

# Breathing Easy

## A Survey of Zero Emission Buses Across America

Updated August 17<sup>th</sup>, 2018



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This document is based on information gathered on August 17<sup>th</sup>, 2018. This is the first edition of this document.

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## Executive Summary

Since the creation of the Clean Air Act, the federal government has been working with public and private organizations to reduce the amount of pollution released into the atmosphere. Urban transit buses have always been an issue for policymakers and environmental advocates because they have historically operated on diesel fuel. Although buses produce less smog per capita than cars, they still release toxic fumes like nitrous oxide directly into urban communities. The need for a public transportation option that produce little to no air pollutants has been a major goal for federal and state governments for years.

Between 2013 and 2018, the Federal Transit Administration (FTA) has distributed over \$271 million for hybrids, battery electric, and hydrogen fuel cell buses via the Low or No-emission Bus Program. State-level grant programs, such as California's Transit and Intercity Rail Capital Program (TIRCP), has also supported the adoption of zero emission buses (ZEBs). Over the last decade, the rise in ZEBs has increased dramatically across the country.

However, quantifying this increase has been difficult. Funding bodies like the FTA and TIRCP have track the number of buses they've supported, but do not assess how many ZEBs exist overall. Some state agencies, like the California Air Resource Board, have produced high quality maps of where ZEBs are, but only of their jurisdiction or of a particular technology rather than an across the board picture.

This report seeks to remedy this problem. Enclosed is breakdown of all zero emission buses, categorized by battery electric buses and hydrogen fuel cell buses, for every state in the US. A list of transit agencies who are actively operating, ordering, or has received funding for ZEBs is shown next. Lastly, a map of the country, as well as a close-up view of every state, is displayed with all of the aforementioned transit agency's logos.



## Important Notes About This Report

- 1) The data for this report has been gathered primarily through award documents, press releases, phone interviews, and other methods of validation. Every bus listed in this report has been checked several times, but it is possible that some mistakes have slipped through the cracks. If you believe an error has been made, please reach out to Elliott Popel ([epopel@calstart.org](mailto:epopel@calstart.org)) or Fred Silver ([fsilver@calstart.org](mailto:fsilver@calstart.org)).
- 2) Despite becoming much more popular among transit agencies, ZEBs are still a very advance piece of technology, and it can take months if not years for a bus manufacturer to build and deliver the vehicle. Determining what buses are operating today and what buses are on order is a function of time, and any attempt to do so would become immediately outdated. This report tracks all ZEBs known to be operating today, on order, or at least have been awarded funding for the transit agency to purchase. This report occasionally uses the acronym “**TIUOO**” to refer to the “Total In-Use or On-Order” number of ZEBs.
- 3) Shortly after the maps were created, the FTA announced the winners of \$84 million worth of LoNo Bus grants on August 24, 2018. This report will ignore those winners for now and instead focus on the ZEBs known to exist as of August 17, 2018 as described in the previous note. All future versions of this report will similarly be a specific snapshot of a single day, date marked in the title of the report.

## Result of Survey

As of August 17th, 2018, there are:

- 1,583 Battery Electric Buses (BEBs)
- 67 Hydrogen Fuel Cell Buses (FCBs)
- 1,650 Total Zero Emission Buses (ZEBs)



## State-By-State Zero Emission Bus Distribution

State		Battery Electric Buses	Fuel Cell Buses	Total Zero Emission Buses
Alaska	AK	1	0	1
Alabama	AL	1	1	2
Arkansas	AR	0	0	0
Arizona	AZ	0	0	0
California	CA	825	52	877
Colorado	CO	44	0	44
Connecticut	CT	6	0	6
District of Columbia	DC	14	0	14
Delaware	DE	16	0	16
Florida	FL	70	0	70
Georgia	GA	21	0	21
Hawaii	HI	5	0	5
Iowa	IA	3	0	3
Idaho	ID	2	0	2
Illinois	IL	59	2	61
Indiana	IN	66	0	66
Kansas	KS	0	0	0
Kentucky	KY	21	0	21
Louisiana	LA	9	0	9
Massachusetts	MA	15	1	16
Maryland	MD	16	0	16
Maine	ME	0	0	0
Michigan	MI	0	1	1
Minnesota	MN	12	0	12
Missouri	MO	11	0	11
Mississippi	MS	0	0	0
Montana	MT	4	0	4
North Carolina	NC	13	0	13
North Dakota	ND	0	0	0
Nebraska	NE	2	0	2
New Hampshire	NH	0	0	0
New Jersey	NJ	7	0	7
New Mexico	NM	18	0	18
Nevada	NV	5	0	5
New York	NY	29	0	29
Ohio	OH	3	10	13

State		Battery Electric Buses	Fuel Cell Buses	Total Zero Emission Buses
Oklahoma	OK	2	0	2
Oregon	OR	12	0	12
Pennsylvania	PA	27	0	27
Rhode Island	RI	0	0	0
South Carolina	SC	22	0	22
South Dakota	SD	0	0	0
Tennessee	TN	19	0	19
Texas	TX	24	0	24
Utah	UT	19	0	19
Virginia	VA	1	0	1
Vermont	VT	2	0	2
Washington	WA	154	0	154
Wisconsin	WI	3	0	3
West Virginia	WV	0	0	0
Wyoming	WY	0	0	0

## Transit Properties with Battery Electric or Fuel Cell Transit Buses

No.	Transit Property	State
1	Alaska Department of Transportation & Public Facilities	AK
2	Alabama A&M University	AL
3	BJCTA MAX	AL
4	Alameda-Contra Costa Transit District (ZEBA)	CA
5	Anaheim Resort Transportation	CA
6	Anteater Express (University of California, Irvine)	CA
7	AVTA	CA
8	Bruin Bus (University of California, Los Angeles)	CA
9	California State University Fresno	CA
10	Central Contra Costa Transit Authority (CCTA / County Connection)	CA
11	Fairfield and Suisun Transit (FAST)	CA
12	Foothill Transit	CA
13	Fresno Area Express (FAX)	CA
14	Fresno County Rural Transit	CA
15	Golden Empire Transit District (GETbus)	CA
16	GTrans	CA
17	Humboldt Transit Authority	CA
18	LA Metro	CA
19	LADOT	CA
20	Long Beach Transit	CA
21	Marguerite (Stanford University)	CA
22	Marin Transit	CA
23	Modesto Transit	CA
24	Montebello	CA
25	Monterey-Salinas Transit	CA
26	Napa Valley Transportation Authority	CA
27	North County Transit District	CA
28	Norwalk Transit System	CA
29	Orange County Transportation Authority	CA
30	Porterville Transit	CA
31	Redding Area Bus Authority	CA
32	Sacramento Airport	CA
33	Sacramento Regional Transit District	CA
34	San Diego Metropolitan Transit System	CA
35	San Francisco Municipal Transportation Agency	CA
36	San Joaquin Regional Transit District	CA



