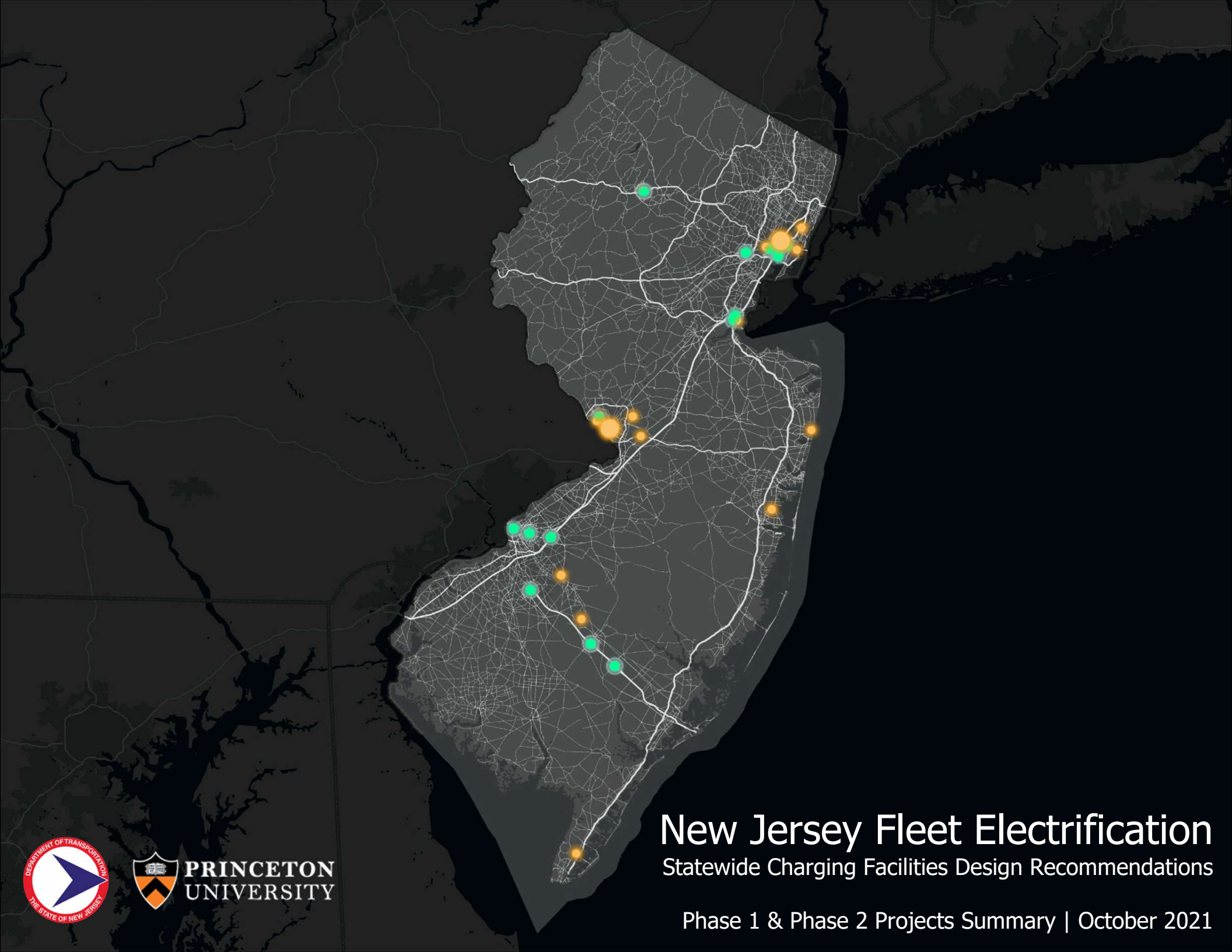

New Jersey Fleet Electrification

Statewide Charging Facilities Design Recommendations

Phase 1 & Phase 2 Projects Summary | October 2021

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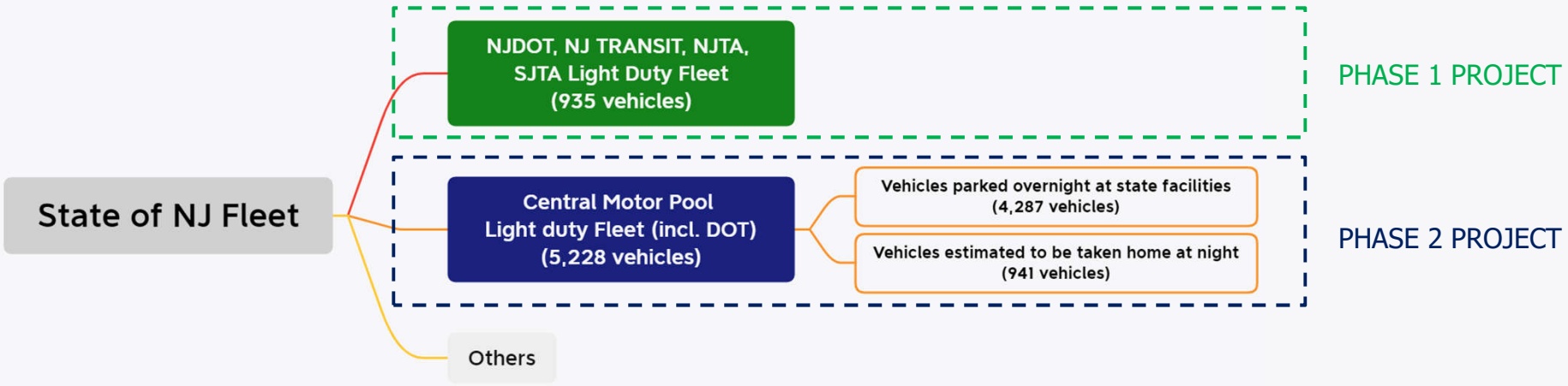
Project Objectives and Scopes



