Infrastructure Overview

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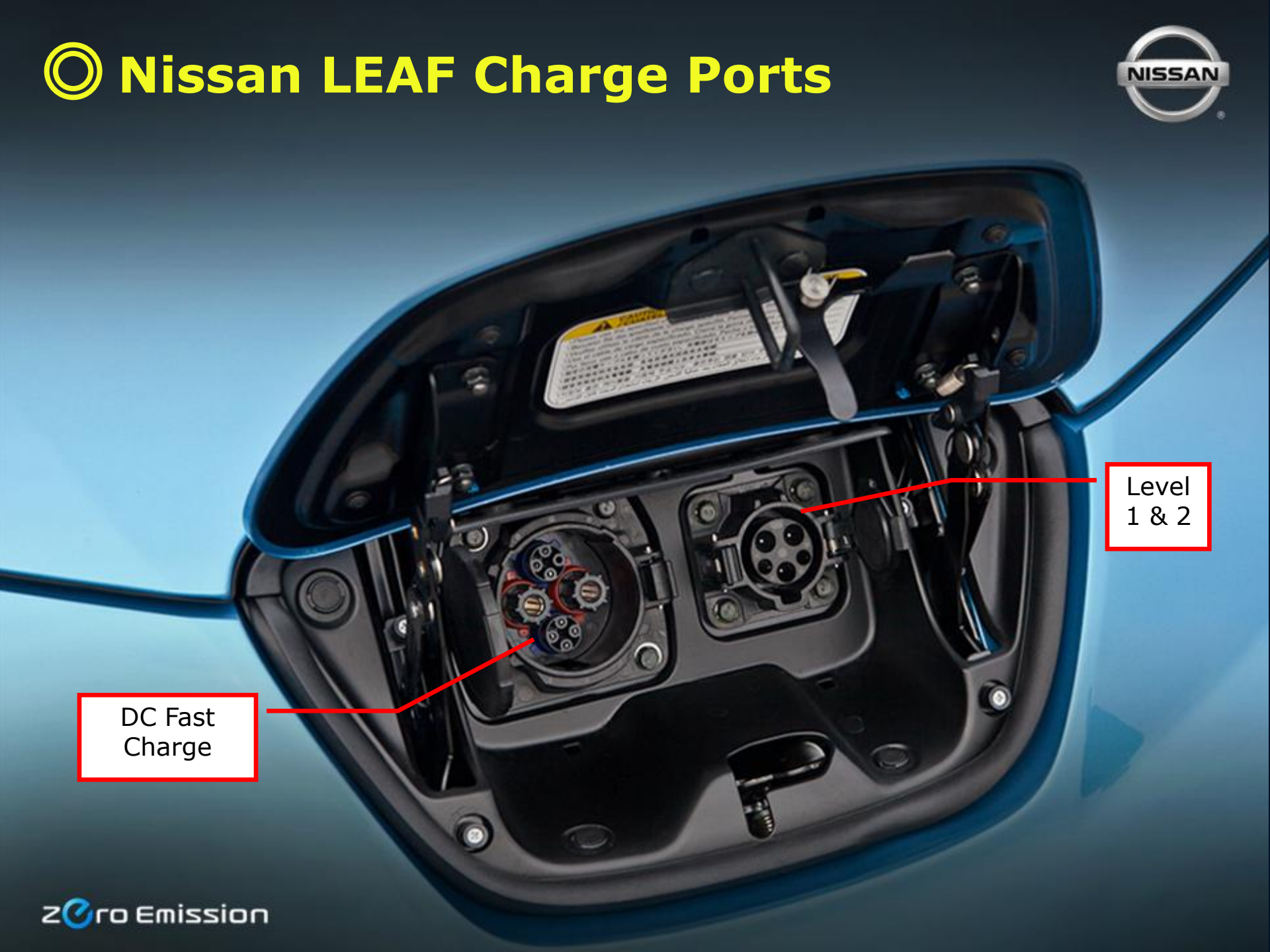
Nissan LEAF Charge Ports



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Charging Levels

Type	Power Supply		Charger Power	Charging Level	Charger Location	Charging Time (24kwh Battery)
Normal	120VAC Single Phase	12A	1.4kW	Level 1	On-board	18h
	240VAC Single Phase	15A	3.3kW	Level 2		8h
		30A	6.6kW			4h
Fast	480VDC 3-phase		50kW	Level 3	Off-board	30min

Charging time and mileage

Charging Level	Mileage and Charging time			
	2hr	4hr	6hr	8hr
Level 2 (240 volts, 16amps)	+25mile	+50mile	+75mile	+100mile
Level 1 (120 volts, 12amps)	+10mile	+20mile	+30mile	+40mile

