

FAIR Project

By Jennifer van Langen & Lucca Ferri de Souza



Introduction

- State of Washington's Electric Vehicle Population Data
 - USA government data
- 17 columns, each row is a Vehicle
- Limited metadata
 - Landing page has more information

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	2020 Census Tract	
VIN (1-10)	County	City	State	Postal Code	Model Year	Make	Model	Electric Vehicle Type	Clean Alternative Fuel Vehicle (CAFV) Eligible	Electric Range	Base MSRP	Legislative District	DOL Vehicle ID	Vehicle Location	Electric Utility			
2	9YJ3E1EB5K	Yakima	WA	98901	2019	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	220	0	15	347724772	POINT (-120.50729 46.60464)	PACIFICORP		53077001562	
3	1CA4R1XU67R	Kitsap	Port Orchard	WA	98367	2019	WRANGLER	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range	21	0	35	272165286	POINT (-122.68471 47.30524)	PUGET SOUND ENERGY INC		530305092901	
4	KNDCD9LDDN	Snohomish	Lynnwood	WA	98036	2022	KIA	NIRO	Plug-In Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range	26	0	32	203182584	POINT (-122.29245 47.82575)	PUGET SOUND ENERGY INC		53061051420
5	SUXKTC037H	King	Auburn	WA	98001	2017	BMW	X5	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range	14	0	30	349010287	POINT (-122.23035 47.3074)	PUGET SOUND ENERGY INC CITY OF TACOMA		53033028606
6	1NA4Z0C2P1D	Skagit	Mount Vernon	WA	98273	2018	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	75	0	40	131684150	POINT (-122.33891 48.16444)	PUGET SOUND ENERGY INC		53057952304
7	1NB4Z0C0P6G	Snohomish	Marysville	WA	98270	2018	Nissan	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	84	0	44	256278109	POINT (-122.1769 48.06114)	PUGET SOUND ENERGY INC		53061052710
8	5YSA1E26G	Chelan	Manson	WA	98831	2018	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	210	0	12	338404888	POINT (-120.16034 47.8854)	PUD NO 1 OF CHELAN COUNTY		53007960400
9	7SAYGD0E7	Snohomish	Bothell	WA	98021	2023	TESLA	MODEL Y	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range has not been researched	0	0	1	241606060	POINT (-122.18384 47.8031)	PUGET SOUND ENERGY INC		53061051917
10	1NA4Z0C0P5F	Snohomish	Edmonds	WA	98020	2015	Nissan	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	84	0	32	173391158	POINT (-122.3769 47.81116)	PUGET SOUND ENERGY INC		53061050502
11	WP1A1E2A5G	Snohomish	Everett	WA	98208	2016	POSCHE	CAYENNE	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range	14	0	44	176239570	POINT (-122.18637 47.89251)	PUGET SOUND ENERGY INC		53061041704
12	5YSA1E145K	Kitsap	Port Orchard	WA	98366	2019	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	270	0	26	272614065	POINT (-122.63847 47.54103)	PUGET SOUND ENERGY INC		53035092300
13	SUXTA6C09M	Snohomish	Monroe	WA	98272	2021	BMW	XS	Plug-in Hybrid Electric Vehicle (PHEV)	Clean Alternative Fuel Vehicle Eligible	30	0	39	138597924	POINT (-121.58087 47.8526)	PUGET SOUND ENERGY INC		53061052203
14	1G1FX6S06H	Snohomish	Everett	WA	98208	2017	CHEVROLET	BOLT EV	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	238	0	44	321043404	POINT (-122.18637 47.89251)	PUGET SOUND ENERGY INC		53061052118
15	5YJ3E1B80K	Yakima	Yakima	WA	98901	2019	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	220	0	15	240774927	POINT (-120.50729 46.60464)	PACIFICORP		53077001602
16	LPSED3K3AM	Snohomish	Bothell	WA	98012	2021	POLESTAR	PS2	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	233	0	44	17797680	POINT (-122.10614 47.83448)	PUGET SOUND ENERGY INC		53061052007
17	KNDC3L1GL	Snohomish	Edmonds	WA	98025	2020	KIA	NIRO	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	239	0	21	115041930	POINT (-122.31768 47.87166)	PUGET SOUND ENERGY INC		53061042003
18	1NA4Z1CP1J	Spokane	Spokane	WA	99223	2018	Nissan	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	151	0	6	326278200	POINT (-117.36043 47.83396)	MODERN ELECTRIC WATER COMPANY		53063004702
19	1NA4Z0C0P7D	Snohomish	Snohomish	WA	98290	2013	Nissan	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	75	0	44	185323862	POINT (-122.09305 47.91265)	PUGET SOUND ENERGY INC		53061052502
20	JN1BF0BAG6	Snohomish	Everett	WA	98204	2023	Nissan	ARIYA	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range has not been researched	0	0	21	261308225	POINT (-122.75575 47.88936)	PUGET SOUND ENERGY INC		53061041806
21	IHMZC5F35J	Snohomish	Everett	WA	98203	2018	HONDA	CLARITY	Plug-in Hybrid Electric Vehicle (PHEV)	Clean Alternative Fuel Vehicle Eligible	47	0	38	180431870	POINT (-122.23019 47.94949)	PUGET SOUND ENERGY INC		53061041206
22	KNDCSS1R	Skagit	Anacortes	WA	98221	2024	KIA	NIRO	Plug-in Hybrid Electric Vehicle (PHEV)	Clean Alternative Fuel Vehicle Eligible	33	0	10	25938008	POINT (-122.81214 48.51748)	PUGET SOUND ENERGY INC		53057940302
23	7SAYGDE4P	Snohomish	Bothell	WA	98012	2023	TESLA	MODEL Y	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range has not been researched	0	0	1	261279630	POINT (-122.210614 47.83448)	PUGET SOUND ENERGY INC		53061051933
24	5YJ3E1ETXR	Yakima	Yakima	WA	98901	2024	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range has not been researched	0	0	15	268212612	POINT (-120.50729 46.60464)	PACIFICORP		53077001702
25	5YJ3E1B8K	Kitsap	Bremerton	WA	98337	2019	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	220	0	26	251048017	POINT (-122.38347 47.9365)	PUGET SOUND ENERGY INC		53035080500
26	5YJ3E1B8X	Fairfax	Burke	VA	22015	2018	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	220	0	312505950	POINT (-77.27191 38.79539)	NON WASHINGTON STATE ELECTRIC UTILITY		51059432000	
27	5YJ3E1A0NS	Thurston	Olympia	WA	98513	2025	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range has not been researched	0	0	2	275181903	POINT (-122.37154 46.98876)	PUGET SOUND ENERGY INC		53067012331
28	5YJ3E1B8L	Yakima	Yakima	WA	98901	2028	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	322	0	15	237967131	POINT (-120.50729 46.60464)	PACIFICORP		53077001602
29	5YJ3E1B85L	Snohomish	Bothell	WA	98021	2020	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	322	0	1	4741971	POINT (-122.38347 47.8031)	PUGET SOUND ENERGY INC		53061051917
30	5YJ3E1B86J	Snohomish	Everett	WA	98208	2018	TESLA	MODEL3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	215	0	44	20346961	POINT (-122.18637 47.89251)	PUGET SOUND ENERGY INC		53061041607
31	WB77ZC52J	Thurston	Olympia	WA	98502	2018	BMW	i3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	114	0	22	18088561	POINT (-122.92333 47.03779)	PUGET SOUND ENERGY INC		53067010520
32	1NA4Z0C0P5D	Chelan	Cashmere	WA	98615	2013	Nissan	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	75	0	12	201803941	POINT (-120.47005 47.5224)	PUD NO 1 OF CHELAN COUNTY		53007960600