- Background:
  - Gov. Murphy's Executive Order and State Legislation to electrify NJ's light duty fleet
  - 25% electrification by Dec 2025, and 100% electrification by Dec 2035
- Main Objectives:
  - Determine which vehicles and facilities to be electrified first
  - Determine the right locations, quantity & types of EV infrastructure
- Our Approaches:
  - Statewide fleet utilization analysis
  - Cost-benefit analysis of EV charging infrastructure
  - Charging at home and commercial charging research
  - Roadmap to reach 2025 and 2035 Goals
  - Design recommendations and illustrated layouts

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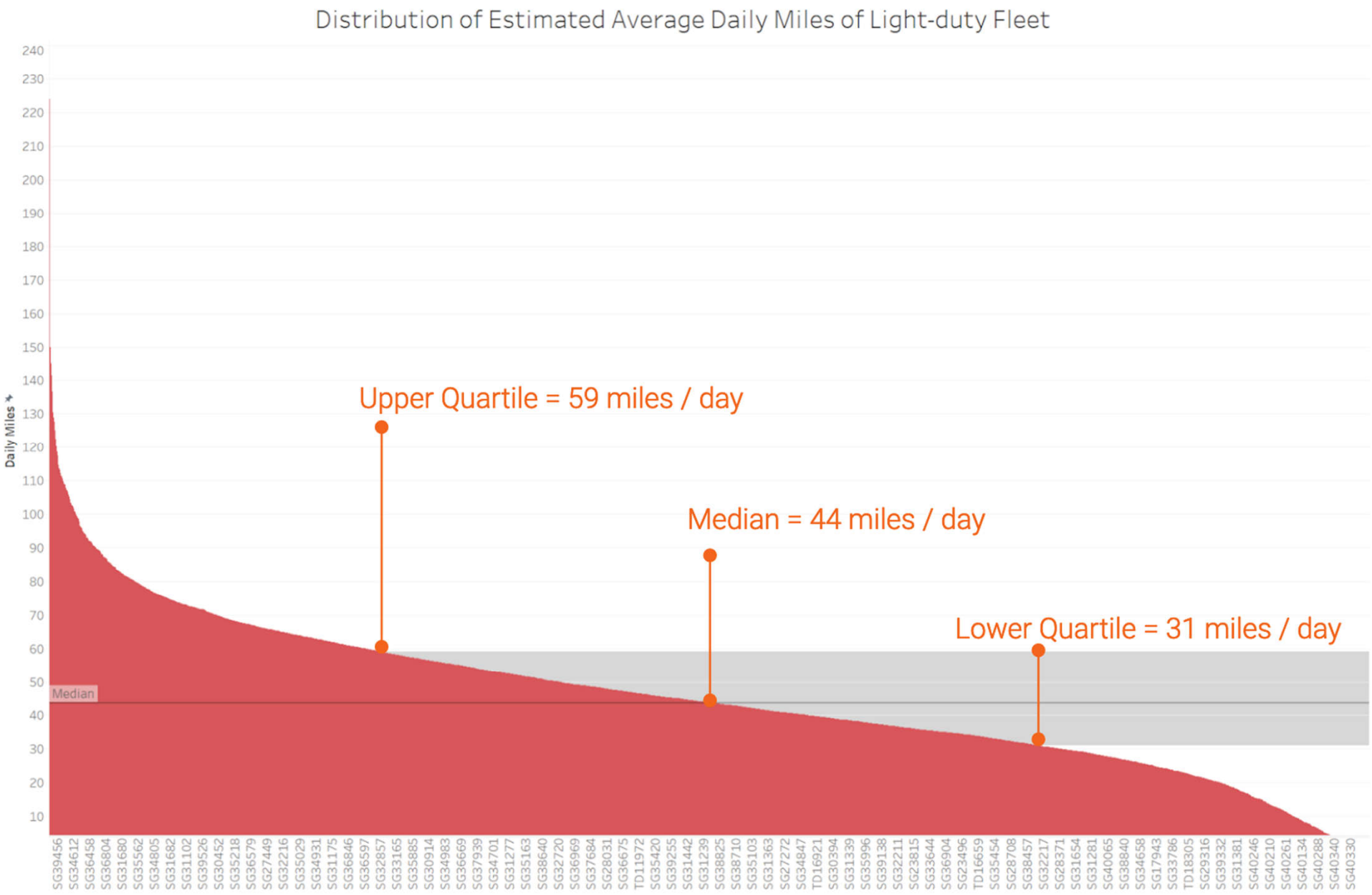
Statewide Fleet Characteristics and Utilization