- DC Quick charging: 80% in about 30 min

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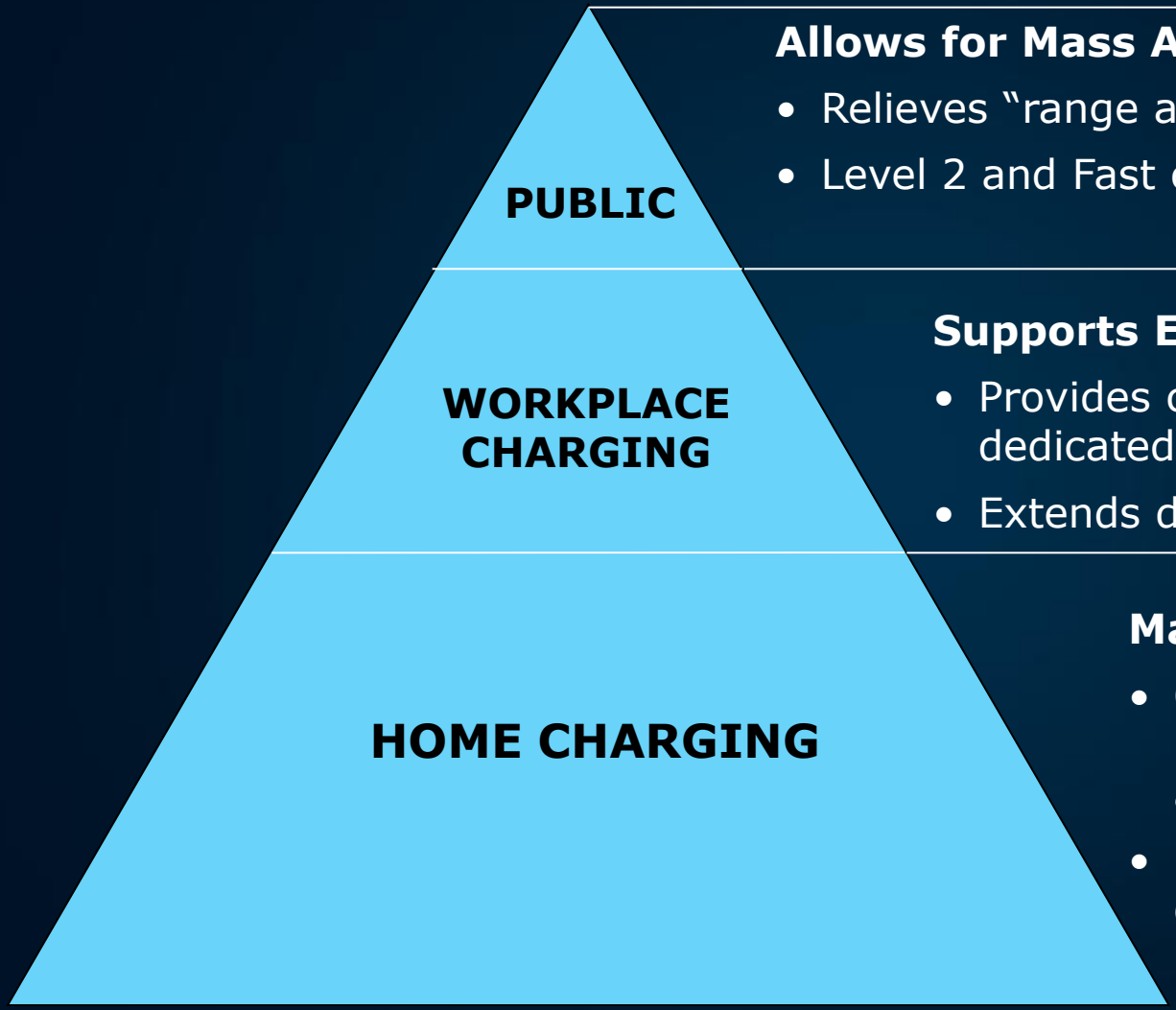
Charging Pyramid



Allows for Mass Adoption

- Relieves "range anxiety"
- Level 2 and Fast charging capability

Supports EV Ownership

- Provides charging for those without dedicated home charging
- Extends daily travel range

Majority of Charging

- Owners with single family homes will charge overnight at off-peak rates
- Business fleets charge overnight at their "home" location

Level 1 trickle charge

- A level 1 cordset is included with each vehicle (located in the trunk)
- 1.4kw, 12.5 amps

Level 2 Residential

- Goal
  - Simple, one-stop shop for the consumer have charging equipment installed at home
- AeroVironment selected as Nissan's preferred vendor for residential charging equipment
  - Includes all US markets
- AeroVironment provides
  - The charging dock
  - Manages permitting + installations
  - Trains contractor network

AeroVironment Equipment

SAFETY DESIGN

- Automatic short circuit shut off
- Automatic ground fault shut-off
- Protection against live power in event of cable breakaway
- UL listed
- Outdoor rated to withstand weather conditions
- Surge protection
- 15’ or 25’ cord, no-cost option

DEPENDABILITY

- Technology based on more than 20 years of EV charging
- Americans with Disabilities Act (ADA) compliant
- Standard 3-year warranty

SERVICE

- Nationwide network of certified electrician installers
- Rapid response time for warranty service and support

Nissan's Role in The EV Project

- Allocating 5,700 Nissan LEAF vehicles to project participants in 5 states
- Integrating the Nissan LEAF retail sales process with Ecotality to ensure a seamless customer experience
- Providing data from the LEAF telematics system to support the Ecotality / Dept. of Energy infrastructure usage study
- Installing a DC Fast Charge Port on each project vehicle
- Providing Nissan LEAF handraiser and reservation data to assist with the infrastructure planning phase of the project