FAIRification planning

- Goals:
 - Add rich metadata and URIs
 - Map data to existing ontologies
 - Make dataset more readable
- Stakeholders
 - Government agencies
 - Researchers
- Existing FAIR-support:
 - Identifiers
 - License

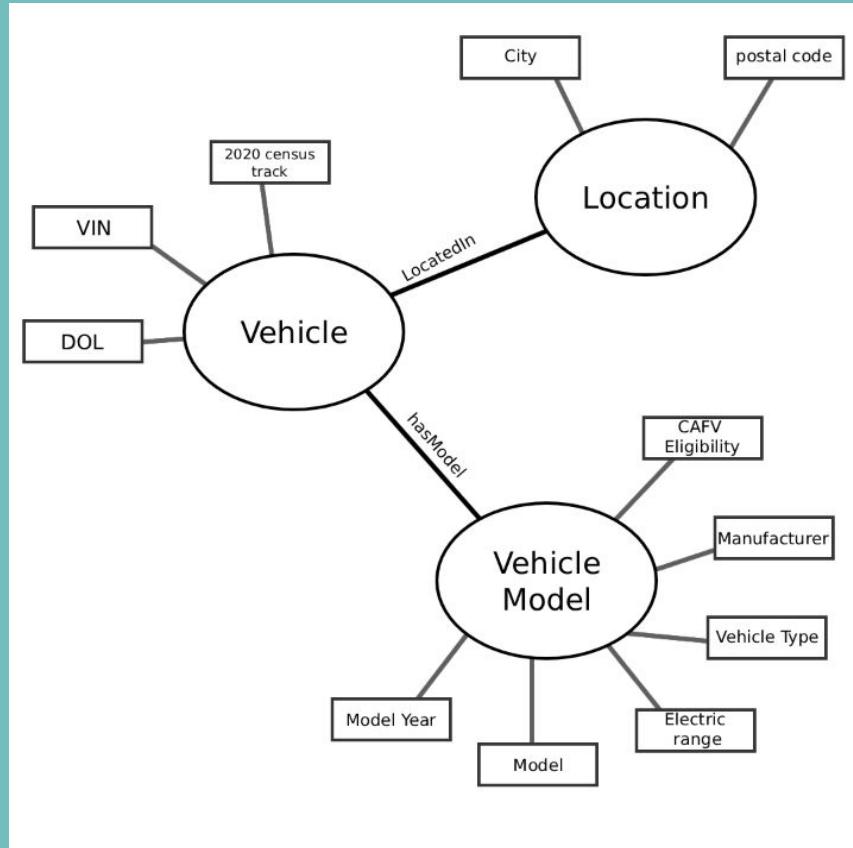


Data Preparation

- **Removed:** Base MSRP, Legislative District, Vehicle Location and Electric Utility
- **Merged:** City, County and State into City due to Findability
- **Reconciled:** City, Make, Model and Electric Vehicle Type
- Unique global identifier

Semantic data model

- Three entities
- Relationships
- Attributes





Metadata schema

Findable and reusable:

- Title
- Description
- Creator
- License
- Language
- Keywords



FAIRness improvements

- Findability:
 - Proper identifiers
 - URLs making data linkable
 - Adding rich metadata
- Accessibility:
 - Using a standardised protocol for RDF
- Interoperability:
 - Reconciliation
 - Using standardised vocabularies
- Reusability:
 - Describing the (meta)data extensively