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Statewide Fleet Characteristics and Utilization

METER	1992	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
0-25000															2	2	3	14	15	88	158	959	40	1,281
25000-50000				1		1	1	1	6		1	1			17	18	42	71	131	356	182	80		909
50000-75000						1		5	12	4	9	7	1		49	92	104	131	177	156	57	4		809
75000-100000	1		3	1		1	5	35	18	15	27	13	1	1	92	104	100	197	81	22	5	1		723
100000-125000			1	5			10	56	39	47	51	26	4	5	150	78	62	59	28	6				627
125000-150000		1	2		1	2	5	46	60	60	39	30	4	11	137	52	28	16	10	1				505
150000-175000				2		1	9	40	23	31	18	17	3	4	61	25	12	2	1		1			250
175000-200000			1			1	4	14	8	13	6	6	1		10	11	6	1						82
200000-225000							1	5	2	7	1	3	1		7	1								28
225000-250000							1				1													2
250000-275000								1	1				4											6
275000-300000													2	1	2									5
300000-325000															1									1
Total	1	1	7	9	1	7	36	203	169	177	153	103	21	22	528	383	357	491	443	629	403	1,044	40	5,228

Distribution of Central Motor Pool Fleet based on Meter and Model Year

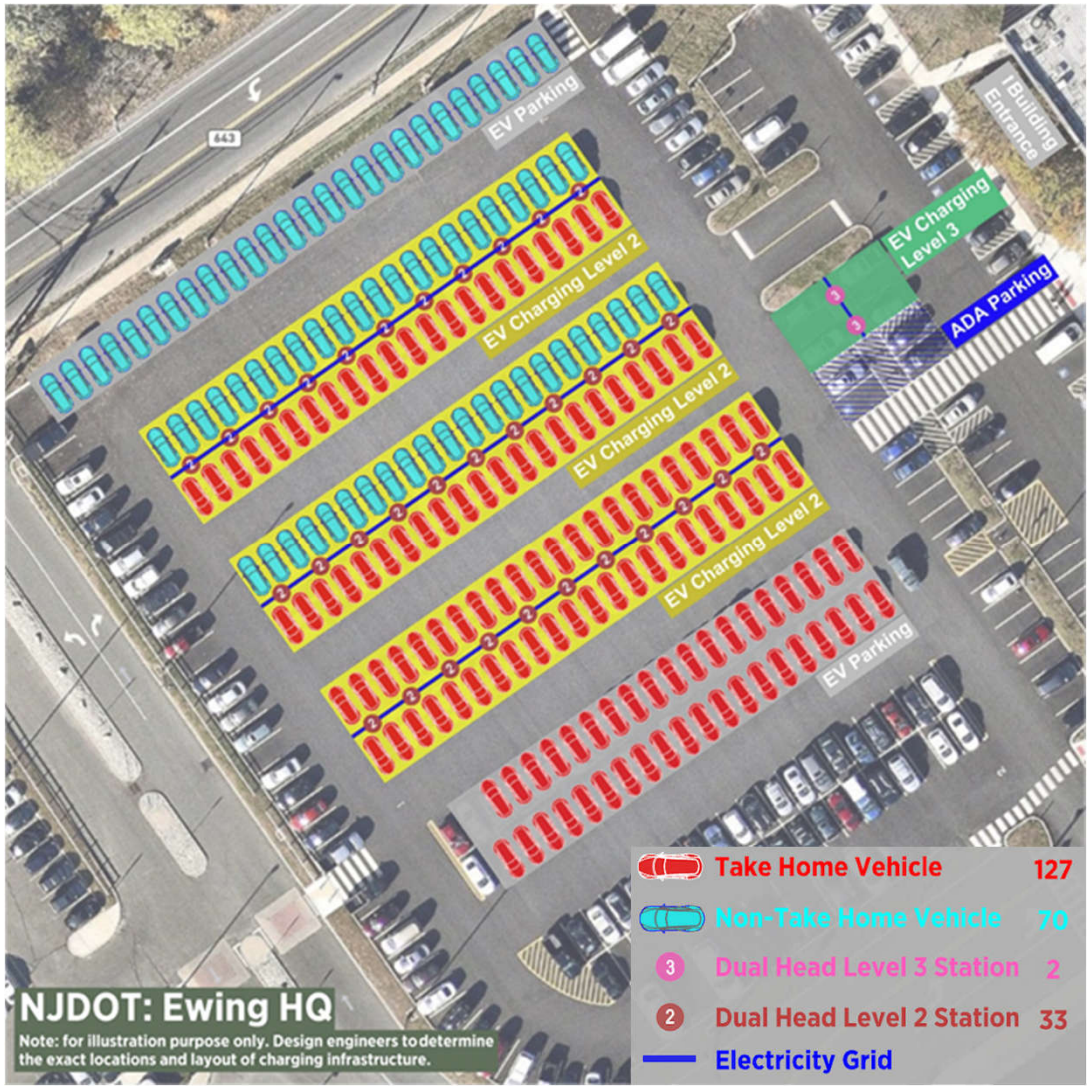