No.	Transit Property	State
37	San Jose Airport	CA
38	San Mateo County Transit District	CA
39	Santa Barbara Metropolitan Transit District	CA
40	Santa Clara Valley Transportation Authority	CA
41	Santa Cruz Metropolitan Transit Districts	CA
42	Santa Monica Big Blue Bus	CA
43	Santa Rosa City Bus	CA
44	Solano County Transit	CA
45	Sonoma County Transit	CA
46	SunLine Transit	CA
47	Tri Delta Transit (Antioch Transit/Eastern Contra Costa Transit Authority)	CA
48	Visalia Transit	CA
49	We Drive U, Inc.	CA
50	Denver RTD	CO
51	State of Colorado Department of Transportation	CO
52	Connecticut Department of Transportation	CT
53	DC Circulator	DC
54	Delaware Transit Corporation	DE
55	Broward County	FL
56	City of Tallahassee	FL
57	Gainesville RTS	FL
58	Jacksonville Transportation Authority	FL
59	LYNX	FL
60	Miami-Dade County	FL
61	Pinellas Suncoast Transit Authority	FL
62	Georgia Department of Transportation	GA
63	University of Georgia	GA
64	City and County of Honolulu	HI
65	Des Moines Area Regional Transit Authority (DART)	IA
66	Mountain Rides Transportation Authority	ID
67	601 W Companies, LLC	IL
68	Bloomington-Normal Public Transit System	IL
69	Champaign-Urbana Mass Transit	IL
70	Chicago Transit Authority	IL
71	JLL	IL
72	Quad Cities Metrolink	IL
73	SL PRU, LLC	IL
74	Indianapolis Airport	IN
75	IndyGo	IN

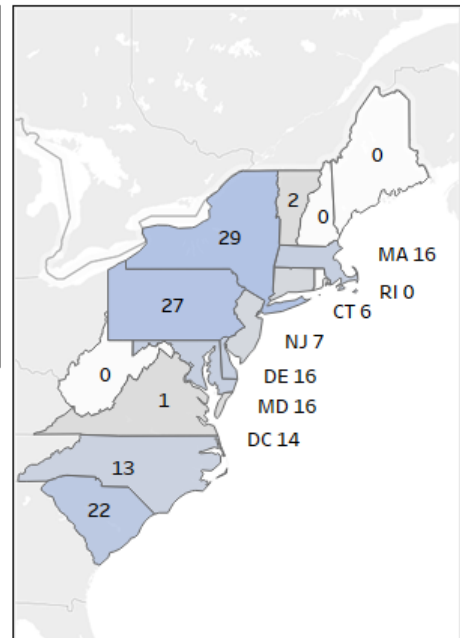
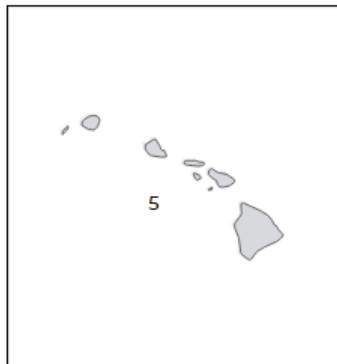
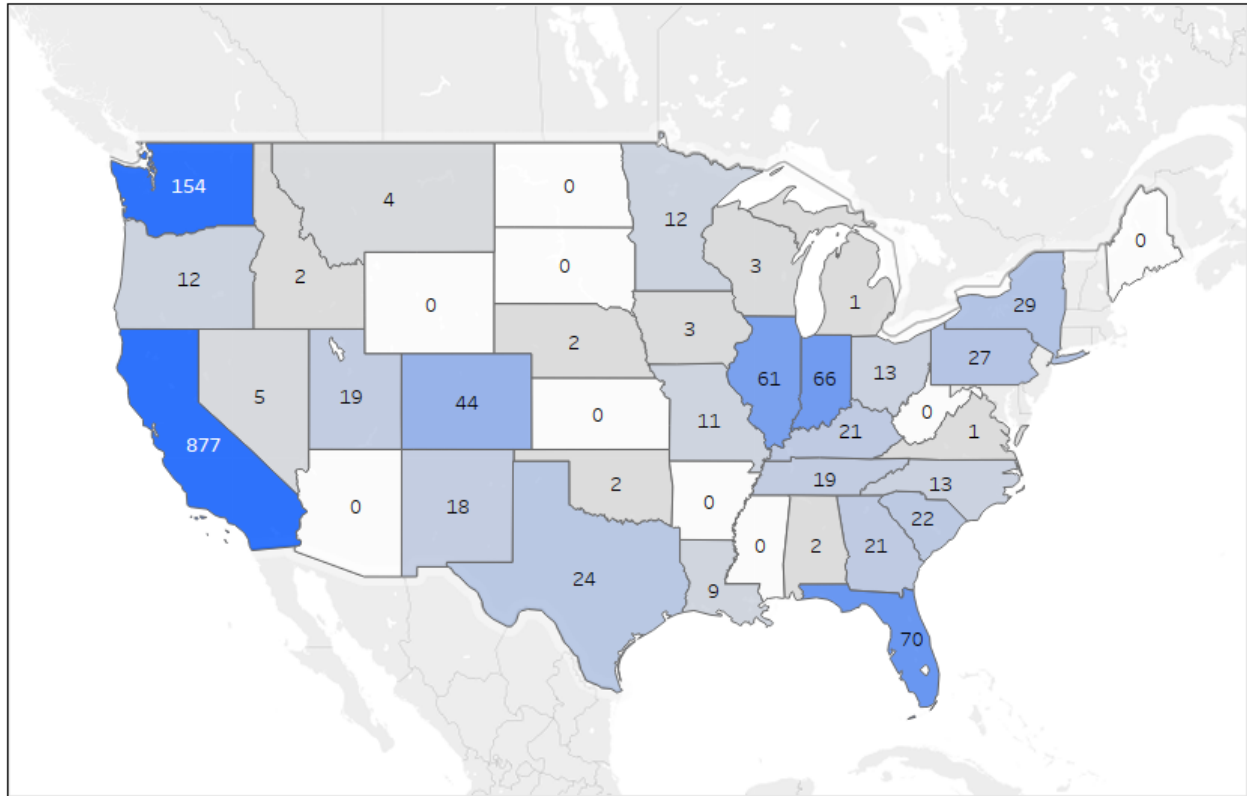
No.	Transit Property	State
76	Lextrans	KY
77	TARC	KY
78	Capital Area Transit Systems (CATS)	LA
79	City of Shreveport	LA
80	Lafayette City-Parish Consolidated Government	LA
81	Martha's Vineyard Transit Authority	MA
82	Massachusetts Bay Transportation Authority	MA
83	Pioneer Valley Transit Authority	MA
84	Worcester Regional Transit Authority	MA
85	Maryland Department of Transportation	MD
86	Montgomery County, Maryland	MD
87	Regional Transportation Agency	MD
88	TransIT (Frederick County)	MD
89	Flint Mass Transportation Authority	MI
90	Duluth Transit Authority	MN
91	Metro Transit	MN
92	City of Columbia	MO
93	St Louis Metro Transit	MO
94	Missoula Urban Transportation District	MT
95	University of Montana	MT
96	City of Asheville	NC
97	Greensboro	NC
98	Raleigh-Durham International Airport	NC
99	City of Lincoln	NE
100	Academy Express LLC	NJ
101	New Jersey Transit	NJ
102	Albuquerque Rapid Transit	NM
103	City of Las Cruces	NM
104	Regional Transportation of Washoe County	NV
105	Tahoe Transportation District	NV
106	Capital District Transportation Authority	NY
107	Columbia University	NY
108	NYCTA	NY
109	Port Authority of NY and NJ	NY
110	Rochester Genesee Regional Transportation Authority	NY
111	SARTA	OH
112	Central Oklahoma Transportation and Parking Authority	OK
113	City of Wilsonville, Oregon	OR
114	Lane Transit District	OR

