 56304

**B** Trillium - 56.3 mi  
Northwest Family Physician  
S  
1142 Fairlane Dr  
Sauk Centre, MN 56378

**C** Kwik Trip 83.3 mi  
#681  
4400 O'Day Ave NE  
St. Michael, MN 55376



**D** GAIN 92.0 mi  
Clean Fuel - Fergus Falls  
1235 Frontier Dr  
Fergus Falls, MN 56537



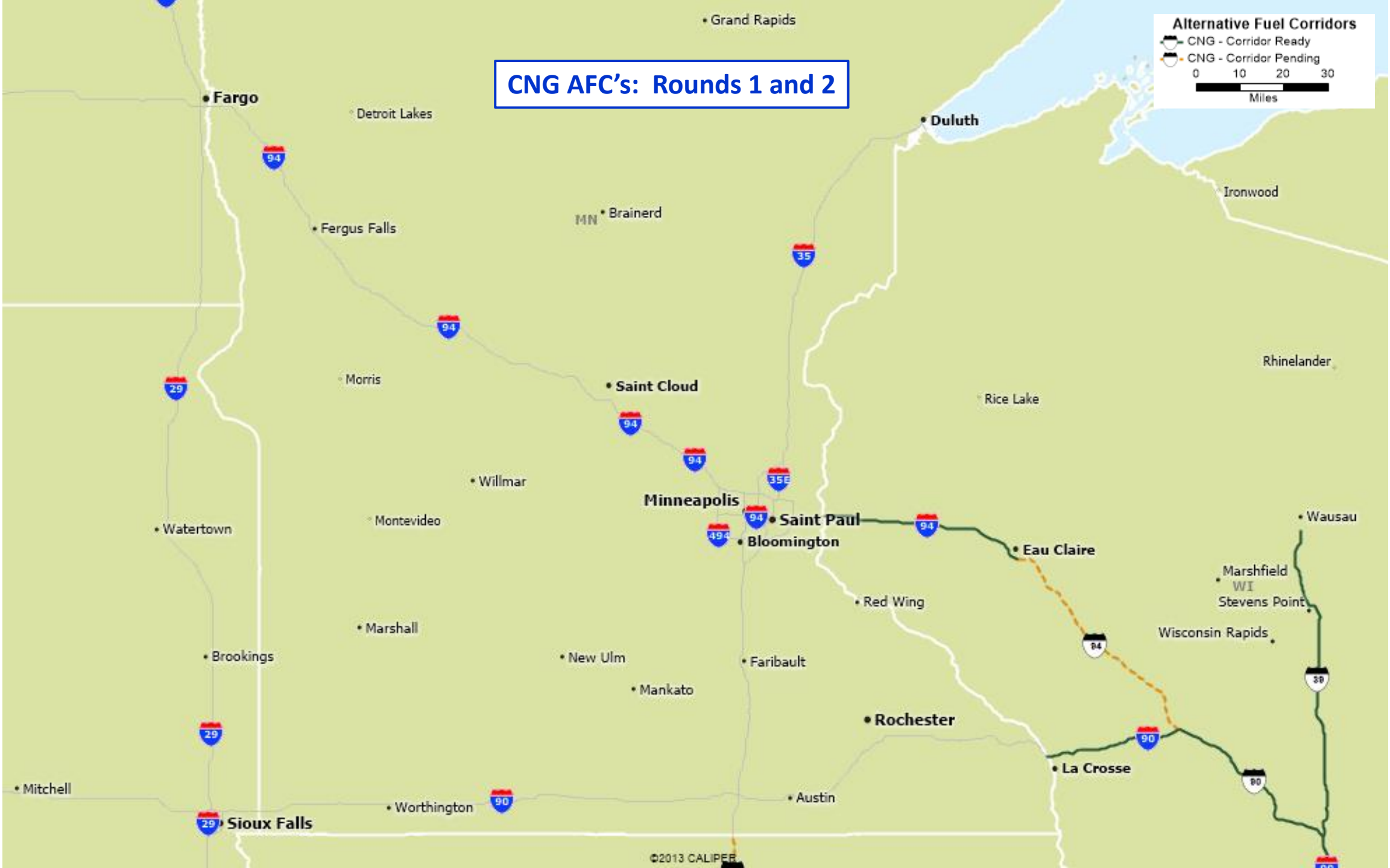


# CNG AFC's: Rounds 1 and 2

**Alternative Fuel Corridors**



-  CNG - Corridor Ready
-  CNG - Corridor Pending

0 10 20 30  
Miles



# CNG Corridor Opportunities

**Alternative Fuel Corridors**

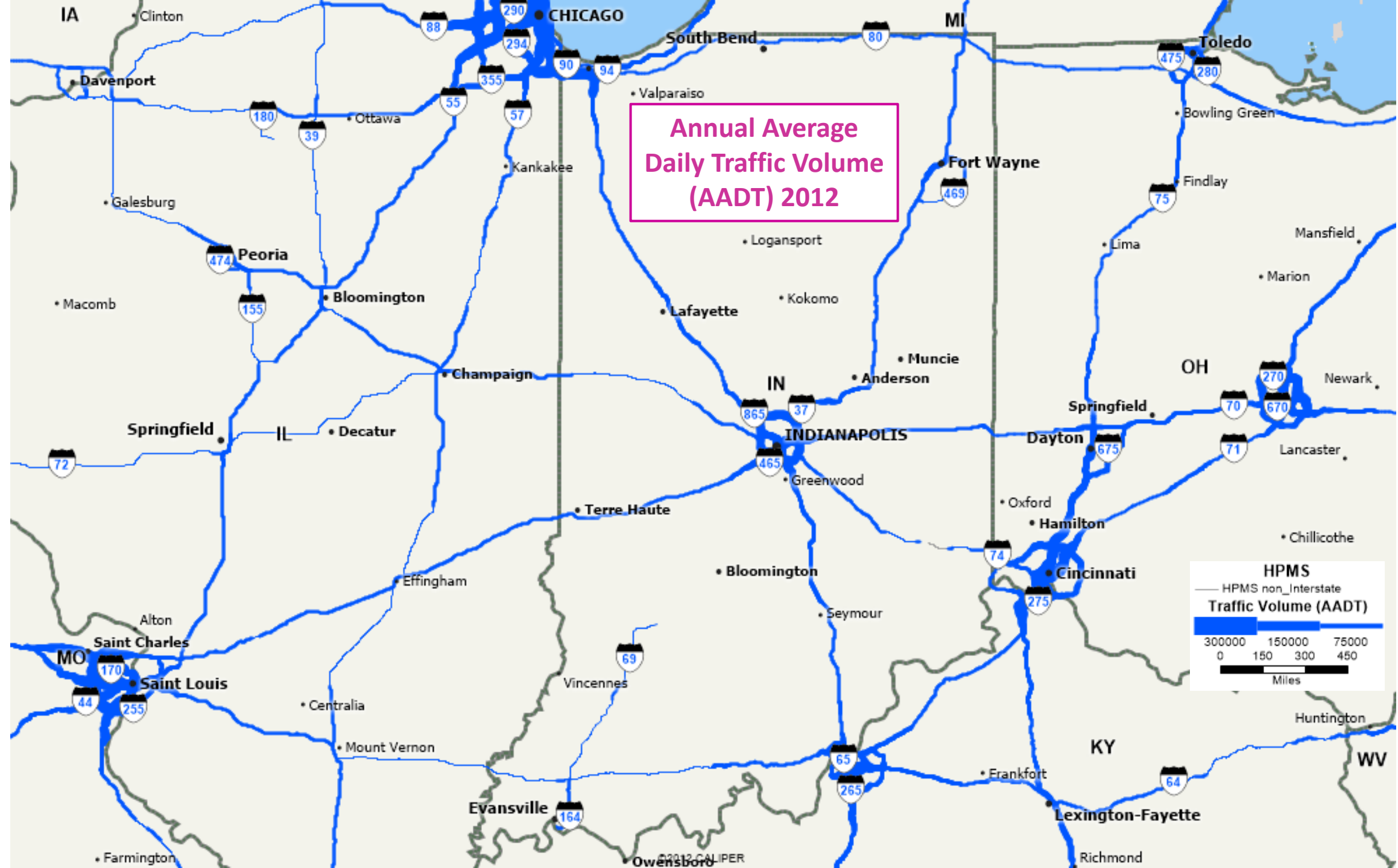
-  CNG - Corridor Ready
-  CNG - Corridor Pending

0 10 20 30  
Miles



# MN CNG Corridor Analysis for Future Designations

State	CNG Ready	CNG Pending	Additional Recommendations
MN	<p><b>I-35:</b> From Duluth to Owatonna (207 miles)</p> <p><b>I-90:</b> From Fairmont to MN/WI border (180 miles)</p> <p><b>I-94:</b> From Fergus Falls to MN/WI border (227 miles)</p>	<p><b>I-35:</b> From Owatonna to MN/IA border</p> <p><b>I-90:</b> From Fairmont to MN/SD border</p> <p><b>I-94:</b> From Fergus Falls to MN/ND border</p>	



# IN Corridor Analysis for Annual Average Daily Traffic Volume

State	Hwy	Origin	Destination	AADT 2012	AADT 2045	Percent Increase
IN	I-80	IL/IN border	IN/OH border	51058	255454	400%
IN	I-65	Gary	IN/KY border	63264	311790	393%
IN	I-94	IN/MI border	IN/IL Border	56340	281881	400%
IN	I-69	Indianapolis	IN/MI Border	30178	150988	400%

# Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. For state information, see [stations data by state](#).