Phase 1 Project – Overview

Agencies:	**Transportation Agencies** (NJDOT, NJ TRANSIT, NJTA, SJTA)
Timeline:	**June - October, 2020**
Fleet size:	**935** vehicles
Facilities:	**21**, preselected by agencies
Deliverables:	Phase 1 Final Report

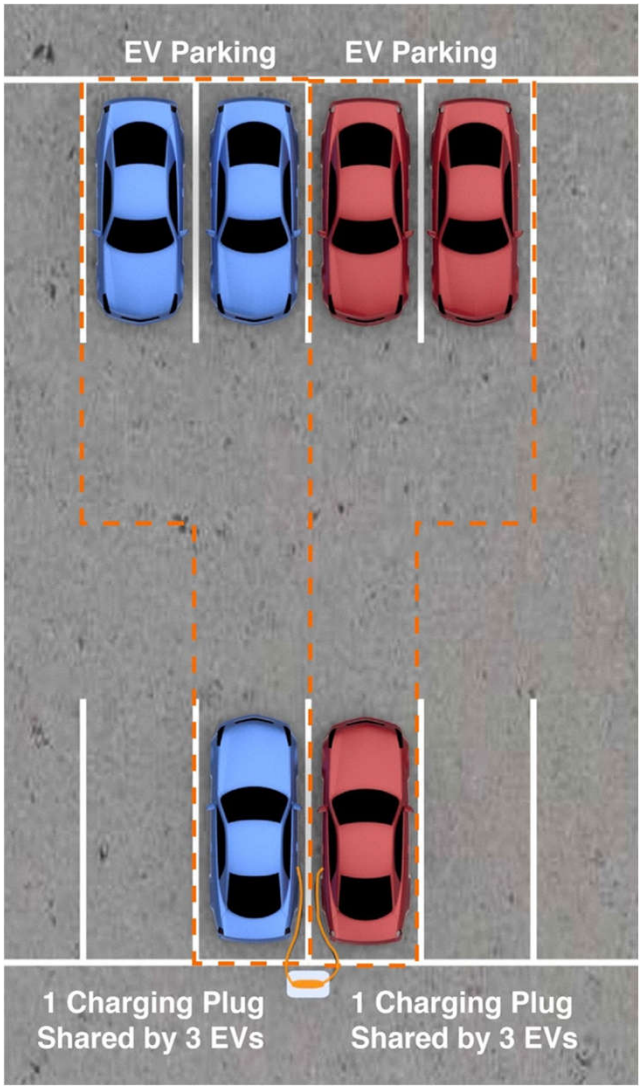
Findings & Recommendations:

1. Plug-in electric vehicles to be fully charged about **every three days**.
2. Install **make-ready infrastructure** (utility upgrade) first to tackle 2035 goal, and install chargers progressively as the fleet gets electrified.
3. Electric charging facility is about **12% to 20%** the cost of petroleum station of similar service capacity.
4. Recommended **250 Level 2 and 62 Level 3** charging plugs at 21 locations.

Phase 1 Project – Design Recommendations



Sample Recommended Charging Layout at NJDOT HQ



Dynamic Fleet Management to minimize infrastructure cost and maximize charging station utilization.

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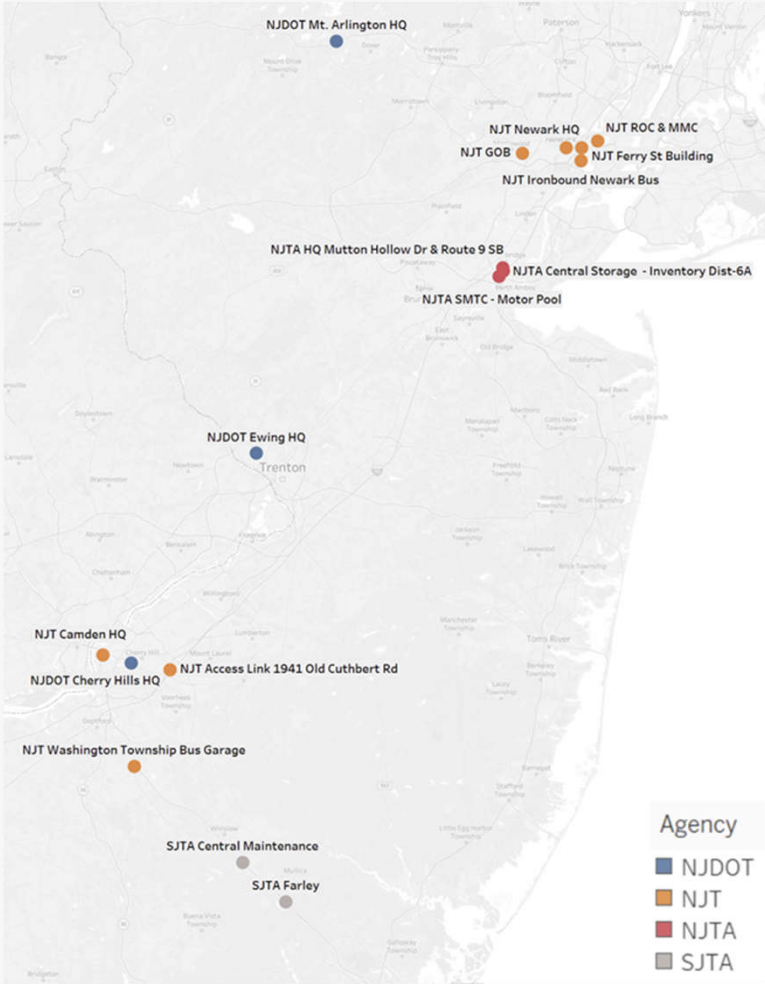
Phase 1 Project – Facilities to be Electrified