<b>No.</b>	<b>Transit Property</b>	<b>State</b>
115	TriMet	OR
116	Port Authority of Allegheny County (PAAC)	PA
117	Southeastern Pennsylvania Transportation Authority	PA
118	City of Seneca and Oconee County	SC
119	Clemson Area Transit	SC
120	Greenville Transit Authority	SC
121	Chattanooga Area Regional Transportation Authority	TN
122	Nashville Metropolitan Transit Authority (Nashville MTA)	TN
123	City of Lubbock/Citibus	TX
124	City of McAllen	TX
125	Dallas Area Rapid Transit Authority	TX
126	Port Arthur Transit	TX
127	VIA Metropolitan Transit	TX
128	Park City Transit	UT
129	Utah Transit Authority	UT
130	Hampton Roads Transit	VA
131	Vermont Agency of Transportation	VT
132	BFT	WA
133	Chelan Douglas Public Transportation Benefit Area	WA
134	Everett Transit	WA
135	King County Metro	WA
136	Kitsap Transit	WA
137	Pierce Transit	WA
138	Valley Transit	WA
139	City of Madison	WI

# Zero Emission Bus Map

## Battery and Fuel Cell Electric Transit Buses Currently Deployed, On Order, or Soon To Be On Order Within the United States of America

Last Updated: August 17, 2018



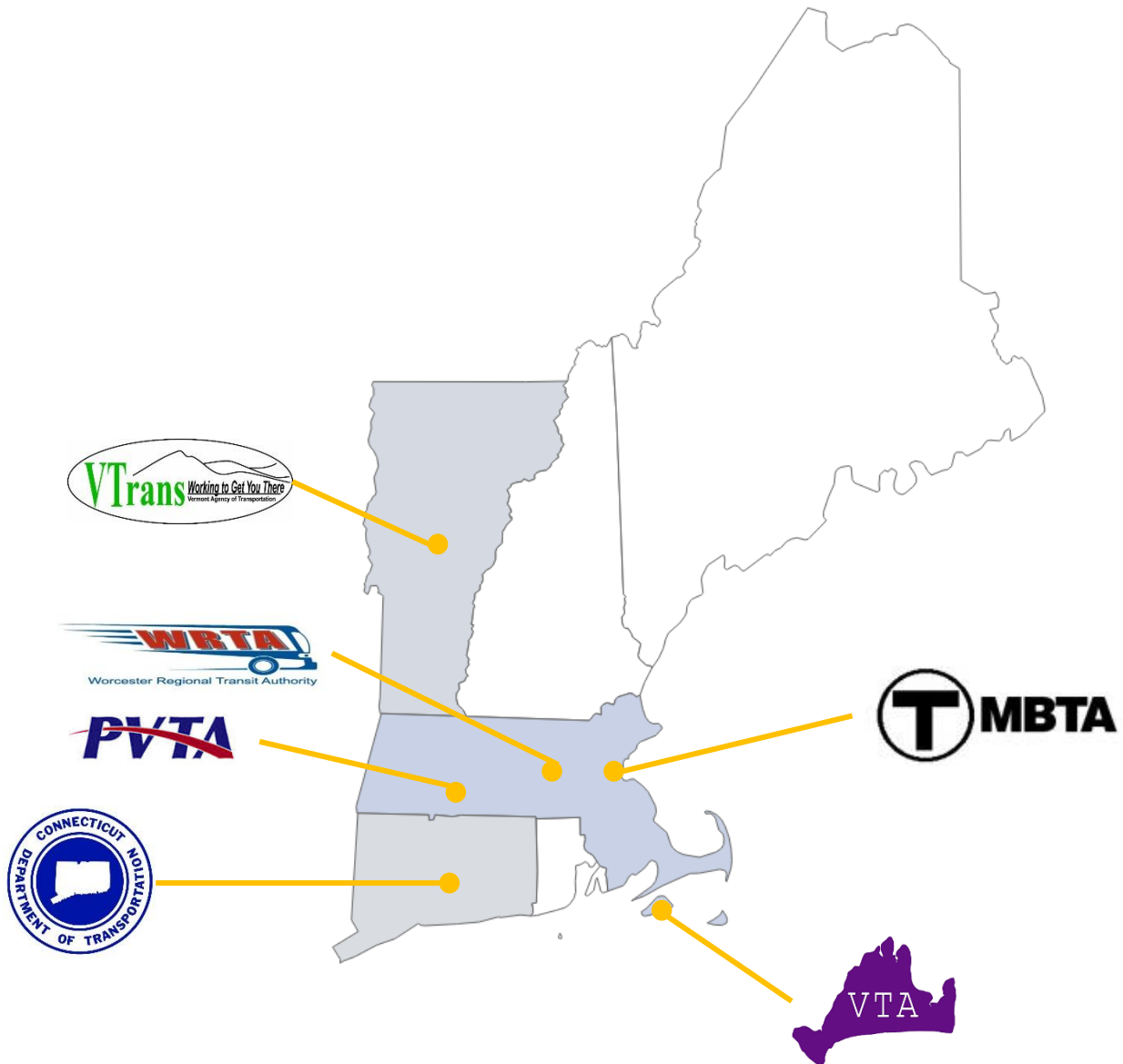
Total ZEBs per State  
0 100+

Source: Popel, E. (2018, August 17). Battery and Fuel Cell Electric Transit Buses Currently Deployed, On Order, or Soon To Be On Order Within the United States of America CALSTART, Inc.