Find Public Stations

Analyze & Download Data

IN

Electric

Level 1

Level 2

DC Fast Charging



CHAdeMO



CCS



Tesla

Map a Route

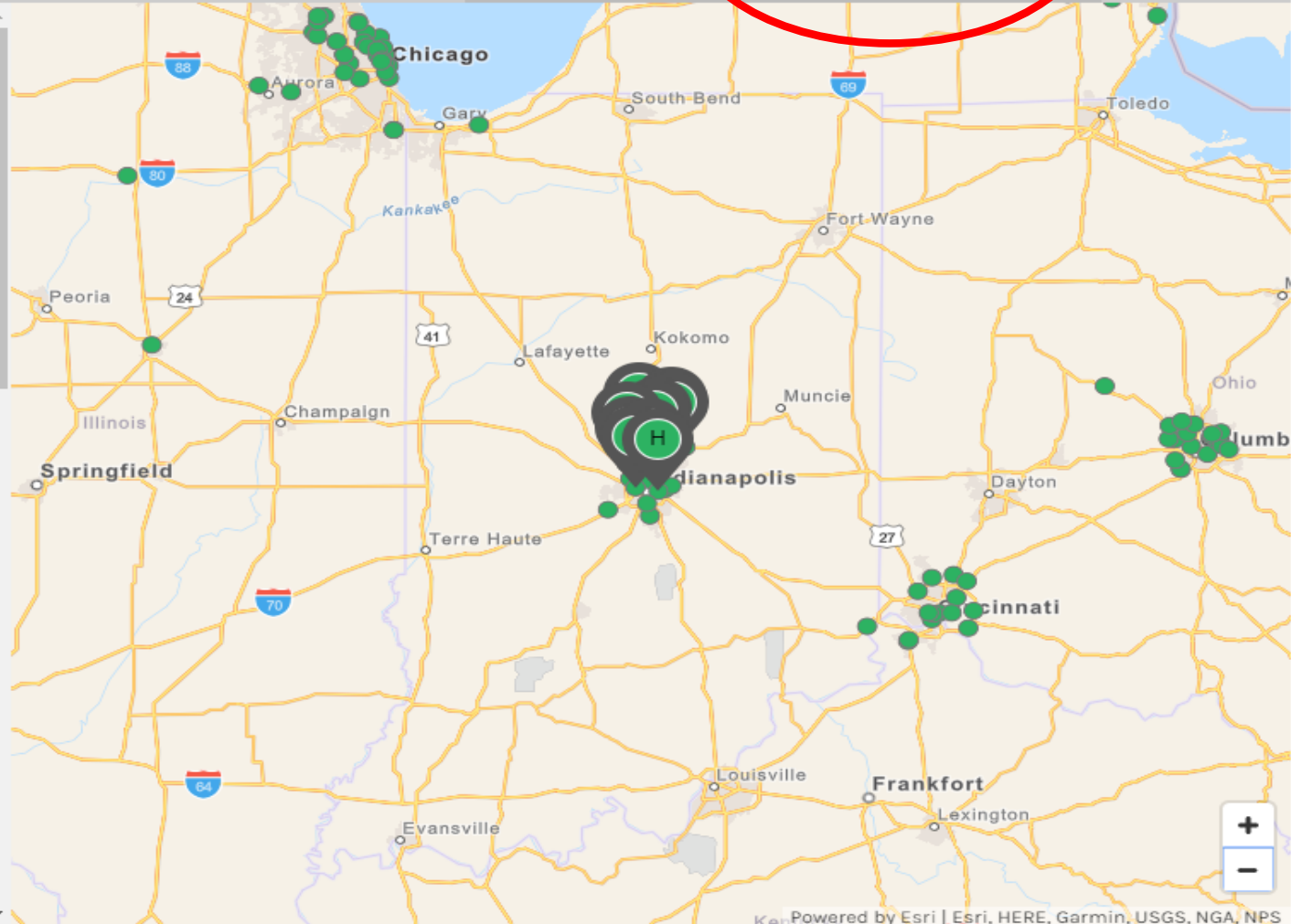
**A** Ricker's 1.1 mi  
8558 NW Blvd  
Indianapolis, IN  
46278  
DC Fast