Agency	Location	Level 2 Plugs [1]	Level 3 Plugs [1]	Estimated Total Cost [2]
NJDOT	Ewing HQ	66	4	$848,000
NJDOT	Mt. Arlington HQ	10	0	$100,000
NJDOT	Cherry Hills HQ	10	0	$100,000
	NJDOT Subtotal	86	4	$1,048,000
NJT	Newark HQ (already installed) [3]	6	0	N/A
NJT	Newark HQ (excluding already installed)	46	12	$1,826,000
NJT	GOB	10	4	$500,000
NJT	North Shop (600 Doremus Ave Newark)	4	2	$300,000
NJT	Ironbound Newark	3	1	$162,500
NJT	South Shop (6000 RT 42 Turnersville)	3	1	$162,500
NJT	Washington Township Bus Garage	4	2	$300,000
NJT	Camden HQ	4	4	$440,000
NJT	ROC & MMC	6	2	$286,000
NJT	Ferry St Building 2	4	2	$300,000
NJT	Ferry St Building 3	4	2	$300,000
NJT	Access Link Facility	18	0	$180,000
	NJT Subtotal	112	32	$4,757,000
NJTA	HQ Building 1 Turnpike Plaza Woodbridge	12	6	$720,000
NJTA	Central Storage Motorpool Dist 6A	12	6	$720,000
NJTA	NJ Statewide Traffic Management Center	12	6	$720,000
	NJTA Subtotal	36	18	$2,160,000
SJTA	Administration Building	4	4	$440,000
SJTA	E&O Building, Hammonton Yard (Central Maintenance)	4	4	$440,000
SJTA	Transportation Services Department (Blackwood Office Complex) [4]	8	0	$80,000
	SJTA Subtotal	16	8	$960,000
	Total	250	62	$8,925,000



250 Level 2 Plugs + 62 Level 3 Plugs recommended at 21 State Facilities

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Phase 2 Project – Overview

Agencies: **All Central Motor Pool Agencies** (Treasury, DEP, Gov, etc.)
Timeline: **Jan - August, 2021**
Fleet size: **5,228** vehicles
Facilities: **21**, Our Recommendation
Deliverables: Phase 2 Final Report

Findings & Recommendations:
(in addition to Phase 1 Project)

1. Three-pronged charging strategy:
   1) at **State facilities**
   2) at **commercial** charging locations
   3) at **home**
2. An **equitable distribution** of electrification effort among departments and agencies
3. Guiding **roadmap** for agencies to reach the 2025 (25%) and 2035 (100%) goals
4. Recommended # of chargers and layouts at **21 facilities** for 2025 & 2035