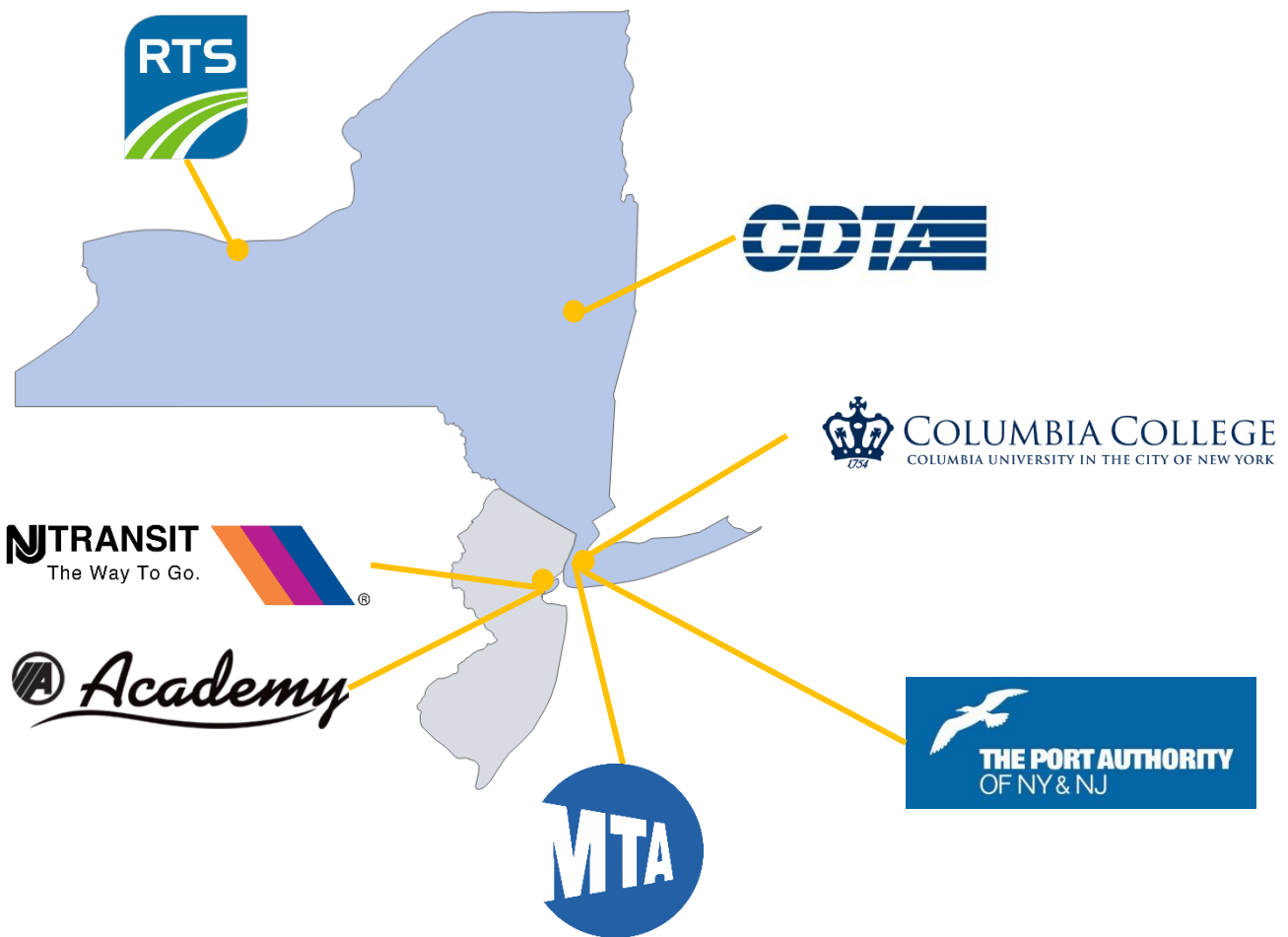


# Transit Properties Logo Map, By FTA Regions

## FTA Region 1