**B** Andy Mohr Nissan 6.3 mi  
4302 Lafayette Rd  
Indianapolis, IN  
46254  
Level 2, DC Fast

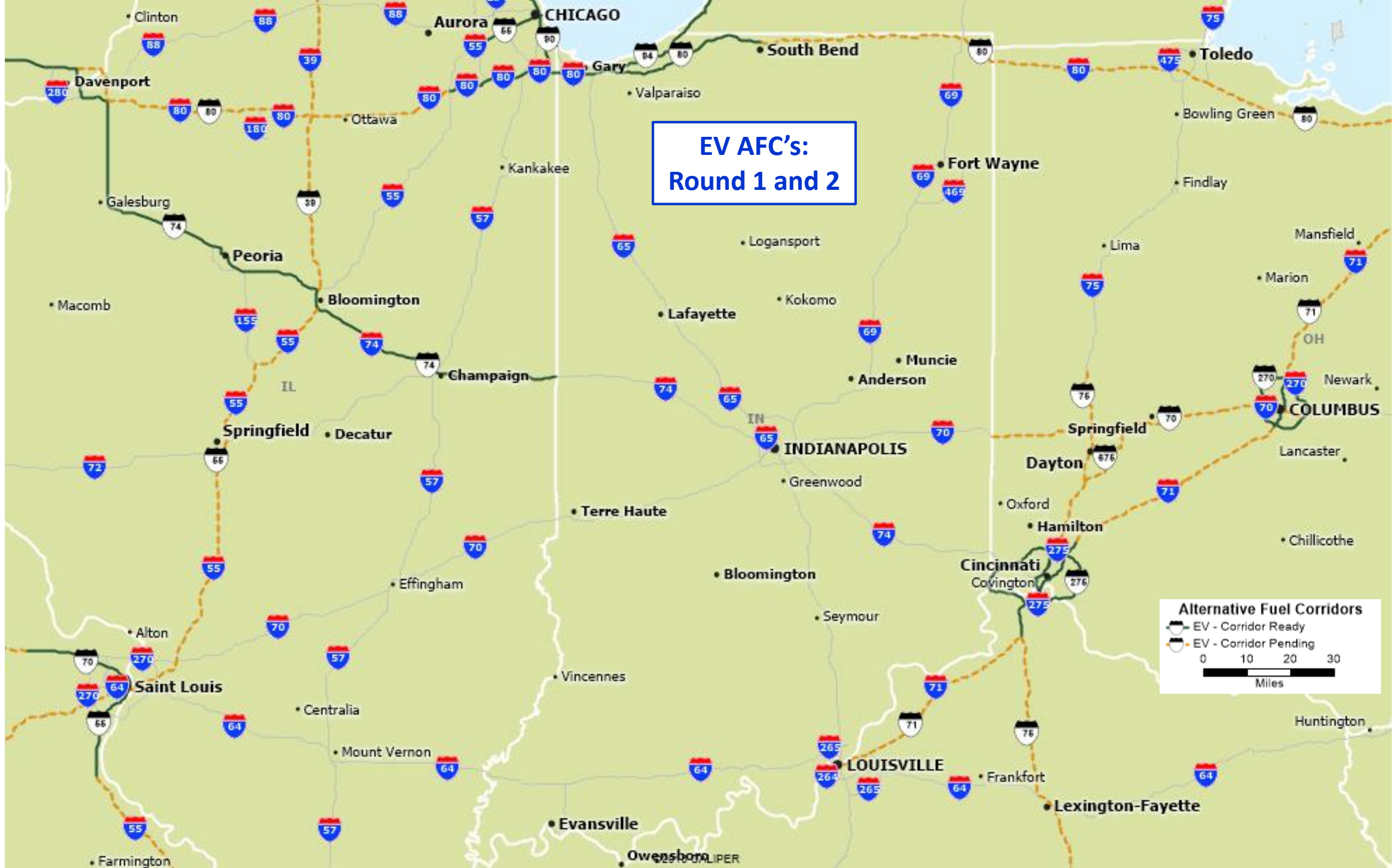
**C** Ricker's 7.6 mi  
1850 151st St  
Carmel, IN 46033  
DC Fast