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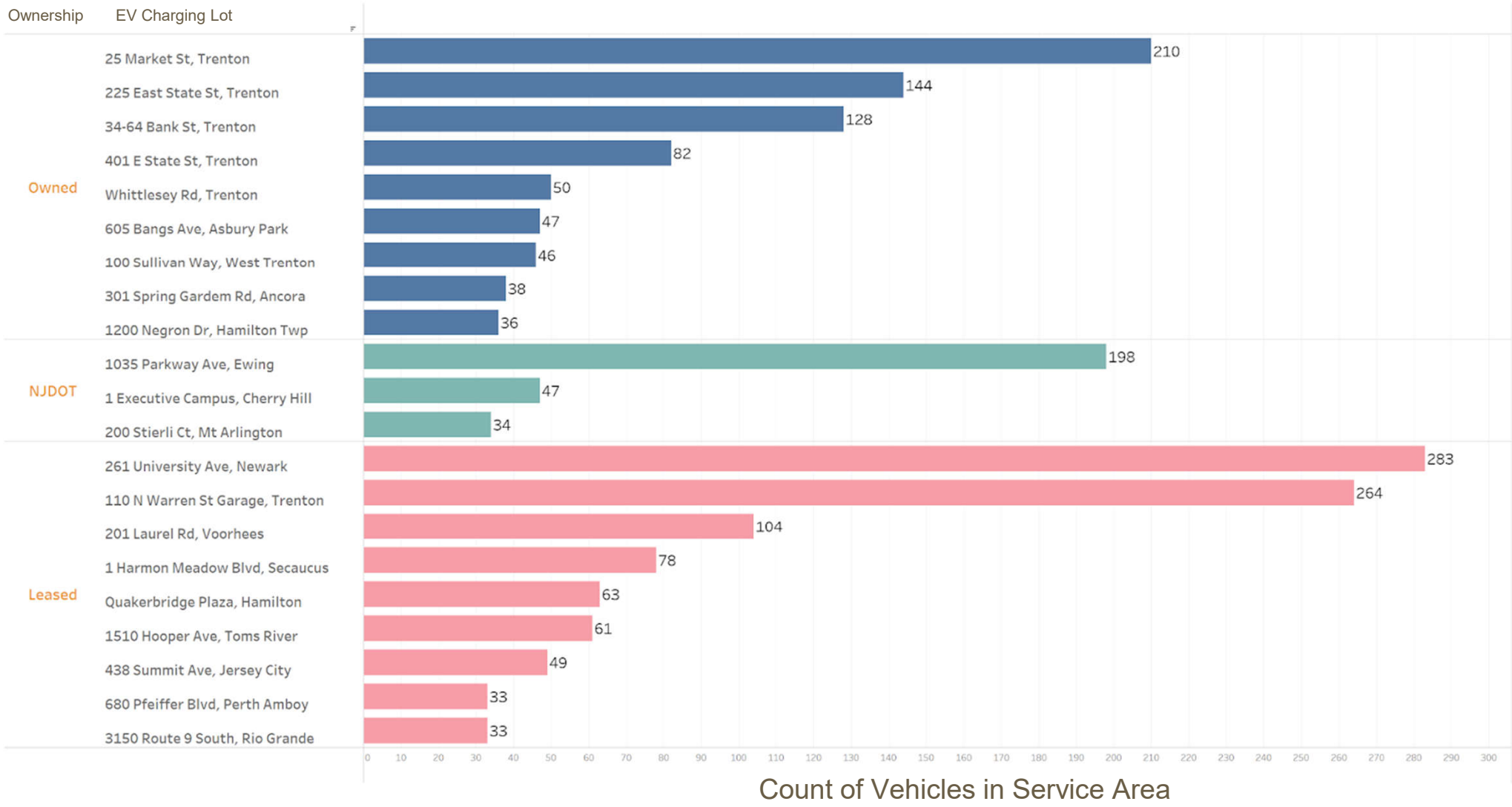
Phase 2 Project – 21 Charging Facilities Recommended



Recommended installation of EV Charging Ports @ 21 facilities:

By **2035**: 676 Level 2 & 44 Level 3 Charging Ports

By **2025**: 338 Level 2 & 22 Level 3 Charging Ports

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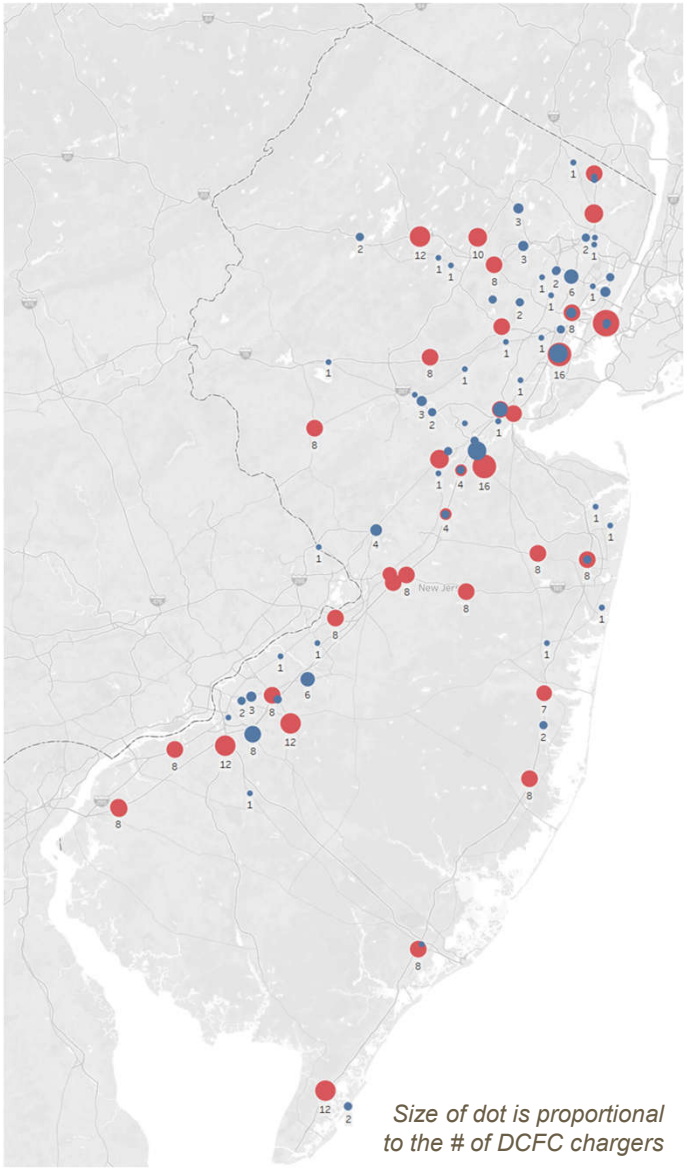
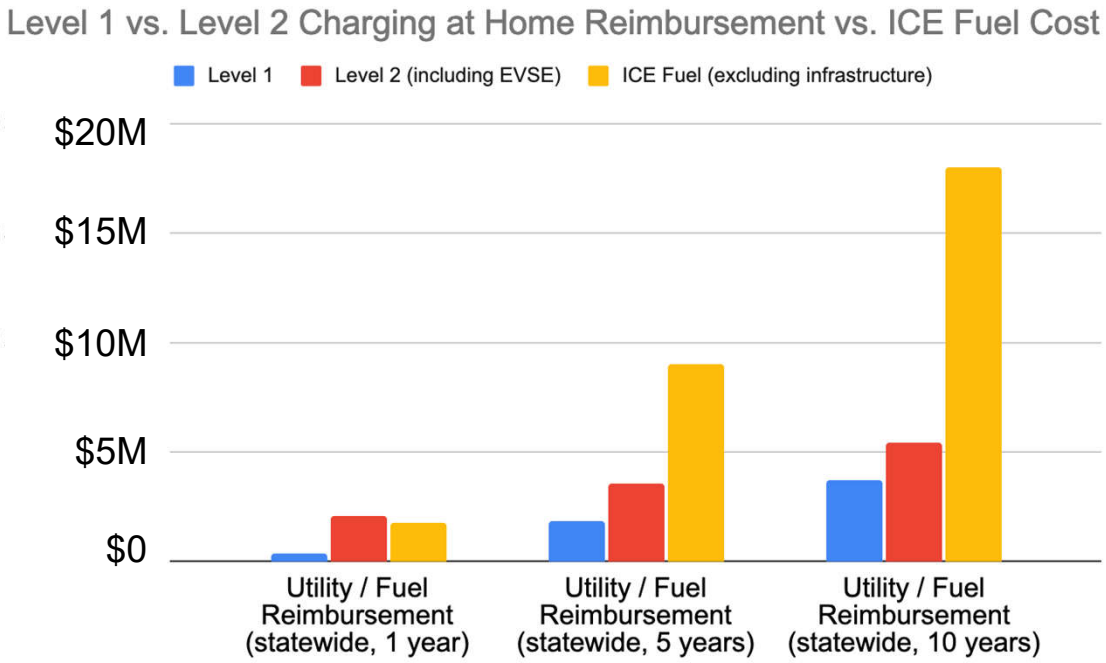
Phase 2 Project – Commercial & At-Home Charging Research



Existing Publicly Available Level 3 DCFC Chargers in NJ

(As of July 28, 2021; Source: NJDEP)



- Cost of installation & reimbursements for **EV charging at home is substantially smaller** than that of traditional ICE refueling.
- Cost savings is even bigger if ICE fueling station infrastructure cost is taken into consideration.