Level 2 Public Charging

Strong competition in the market

- AeroVironment
- ECOtality
- Coulomb
- Clipper Creek
- SemaConnect
- Go Smart
- Leviton
- Shore Power
- Better Place
- General Electric
- Schneider Electric
- EV Charge America
- Juice Bar
- Eaton

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Sample of Large Infrastructure Projects

Program	Total Amount	Markets	Level 2 Public	DC Fast
EV Project (Ecotality) [DOE]	$230.0M	AZ, CA, OR, TN, TX, WA	5,600	340
ChargePoint America (Coulomb) [DOE]	$37.0M	CA, DC, FL, TX, MI, NY, WA	2,600	0
Bay Area AQMD	$5M	CA	0	30
California AB 118 [CEC]	$3.6M	CA	635	0
Hawaii (State Grant)	$3.0M	HI	450	0
City of Chicago	$1.9M	IL	207	73
Total	+ $280 M	26 States	12K+	600+

Public (Planned) Infrastructure

More than 13,000 EV Charge Stations on the way by the end of 2012…

◎ Telematics and Station Mapping

LEAF is equipped with Telematics control unit that transmits and receives data that will allow for unprecedented conveniences.

Remote vehicle access

- Charging/Climate Control
- Charge Status
- Plug-in reminder
- Access by internet and web-enabled phone

Automatic charging spot

NEW charging spots

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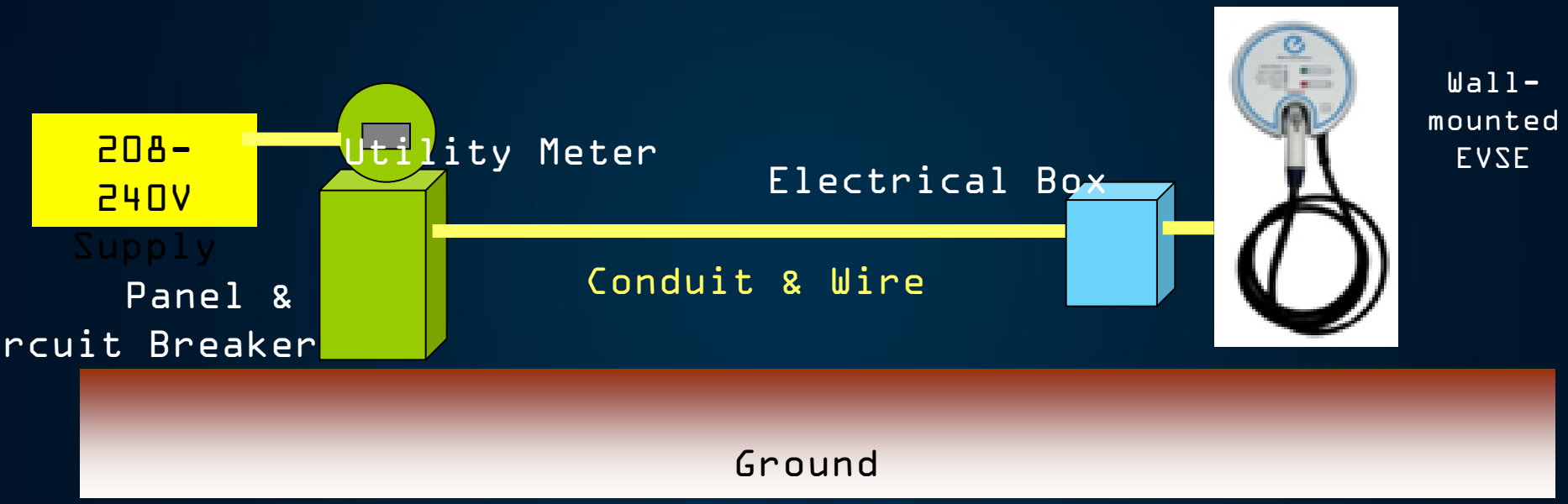
Residential Installation

- Level 2 EVSE - 40amp dedicated circuit
  - Run conduit and wiring to EVSE box location (Garage, Carport, etc)
  - Mount and hardwire the EVSE box