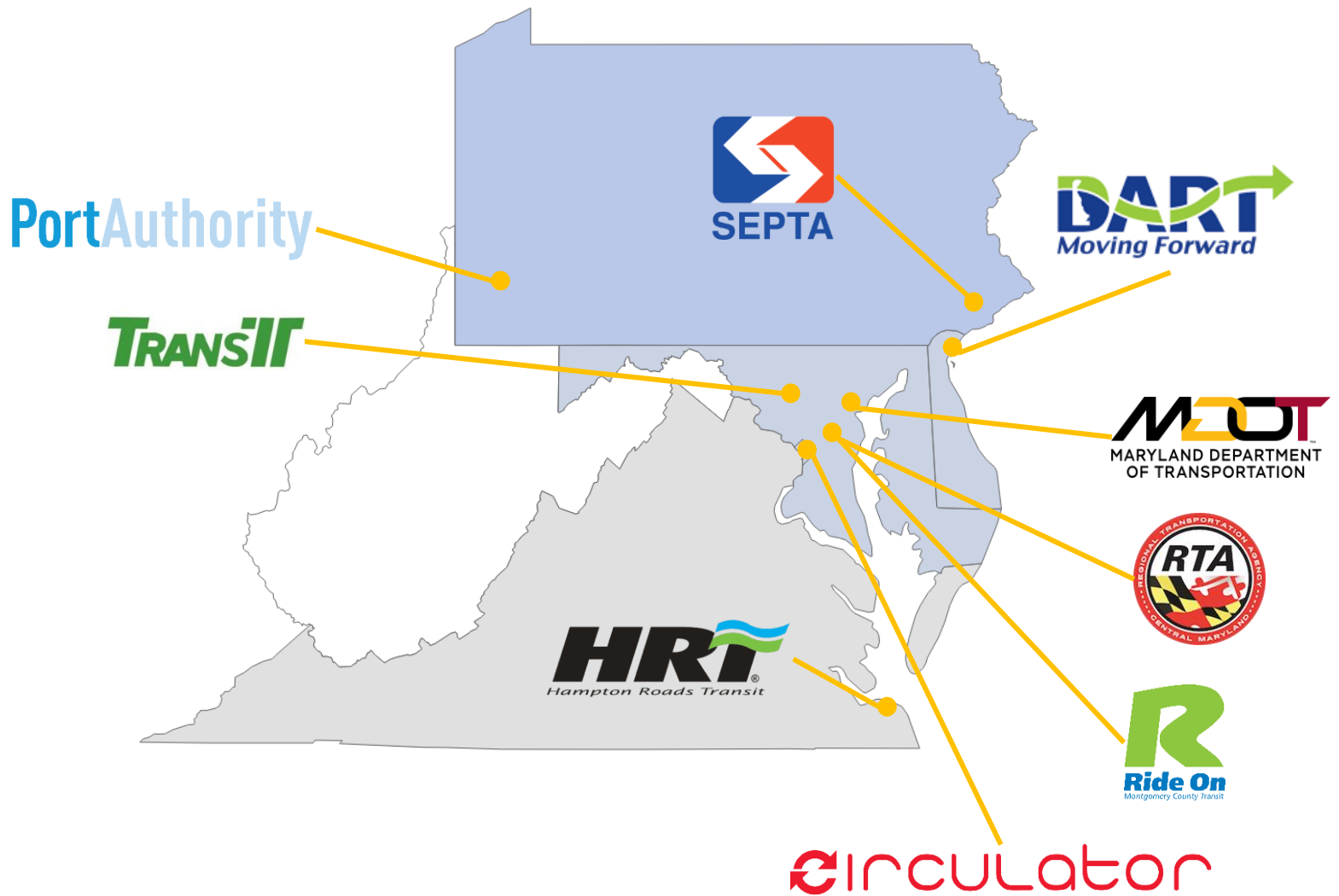


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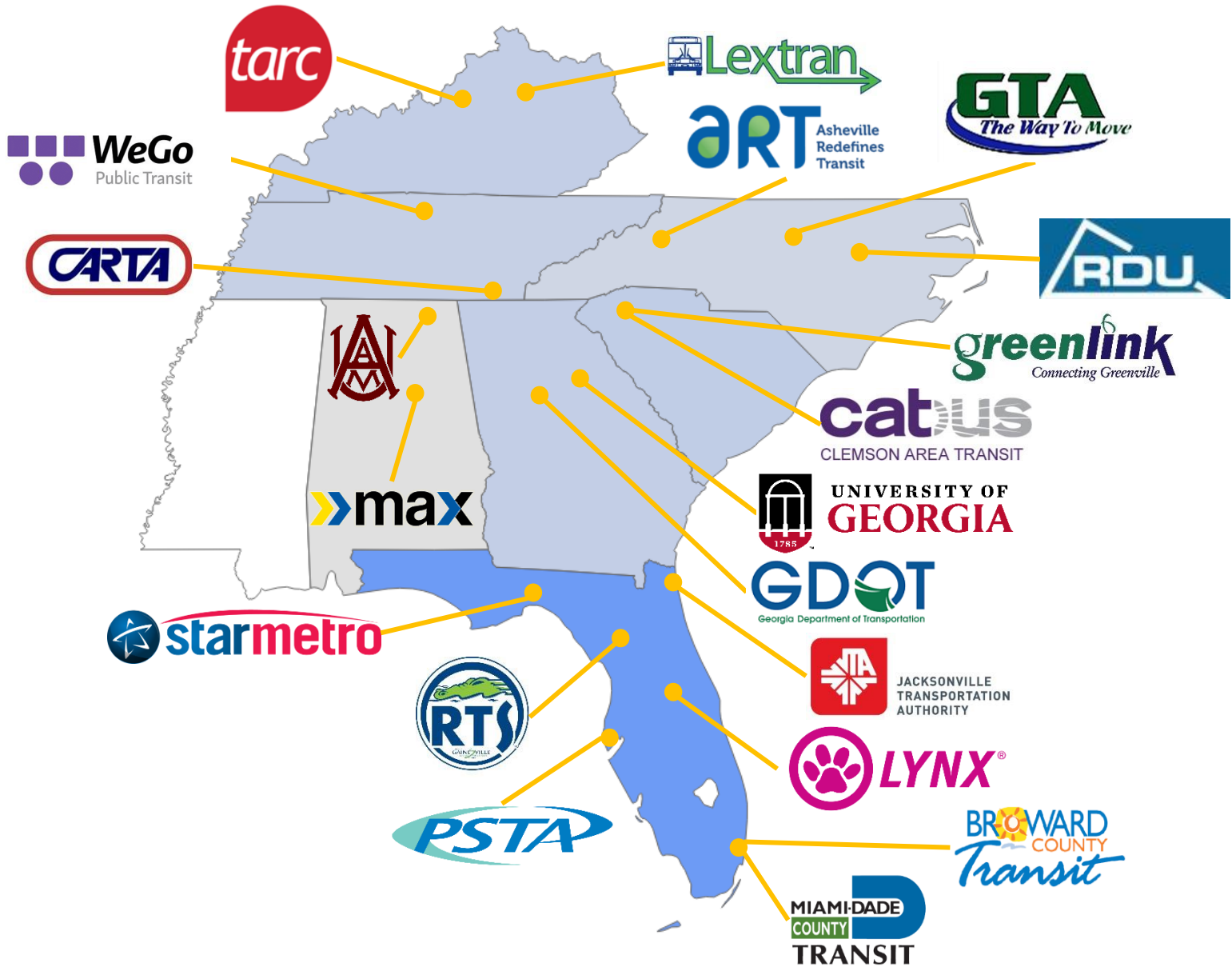