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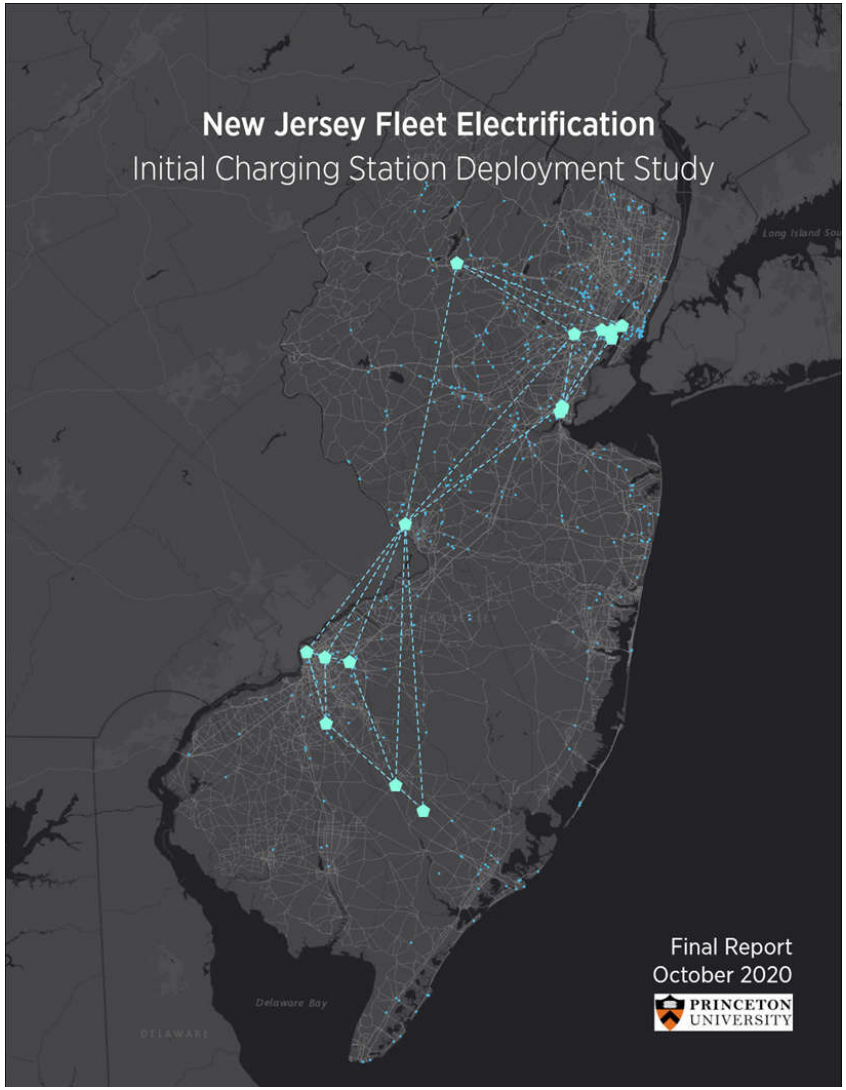
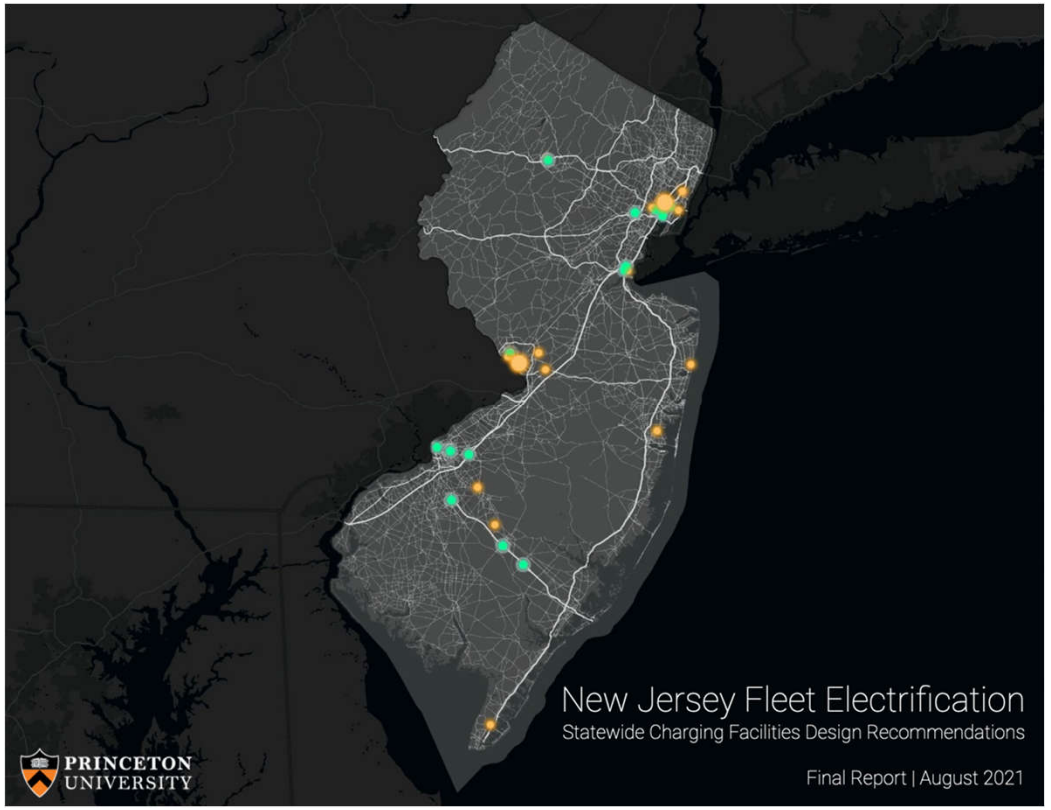
Phase 1 & 2 Projects – Final Reports



Link to Phase 1 Project Final Report



Link to Phase 2 Project Final Report

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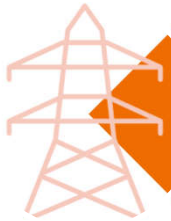
Addressed the "What", Next Steps: Need to address the "How"

EV fleet management

- Design of charging protocols for both employees and fleet managers
- Dynamic Fleet Management
- Inter-department Charging Compatibility



Preparation for the New "EV" Normal:

- Impact study on the electric grid
- Utility upgrade strategies
- Impact study on gas tax revenues

Department-specific Execution of Electrification

- e.g. Department of Children and Families

Electrify additional locations statewide

- To prepare for 100% electrification by 2035
- To provide equitable charging for all agencies and NJ Residents

Thank you!

We remain eager to help make New Jersey the cleanest State and leader in electrification.

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