**D** Fashion Mall (East) 9.3 mi  
8702 Keystone Xing  
Indianapolis, IN  
46240  
Level 2, DC Fast

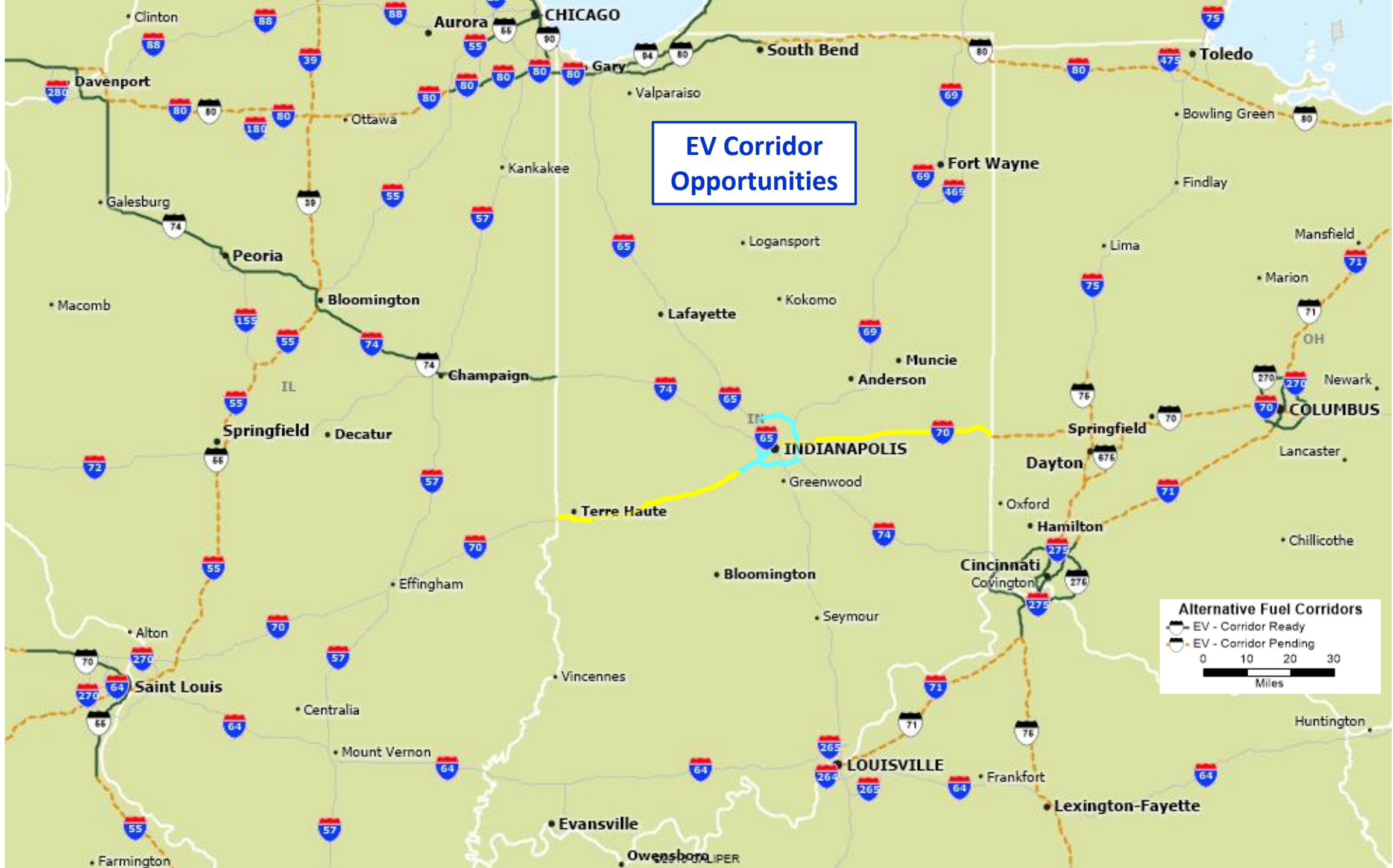
**E** Tom Wood Nissan 9.6 mi



# EV AFC's: Round 1 and 2

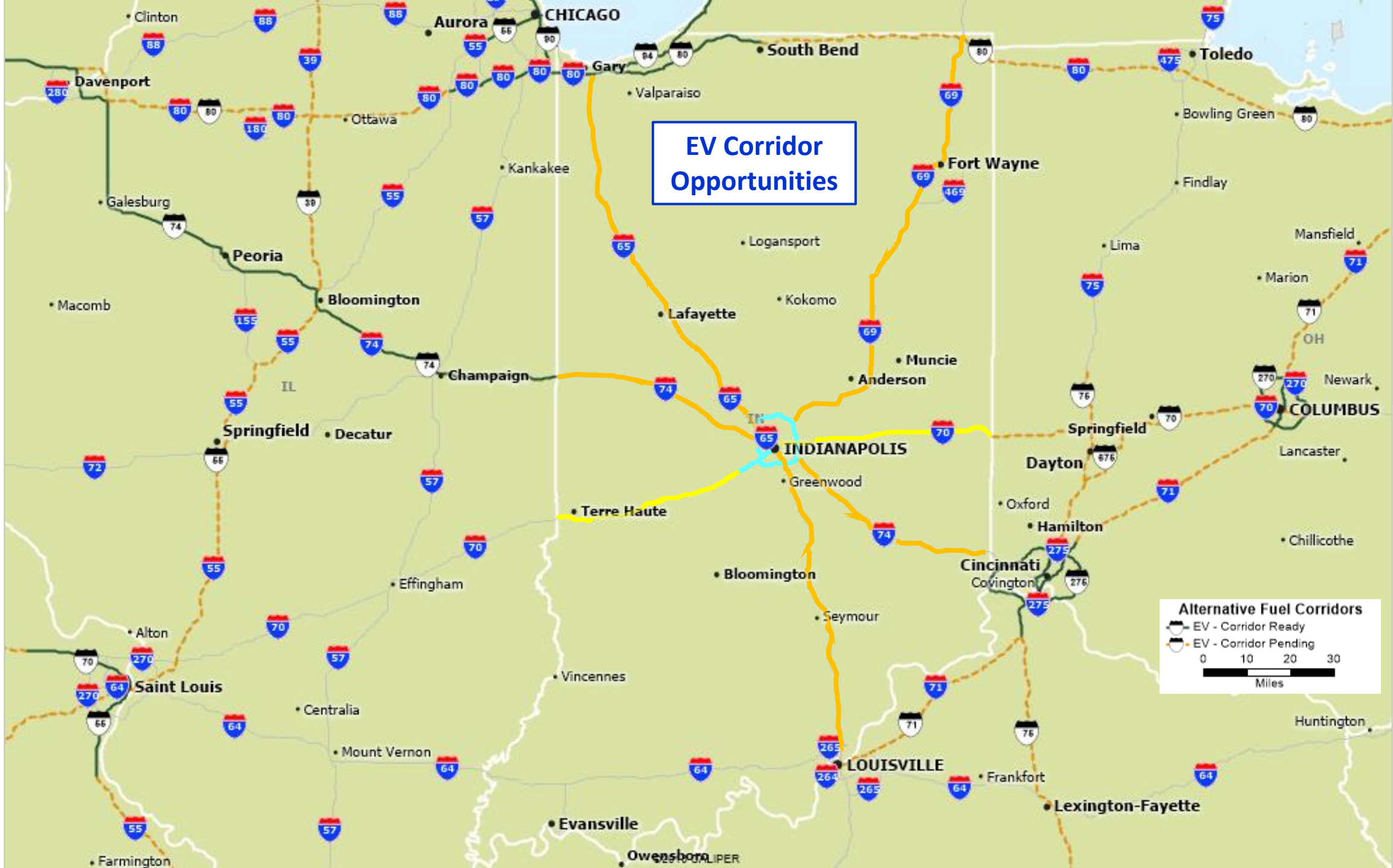


