



Jericho UFSD Zero Emission Vehicle Transition Plan

September 11, 2025



Agenda

Introduction of Wendel Team

NYS ZEV Mandate

Scope of Work

Bus Routes

Utility Requirements

Phasing & Costs

Who is here today



Adam Kaufman, EIT
Project Manager



Wendel has a strong practice in the **transportation sector** and provides planning, design and execution services for **Battery Electric Vehicles, charging infrastructure and operation facilities.**

Wendel also has a strong **alternative fuels** group that provides consulting services for propane, compressed natural gas, battery electric vehicles and hydrogen fueled vehicles.

Services Wendel Offers:



ARCHITECTURE
INTERIOR DESIGN
LANDSCAPE ARCHITECTURE



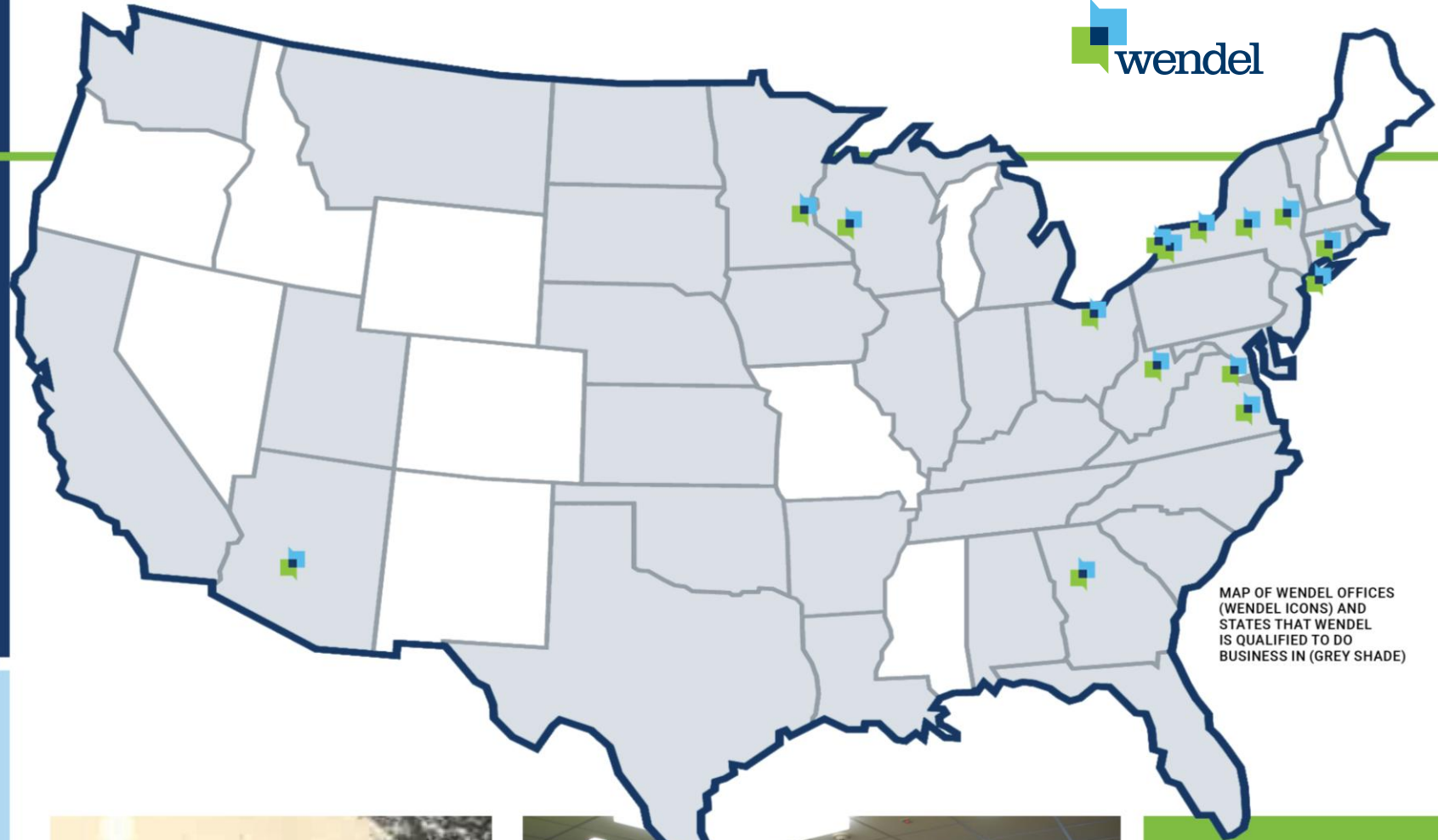
ENGINEERING
CIVIL
ELECTRICAL
ENVIRONMENTAL
MECHANICAL
MUNICIPAL
STRUCTURAL
TRANSPORTATION
RAILROAD
ALTERNATIVE FUEL SOLUTIONS/CNG
WATER/WASTEWATER RETROFITS
LAND SURVEYING
GEOGRAPHIC INFORMATION SYSTEMS (GIS)
PLANNING