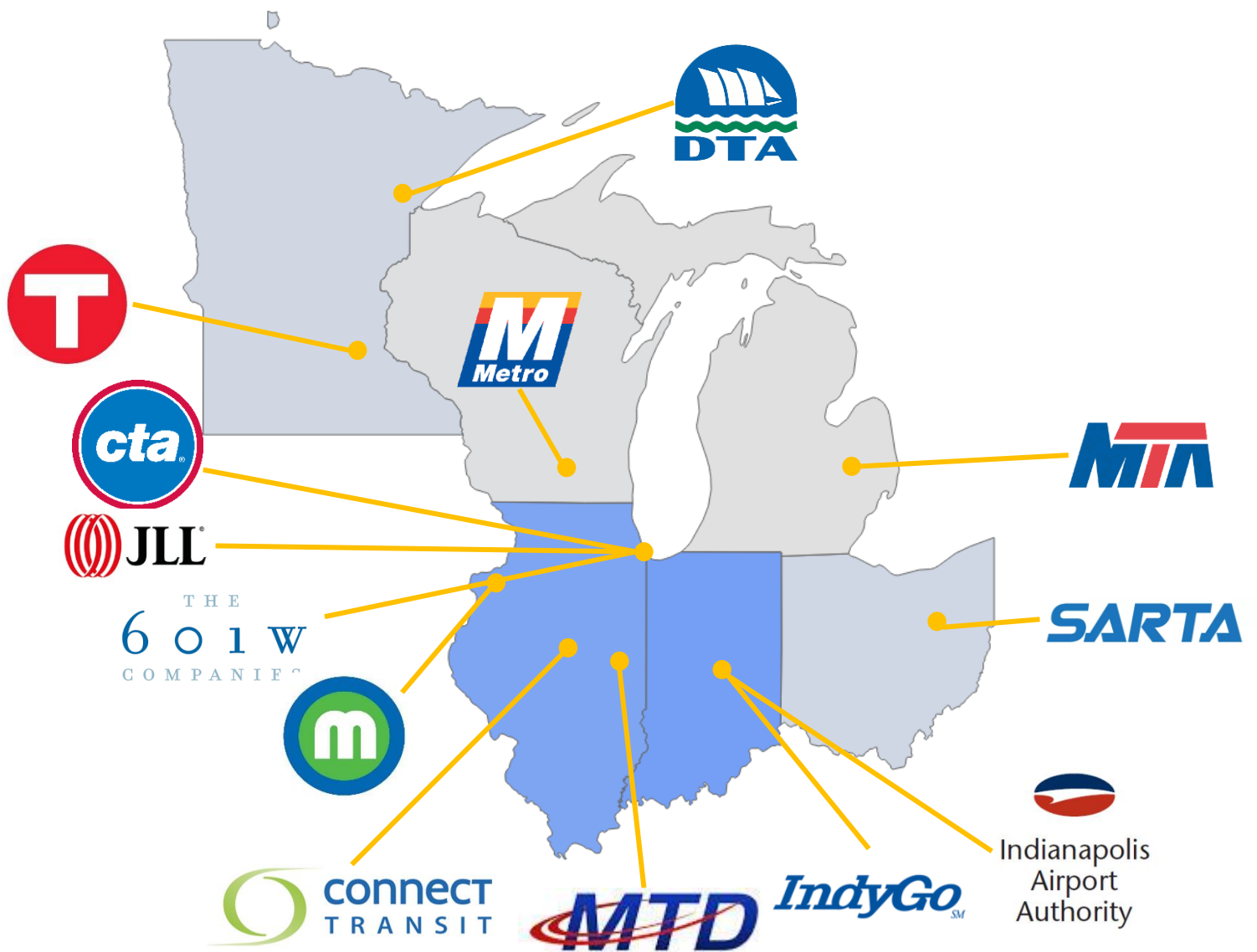
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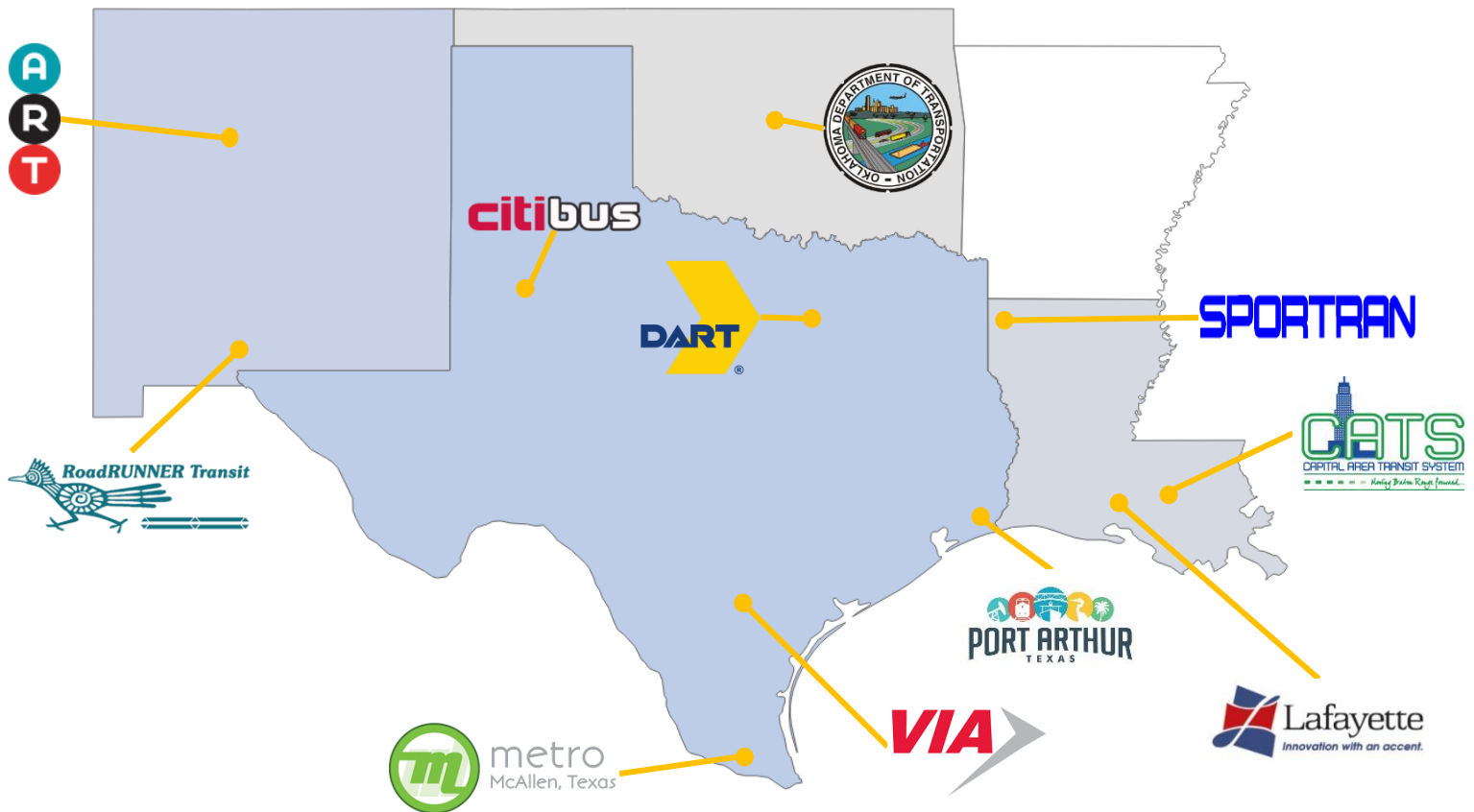
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