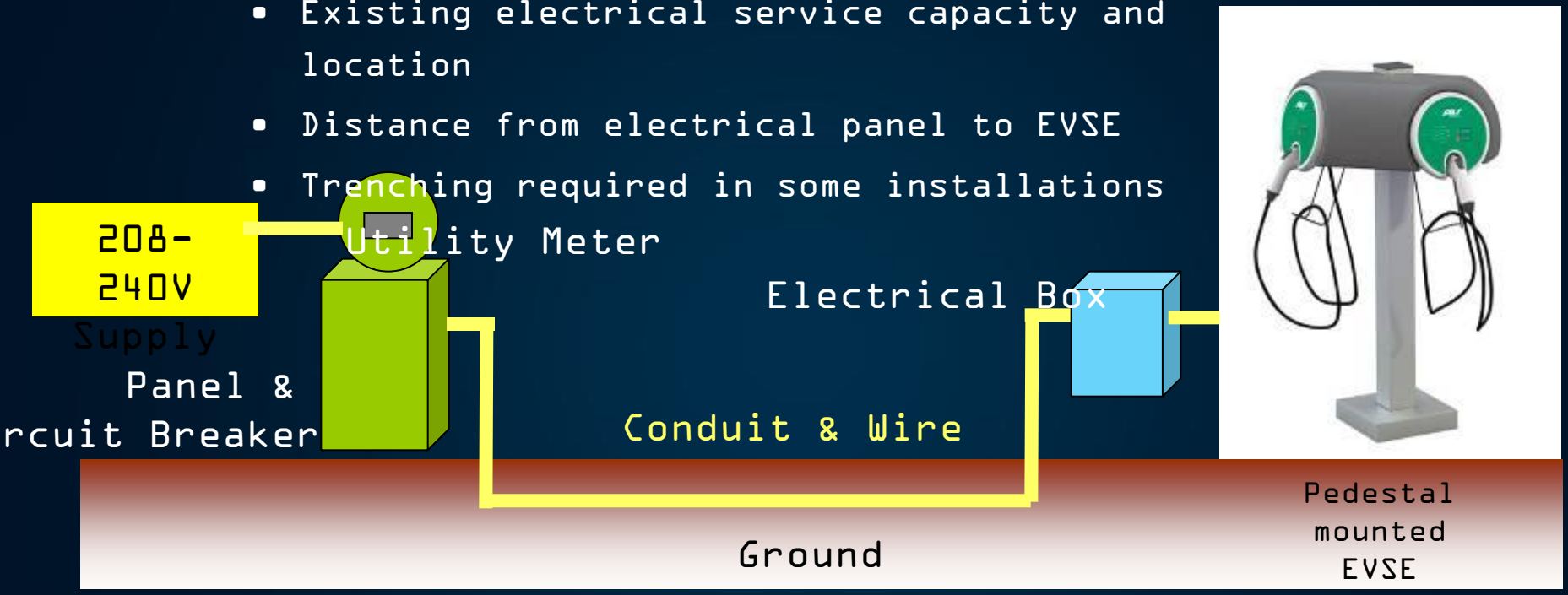


Typical Installation Costs:

Permit	Breaker / Panel	Installation &	EVSE	TOTAL
$50-$200	$50 - $700	$200 - $700	$800	$1k - $2.5k

Commercial Installation

- Level 2 EVSE - 40amp dedicated circuit
- Installation costs can vary greatly depending on:
  - Existing electrical service capacity and location
  - Distance from electrical panel to EVSE
  - Trenching required in some installations



Typical Installation Costs:

Permit	Breaker / Panel Upgrades	Installation & Materials Cost	Commercial Grade EVSE	TOTAL
$100-$300	$50 - $700	$2000 - $7000	$1k-$3k	$3k - $11k

DC Fast Charging

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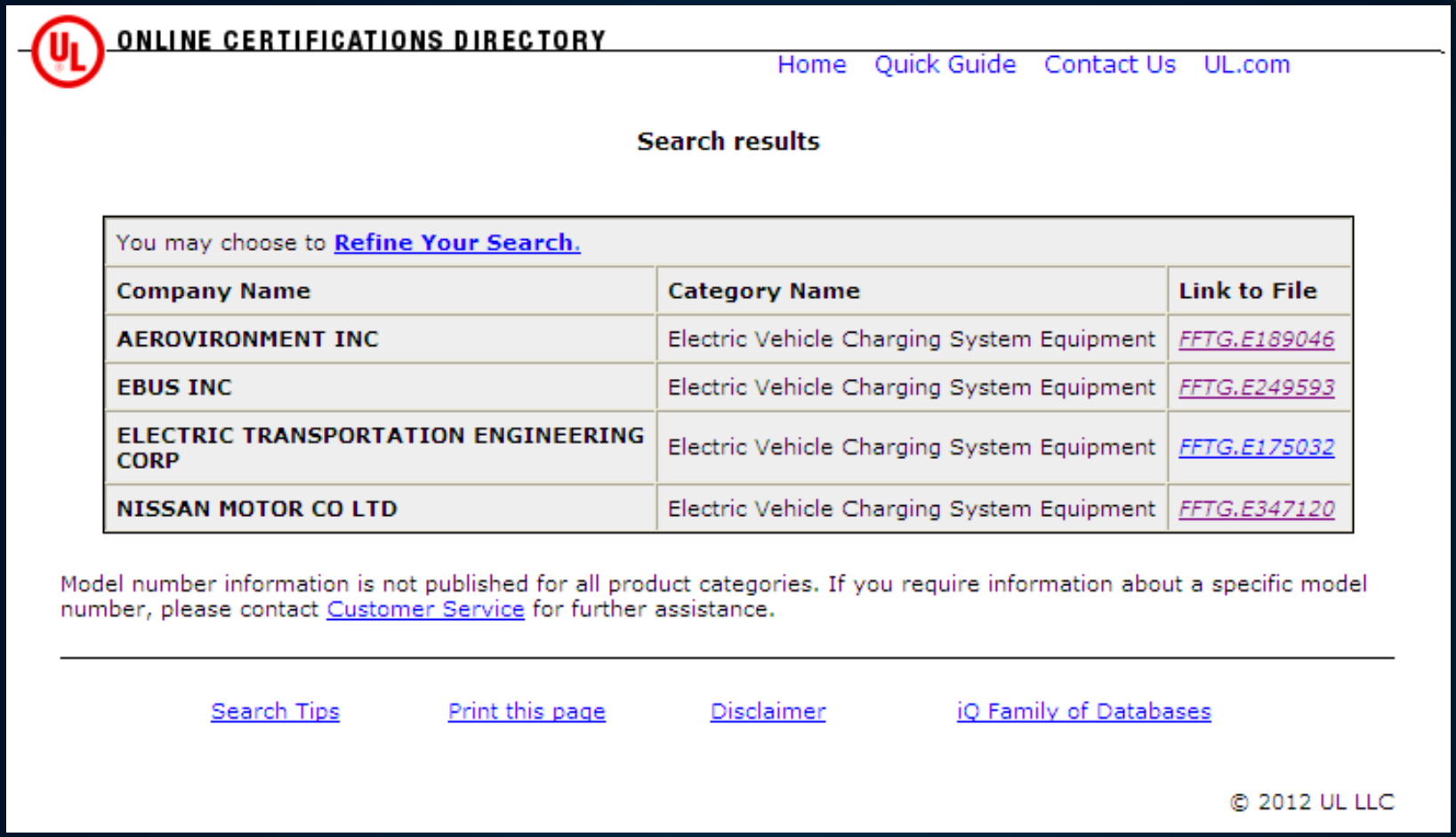
UL Certifications Directory