ENERGY EFFICIENCY
ENERGY AUDITS
COMMISSIONING
PROFESSIONALLY ASSISTED PERFORMANCE CONTRACTING
ALTERNATIVE FUNDING/GRANT PROGRAMS
RETROFIT AND IMPLEMENTATION DESIGN
GREEN BUILDING DESIGN
MEASUREMENT & SAVINGS VERIFICATION (M&V)
RENEWABLE TECHNOLOGIES



CONSTRUCTION MANAGEMENT
MASTERBUILDER
PROGRESSIVE DESIGN/BUILD
DESIGN/BID/BUILD
CONSTRUCTION MANAGEMENT AT RISK (CMAR)
CM AGENT
GMP DESIGN/BUILD



300+ Employees
16 Offices Nationwide



27

Registered Architects

37

Professional Engineers

16

Certified Energy Managers

Services Wendel Offers:



ARCHITECTURE
INTERIOR DESIGN
LANDSCAPE ARCHITECTURE
HISTORICAL RESTORATION/PRESERVATION



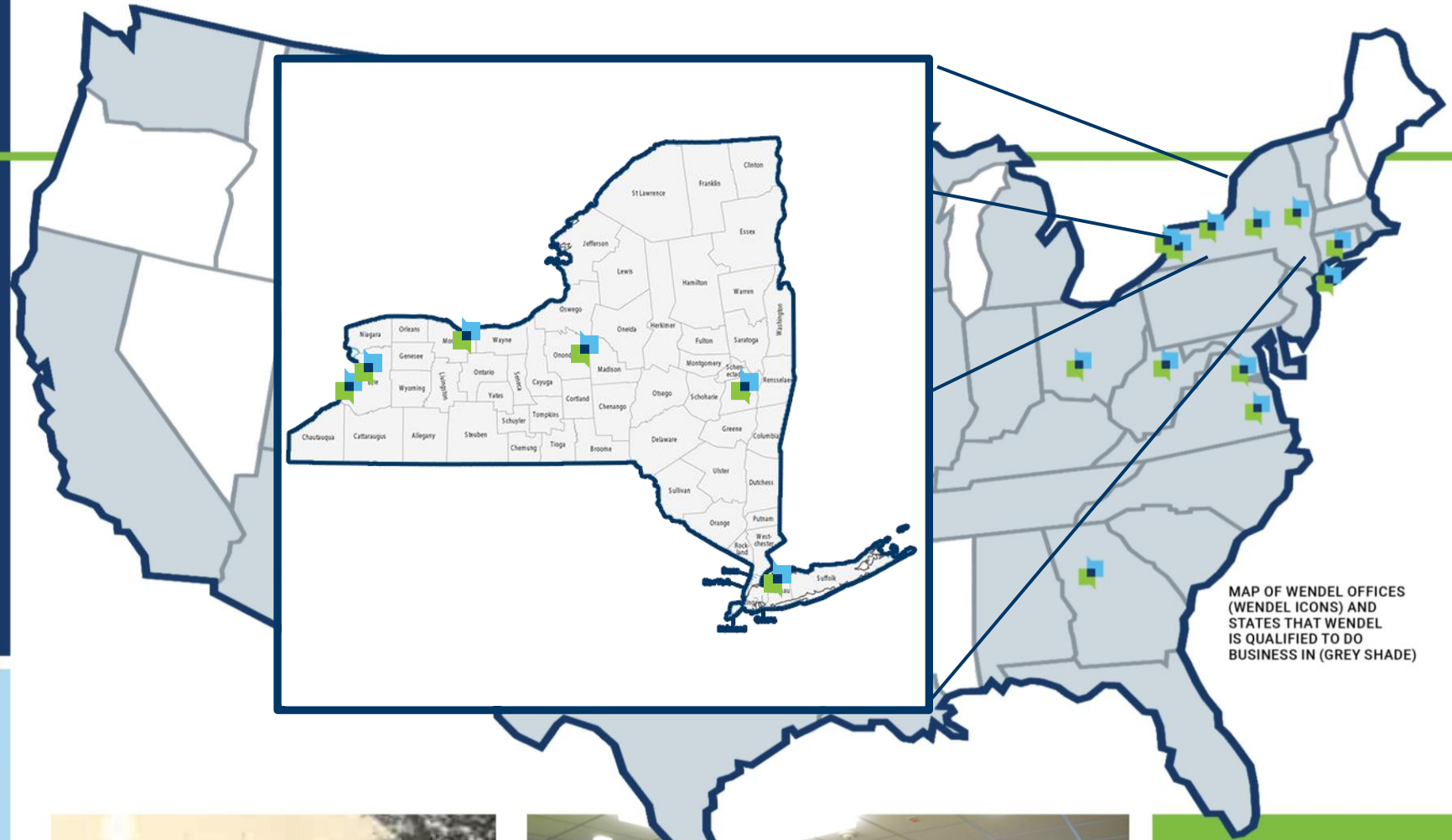
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CONSTRUCTION MANAGEMENT AT RISK (CMAR)
CM AGENT
GMP DESIGN/BUILD



MAP OF WENDEL OFFICES (WENDEL ICONS) AND STATES THAT WENDEL IS QUALIFIED TO DO BUSINESS IN (GREY SHADE)



National Presence,
Local Feel.



Zero-Emission Bus Mandate

- By **2027** all new school bus purchases need to be zero-emissions. By **2035** all school buses on the road need to be zero-emissions.
- The Senate is requiring the state to identify barriers to the 100% by **2035** goal so that they may be resolved early.
- New York State Energy Research and Development Authority (NYSERDA) is being tasked to provide technical assistance to school districts as they navigate the transition to 100% electric buses.





Scope of Work

The FlexTech Zero Emission Vehicle Transition Plan Consisted of the Following Tasks:

TASK 1 – Project Kickoff and Status Meetings

TASK 2 – Data Collection

TASK 3 – Route Analysis

TASK 4 – Conceptual Charging Strategy

TASK 5 – Electric Utility Analysis

TASK 6– Concept Development and Phasing Plan

TASK 7 – Transition Plan Cost Estimates

TASK 8 – Final Report

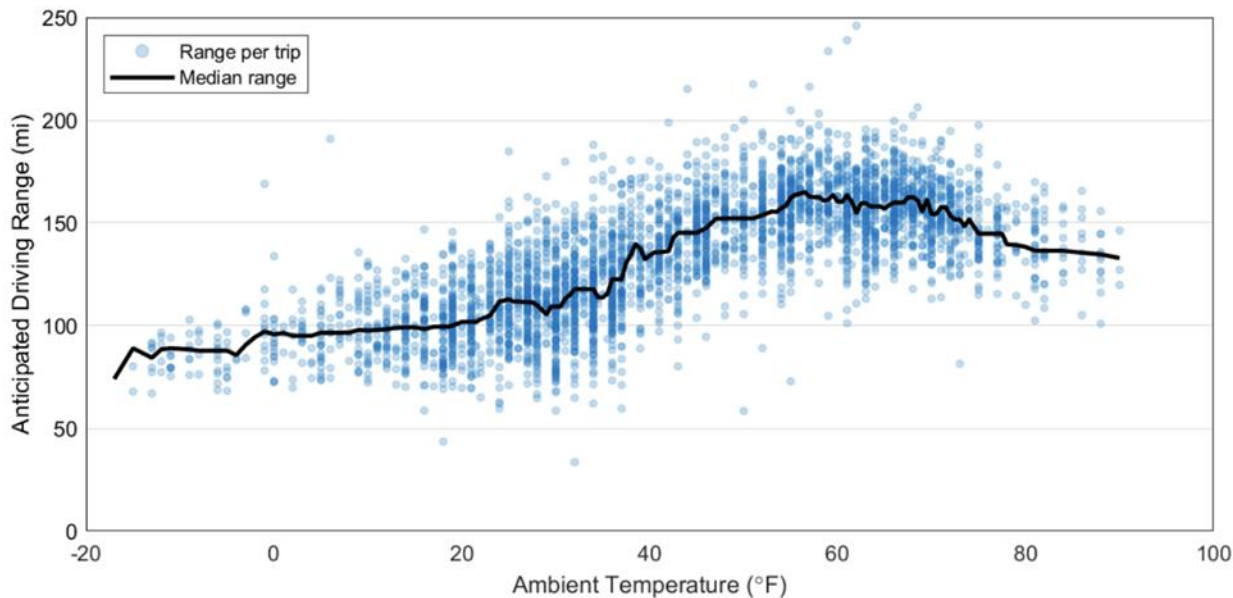
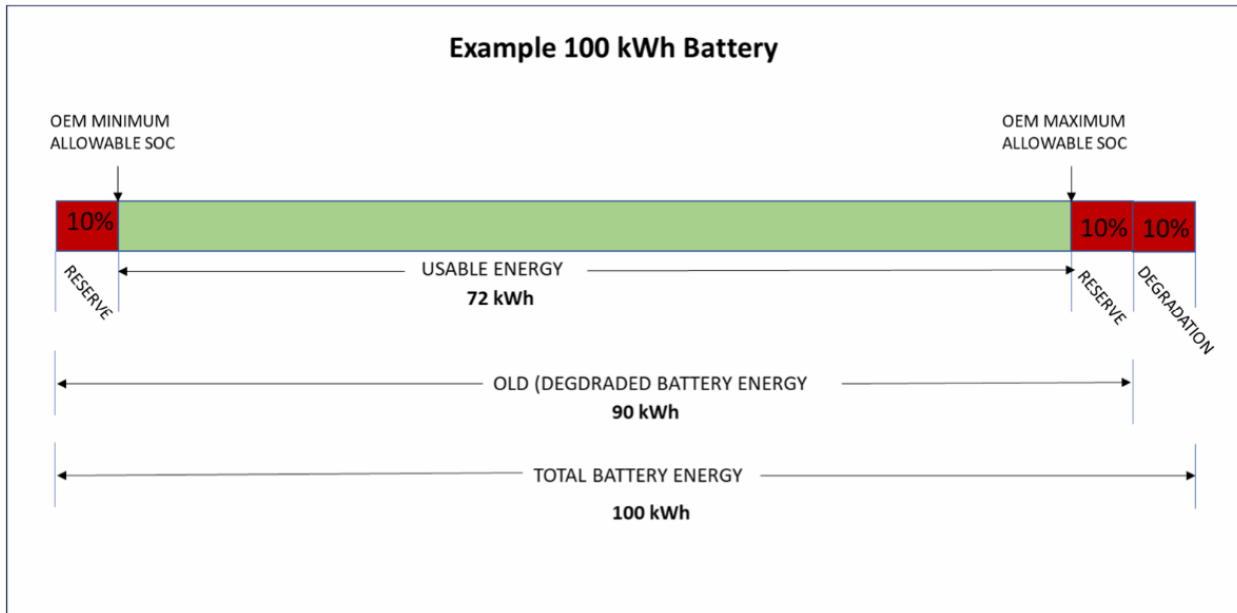