# EV Corridor Opportunities





# EV Corridor Opportunities



**Alternative Fuel Corridors**

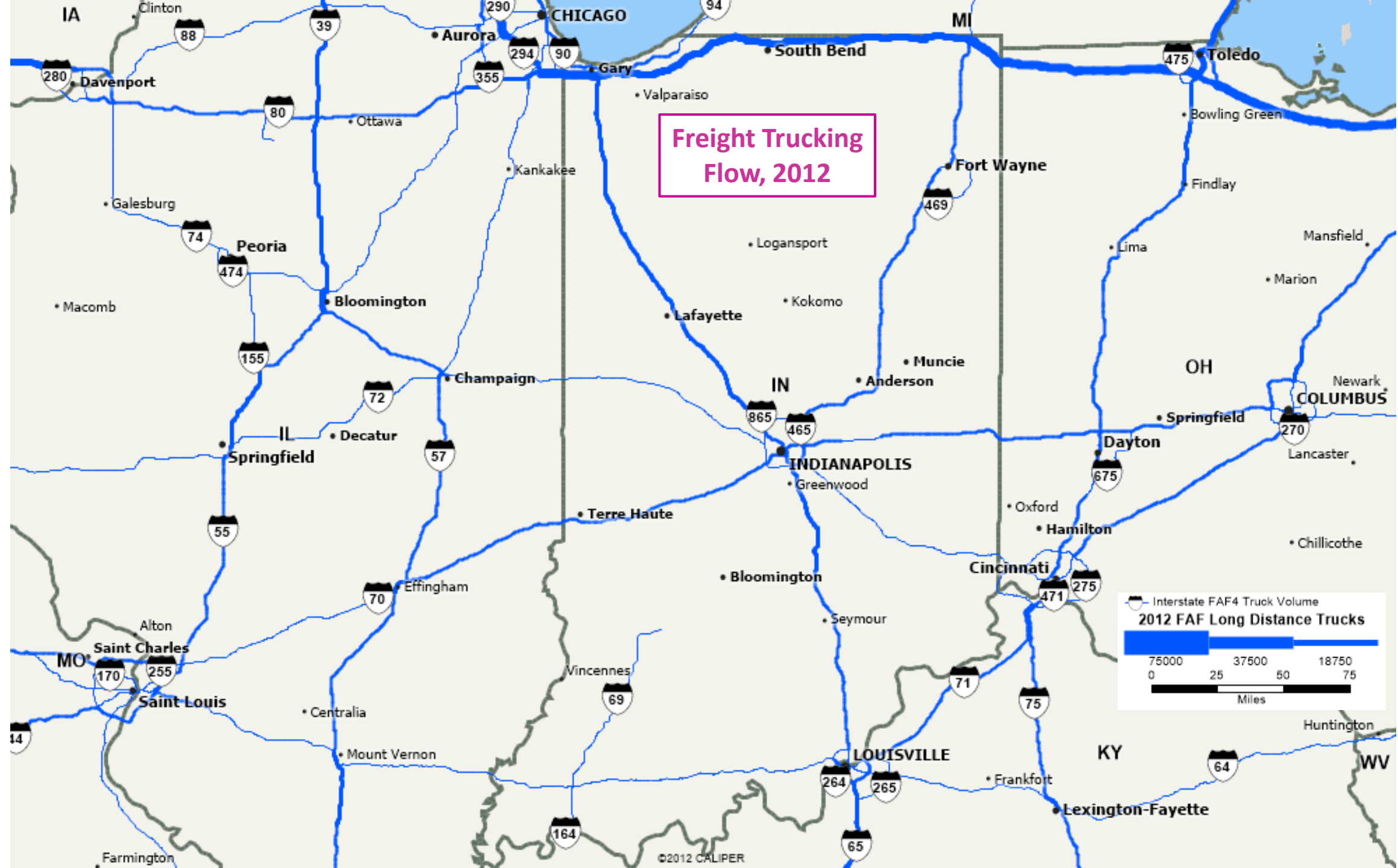
- EV - Corridor Ready
- EV - Corridor Pending