ONLINE CERTIFICATIONS DIRECTORY

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Search results

You may choose to **Refine Your Search.**

Company Name	Category Name	Link to File
AEROVIRONMENT INC	Electric Vehicle Charging System Equipment	FFTG.E189046
EBUS INC	Electric Vehicle Charging System Equipment	FFTG.E249593
ELECTRIC TRANSPORTATION ENGINEERING CORP	Electric Vehicle Charging System Equipment	FFTG.E175032
NISSAN MOTOR CO LTD	Electric Vehicle Charging System Equipment	FFTG.E347120

Model number information is not published for all product categories. If you require information about a specific model number, please contact Customer Service for further assistance.

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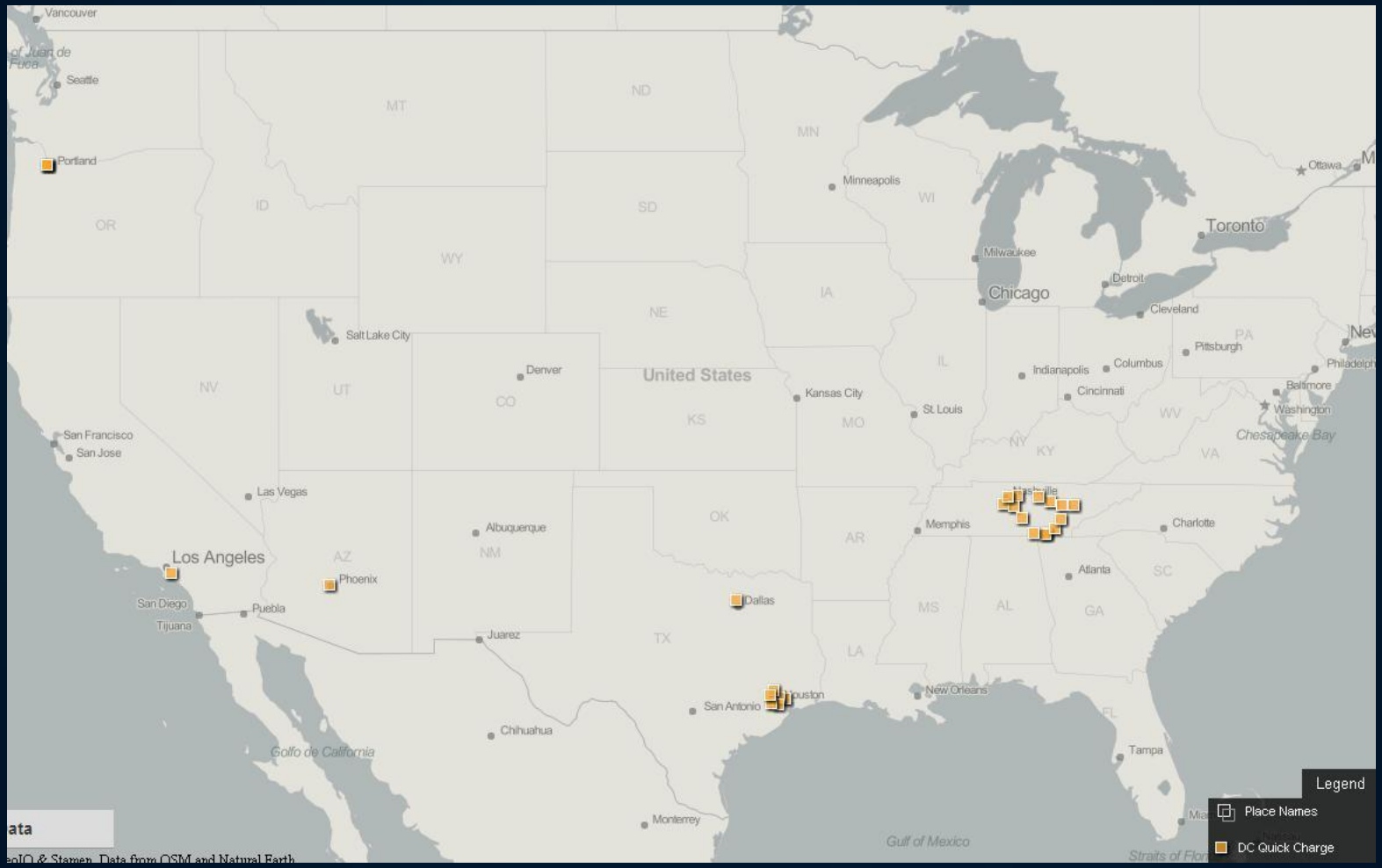
Planned DC Quick Charge Stations