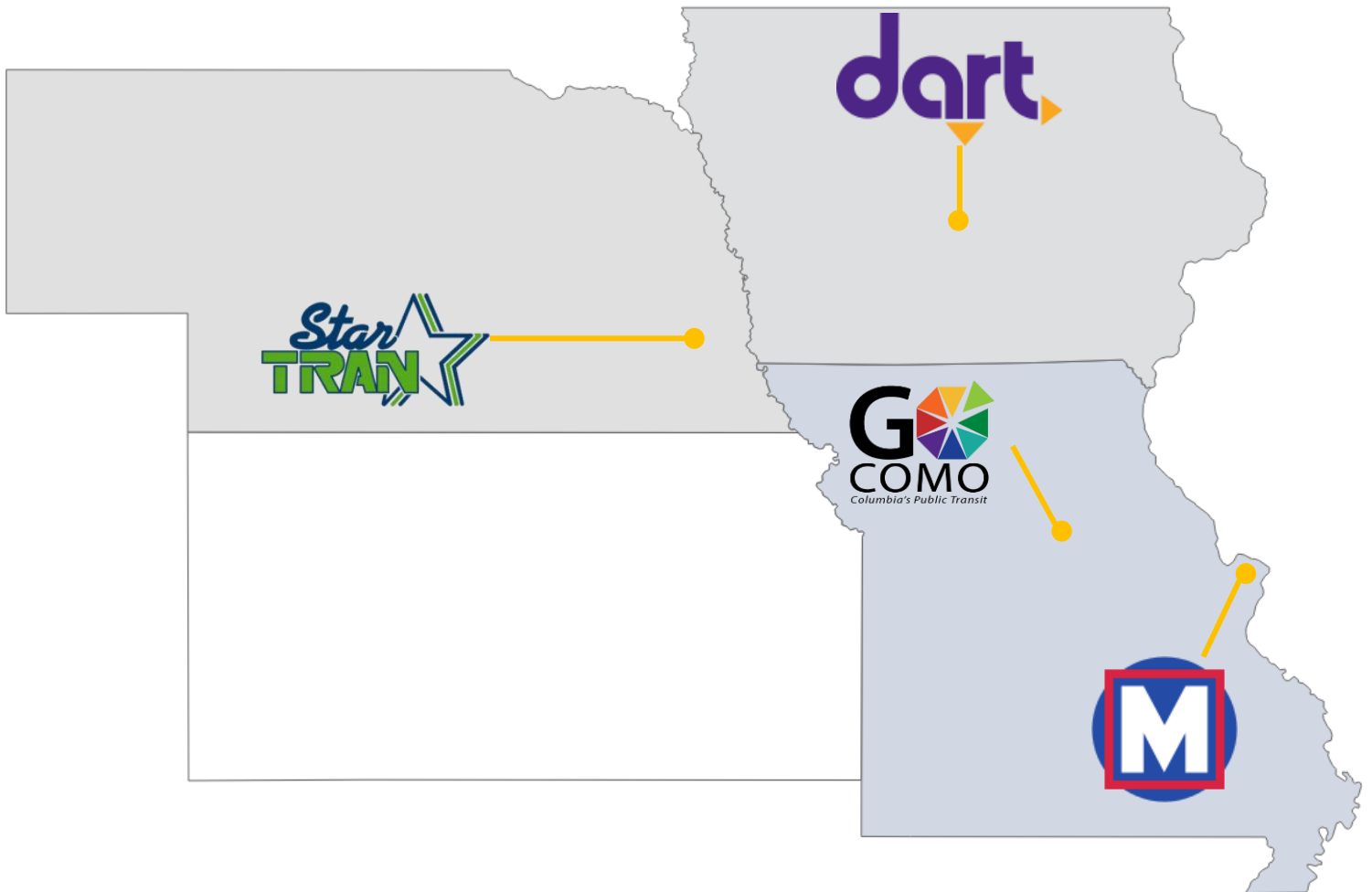
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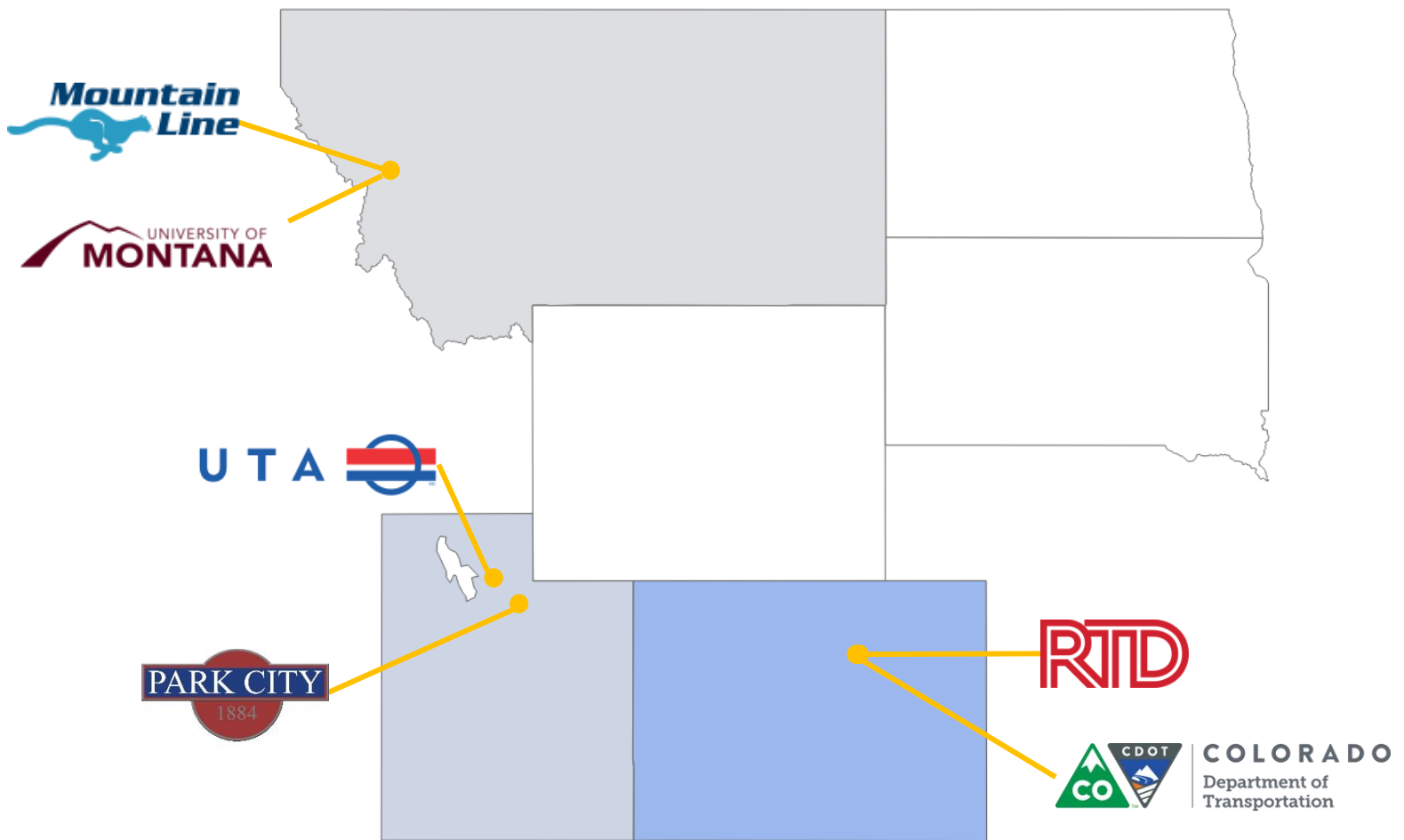
## FTA Region 6