0 10 20 30  
Miles

# IN EV Corridor Analysis for Future Designations

State	EV Ready	EV Pending	Additional Recommendations
IN	<b>I-465:</b> Entire Loop <b>I-70:</b> From Indianapolis to Plainfield (25 miles)	<b>I-70:</b> From IN/OH border to Indianapolis; and from Plainfield to IN/IL border	<b>I-65:</b> Nominate as EV Pending <b>I-69:</b> Evaluate priority for DCFC installations <b>I-74:</b> Evaluate priority for DCFC installations

# Freight Trucking Flow, 2012



# Freight Trucking Flow, 2045 (Projected)



# IN Corridor Analysis for Long Distance Truck Volume

State	Hwy	Origin	Destination	FAF4 2012	FAF4 2045	Percent Increase
IN	I-80	IL/IN border	IN/OH border	20700	39860	93%
IN	I-65	Gary	IN/KY border	9392	16291	73%
IN	I-94	IN/MI border	IN/IL Border	5772	9840	70%
IN	I-69	Indianapolis	IN/MI Border	5210	10831	108%

# Alternative Fueling Station Locator

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Find Public Stations

Analyze & Download Data

IN

Compressed Natural Gas

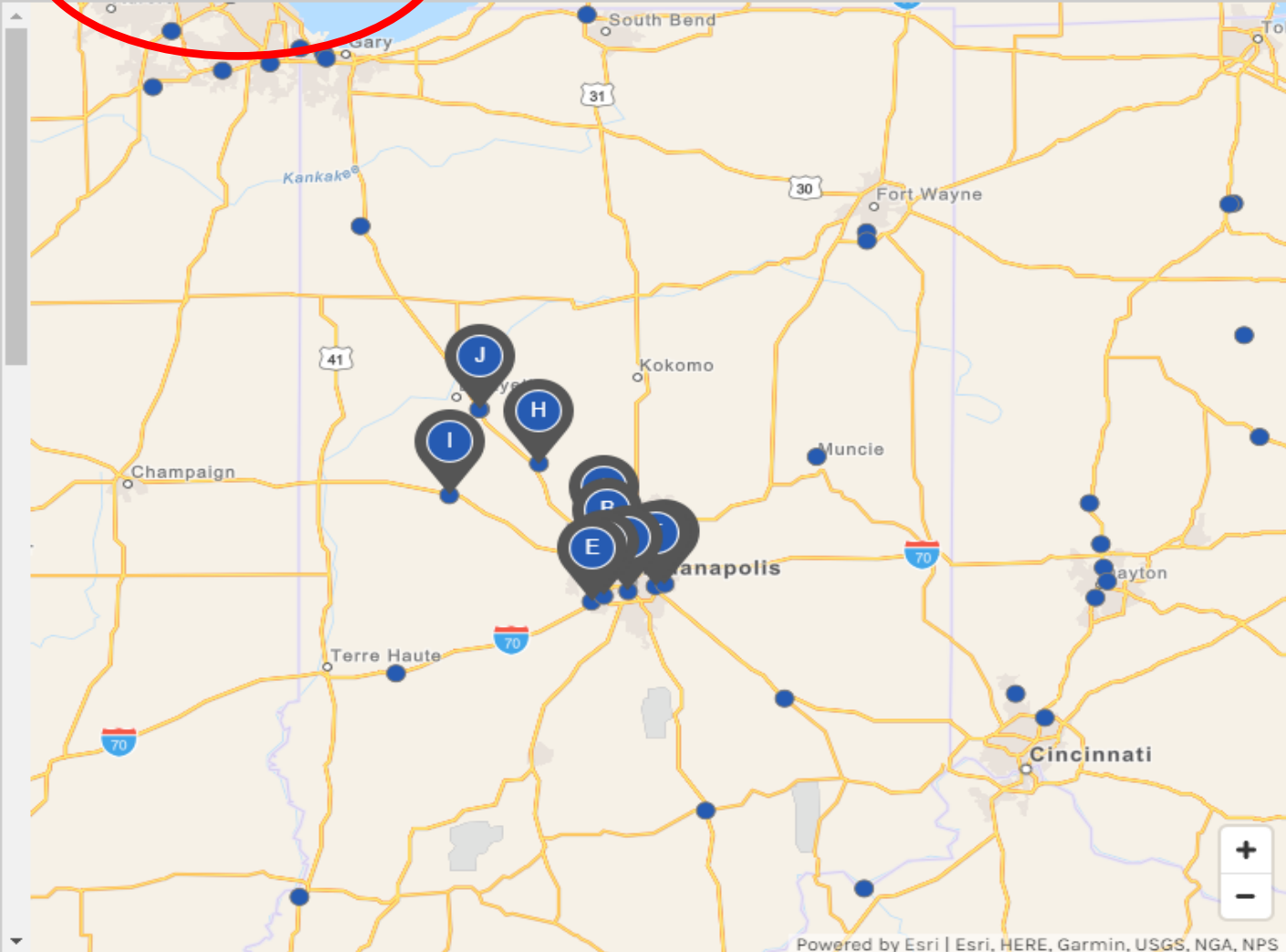
Map a Route

**A** GAIN Clean Fuel - Indianapolis  
8781 Zionsville Rd  
Indianapolis, IN 46268  
1.3 mi

**B** Kakco  
4355 Lafayette Blvd  
Indianapolis, IN 46254  
6.1 mi

**C** JEM Energy  
5925 Stockberger Pl  
Indianapolis, IN 46241  
13.8 mi

**D** CNG Source Fueling - Greene's Auto & Truck Service  
111 W Raymond St  
Indianapolis, IN  
14.2 mi





# CNG Corridor Opportunities





# CNG Corridor Opportunities



**Alternative Fuel Corridors**

- CNG - Corridor Ready
- CNG - Corridor Pending

0 10 20 30  
Miles

# IN CNG Corridor Analysis for Future Designations

State	CNG Ready	CNG Pending	Additional Recommendations
IN	<p><b>I-65:</b> From Gary to IN/KY border (275 miles)</p> <p><b>I-465:</b> Entire Loop</p> <p><b>I-94:</b> From Gary to IN/IL border</p> <p><b>I-70:</b> From Indianapolis to Brazil (57 miles)</p>	<p><b>I-94:</b> From IN/MI border to Gary</p> <p><b>I-70:</b> From IN/OH border to Indianapolis; and from Brazil to IN/IL border</p>	<p><b>I-69:</b> Nominate as CNG Pending</p> <p><b>I-74:</b> Nominate as CNG Pending</p>

# LPG Corridor Analysis for Future Designations

States	LPG Ready	LPG Pending	Additional Recommendations
MN	<p><b>I-35:</b> From Duluth to St Paul (149 miles)</p>	<p><b>I-35:</b> From St Paul to the MN/IA border</p>	<p><b>I-90:</b> Nominate as LPG Pending</p> <p><b>I-94:</b> Nominate as LPG Pending</p>