Project	Planned DC QC	Region	Funding	Notes
Blink Network EV Project	340	CA – San Diego, Bay Area WA - Seattle OR - Portland AZ- Phoenix/Tucson TN – Nash/Knox/Chatta	$230M (DOE – ARRA funded)	Installations begin summer 2011
eVgo Network NRG Energy	100	Houston, TX Dallas, TX	Privately funded	50 in each city
350 Green	110	Various US Cities	State grants	Also developing private-sector partners
State of Maryland	3	Baltimore, MD	State	
Various Projects	5	Portland –PGE North Carolina - Duke Uni South Carolina – Plug in Carolina	Private/State	Currently operating

Installed DC QC Stations

CHAdeMO, publically accessible
As of December 1, 2011

Number of Stations: 27



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eVgo Freedom Station

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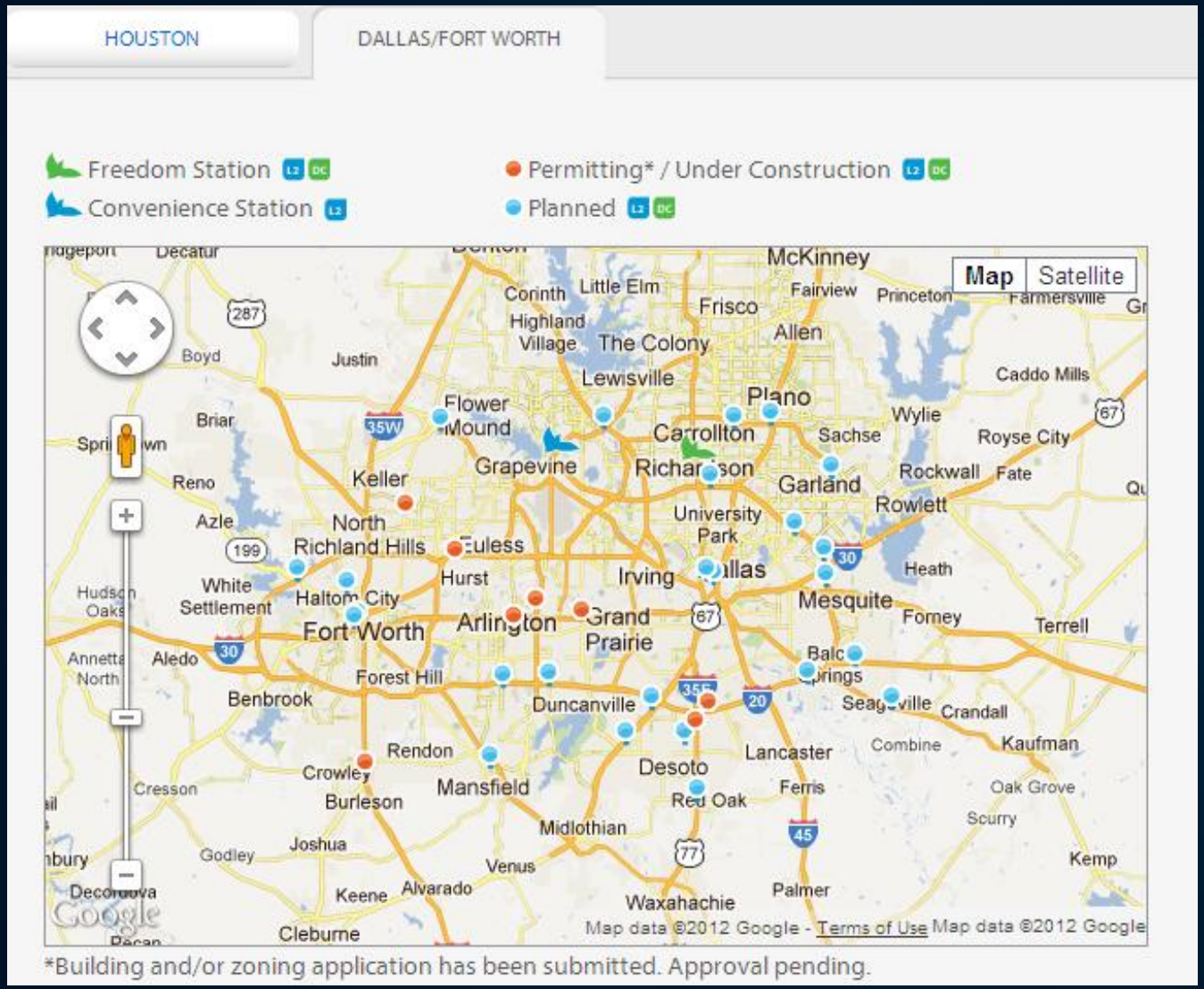
DFW: 1 operational; 3 under construction; 13 in permitting