## FTA Region 7

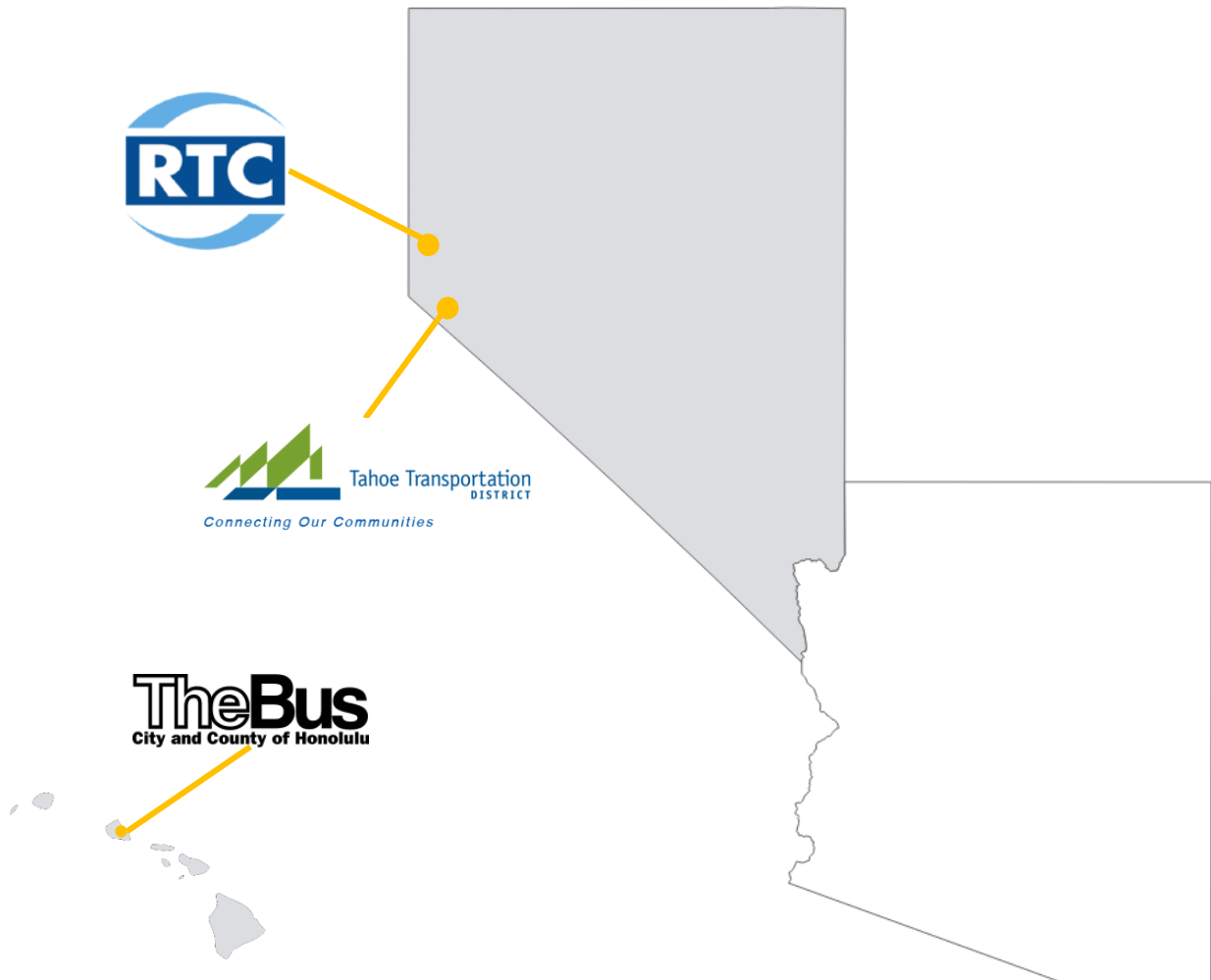


## FTA Region 8

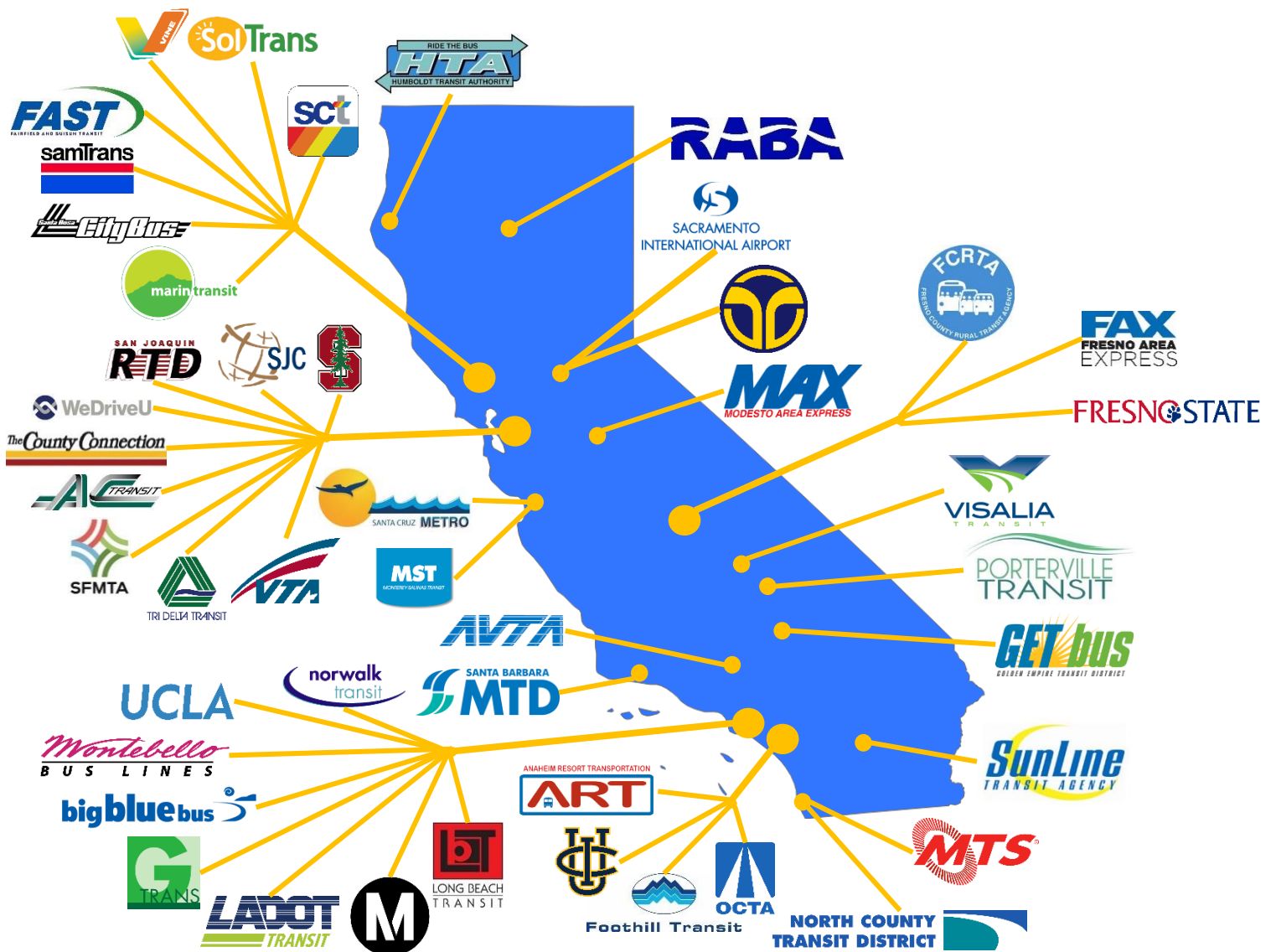




## FTA Region 9 (Without California)



# California



## FTA Region 10