IN	<p><b>I-65:</b> From West Lafayette to IN/KY border (185 miles)</p> <p><b>I-465:</b> Entire loop</p> <p><b>I-69:</b> From Indianapolis to the IN/MI border (165 miles)</p> <p><b>I-70:</b> From Indianapolis to the IN/OH border (75 miles)</p>	<p><b>I-65:</b> From West Lafayette to I-90 intersection</p> <p><b>I-69:</b> From Bloomington to Evansville</p> <p><b>I-70:</b> From Indianapolis to IN/IL border</p>	<p><b>I-74:</b> Nominate as LPG Pending</p>

# AF Corridor Analysis Summary

- Analyze station data on corridors to identify existing stations and gaps where future stations can be located
- Review important metrics such as VMT, freight volume
- Initiate conversations with property hosts for potential station locations
- Hold workshops/meetings to identify priority corridors in the state/region
- Work with State/Planning agencies to identify potential funding
  - CMAQ Priority for EV & CNG stations on designated corridors
  - VW Appendix D EVSE Funding
- Initiate/participate in planning with neighboring states
  - Electrify America Cycle 1 and 2 development
  - ZEV MOU states & MOU for Regional EV Plan for Western States
  - Informal coordination between States & Clean Cities Coalitions

# Thanks for Your Interest from the DOT Alt Fuel Corridor Team !

## **Diane Turchetta**

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Federal Highway Administration  
202-493-0158  
[diane.turchetta@dot.gov](mailto:diane.turchetta@dot.gov)

## **Mike Scarpino**

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617-494-3373  
[michael.scarpino@dot.gov](mailto:michael.scarpino@dot.gov)

## **Stephen Costa**

U.S. Department of Transportation  
Volpe Center  
617-494-3852  
[stephen.costa@dot.gov](mailto:stephen.costa@dot.gov)

## **Resources**

FHWA Alternative Fuel Corridor website:

[http://www.fhwa.dot.gov/environment/alternative\\_fuel\\_corridors/](http://www.fhwa.dot.gov/environment/alternative_fuel_corridors/)

MUTCD Memorandum – Signing for Designated Alternative Fuel Corridors:

[https://mutcd.fhwa.dot.gov/resources/policy/alt\\_fuel\\_corridors/index.htm](https://mutcd.fhwa.dot.gov/resources/policy/alt_fuel_corridors/index.htm)

DOE/NREL Alternative Fueling Station Locator:

<https://www.afdc.energy.gov/locator/stations/>