https://www.evgonetwork.com/eVgo_Charging_Stations/

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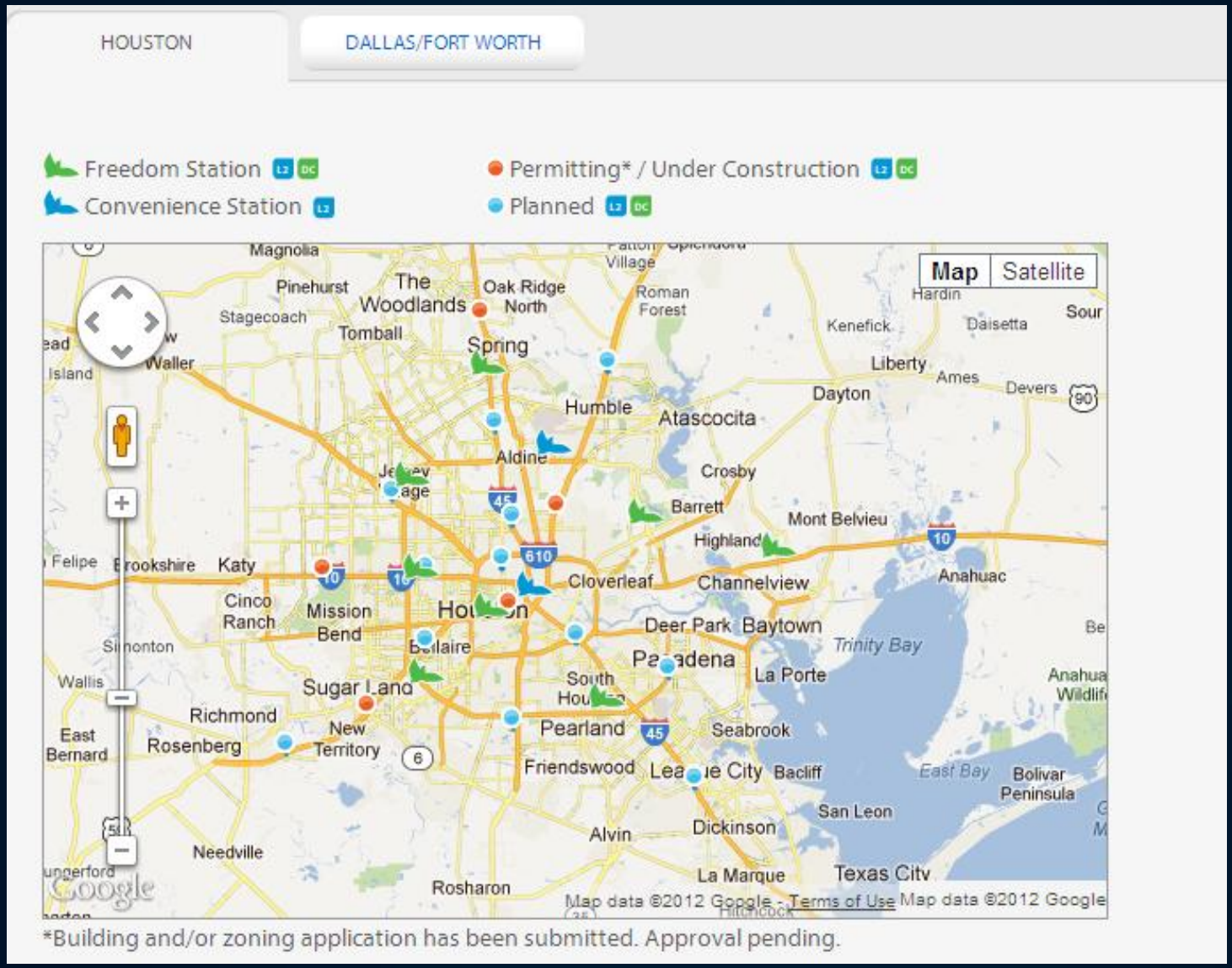
HOU: 8 operational; 4 under construction; 3 in permitting



*Building and/or zoning application has been submitted. Approval pending.

https://www.evgonetwork.com/eVgo_Charging_Stations/

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Challenges to Installation

- Some hosts do not have 480V 3P electrical service
- For hosts who do have 480V 3P service, they usually do not have 50KW+ extra panel capacity to support the DC charger.
- The hosts increasingly have underground service that is difficult or impossible to expand.
- This pushes the installation street-side to access the utility service directly with a new service drop
- Street-side installations have permitting challenges on equipment heights and setbacks
- This results in the installation being mid-parking lot with lots of boring and retail disruption
- Parking space code requirements often add an addition dedicated parking space
- In some parts of the country, these new service drops can take 6 months
- If we are lucky, the utility feeder is over-head and may only require a pole set
- If we are not lucky, the utility feeder is underground requiring an expense pad mount transformer
- The monthly demand charges run $300-700/mo plus another $50-200/mo meter charge

Governor Brown Announces $120 Million Settlement to Fund Electric Car Charging Stations Across California

- NRG will be developing the following in CA:
- 200 Public DC Fast Charging stations
- Wiring for "10,000 plug-in units at 1,000 locations across the state"
- Installations of DC Fast Charging will be in the following locations: San Francisco Bay Area; San Joaquin Valley, the Los Angeles Basin, and San Diego County
- The NRG press release state this will occur over **"the next 4 years."**

Governor Brown Announces $120 Million Settlement to Fund Electric Car Charging Stations Across California

- The Executive Order issued today by the Governor sets the following targets:

- By 2015, all major cities in California will have adequate infrastructure and be “zero-emission vehicle ready”;

- By 2020, the state will have established adequate infrastructure to support 1 million zero-emission vehicles in California;

- By 2025, there will be 1.5 million zero-emission vehicles on the road in California; and

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Governor Brown Announces $120 Million Settlement to Fund Electric Car Charging Stations Across California

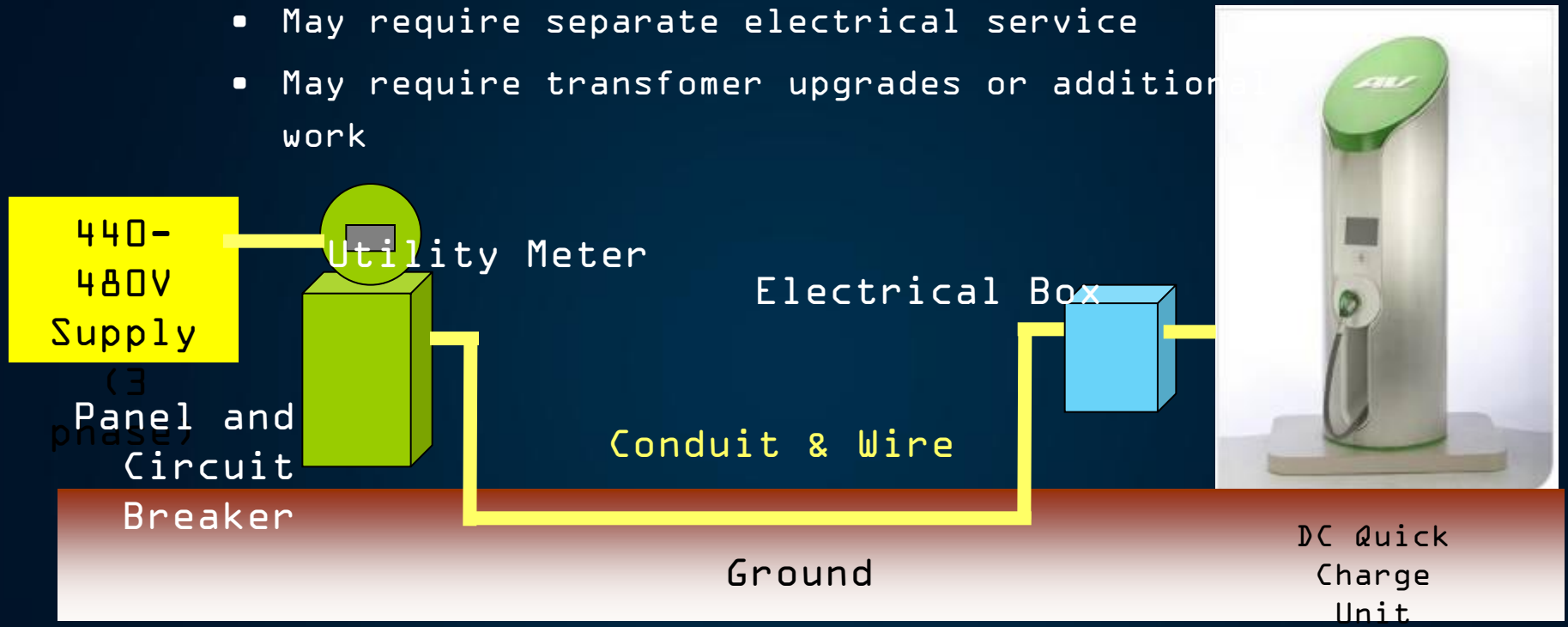
By 2050, virtually all personal transportation in the State will be based on zero-emission vehicles, and greenhouse gas emissions from the transportation sector will be reduced by 80 percent below 1990 levels.

- AB 32, the 2006 Global Warming Solutions Act, calls for a 30 percent reduction of greenhouse gas emissions by 2020. The goal of 80 percent below 1990 levels by 2050 was set by an executive order signed by former Governor Arnold Schwarzenegger.

- Last year, Governor Brown signed SB X1-2, which directed the California Air Resources Board to adopt regulations setting a 33 percent renewable energy target.

DC Quick Charge Installation

- DC Quick Charge
- Installation costs can vary greatly depending on:
  - May require separate electrical service
  - May require transfomer upgrades or additional work



Typical Installation Costs:

Permit	Breaker / Panel Upgrades	Installation &	Commercial Grade EVSE	TOTAL
$1,000	$2,000	$10,000 - $30,000	$15k-$50k	$28k - $83k

Thank you

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