Route Analysis & Conceptual Charging Strategy

Wendel analyzed current bus route data resulting in:

- Anticipated energy requirements per route
- Minimum battery size requirements
- Feasibility of use of electric bus on current routes
- Charging requirements
- Minimum charging durations per route
- Peak energy usage impact





Route Analysis Assumptions

- Full Bus
- Extreme Cold
- HVAC usage including 15 minutes of pre-heating
- Bus has degraded to 90%
- Battery does not go below 10%
- Battery does not charge above 90%
- 11% Safety factor on efficiency



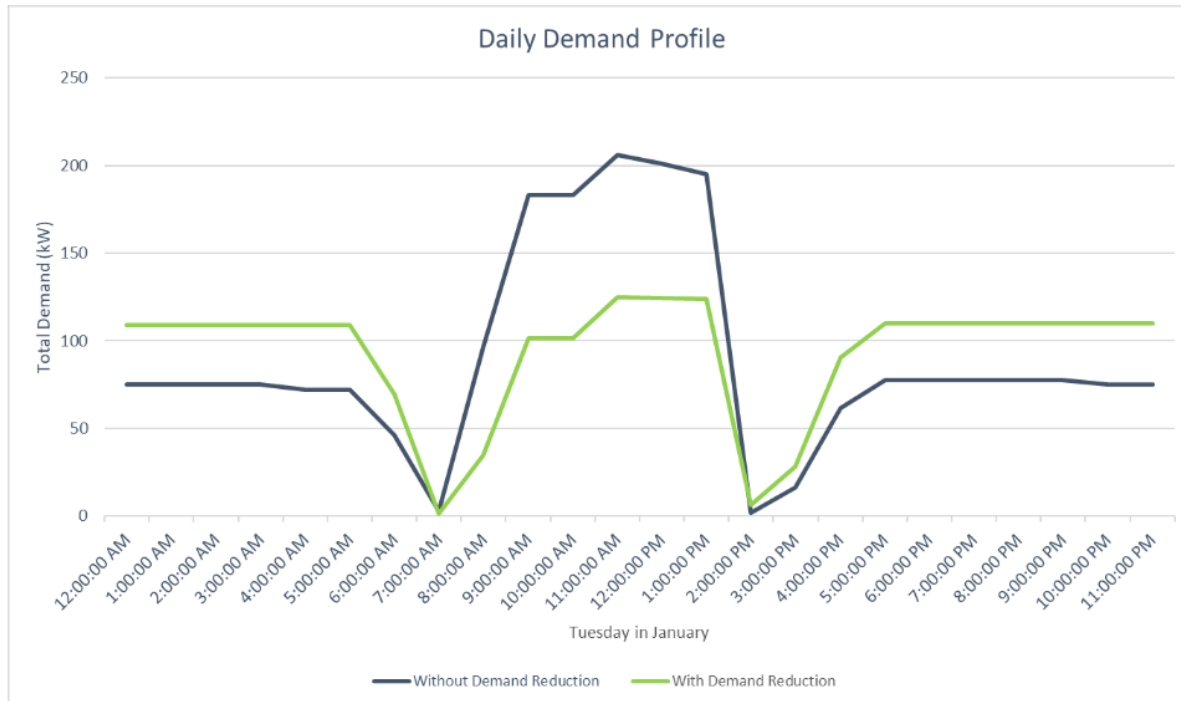
Bus Routes

- Evaluation of 16 existing route buses
- 94% of current routes can be completed with current technology
- The routes of 1 buses cannot be completed with current technology

Buses	Bus Size based on District Preferred Manufacturer	Bus Type	Route Buses	Spare Buses	Total Buses	Total Proposed BEBs
	246 kWh - Thomas	Type C	8	1	9	9
	244 kWh - Thomas	Type D	1	1	2	2
	175 kWh - Blue Bird	Type A	6	2	8	8
	No Current Replacement	Type A	1	0	1	1
			16	4	20	20

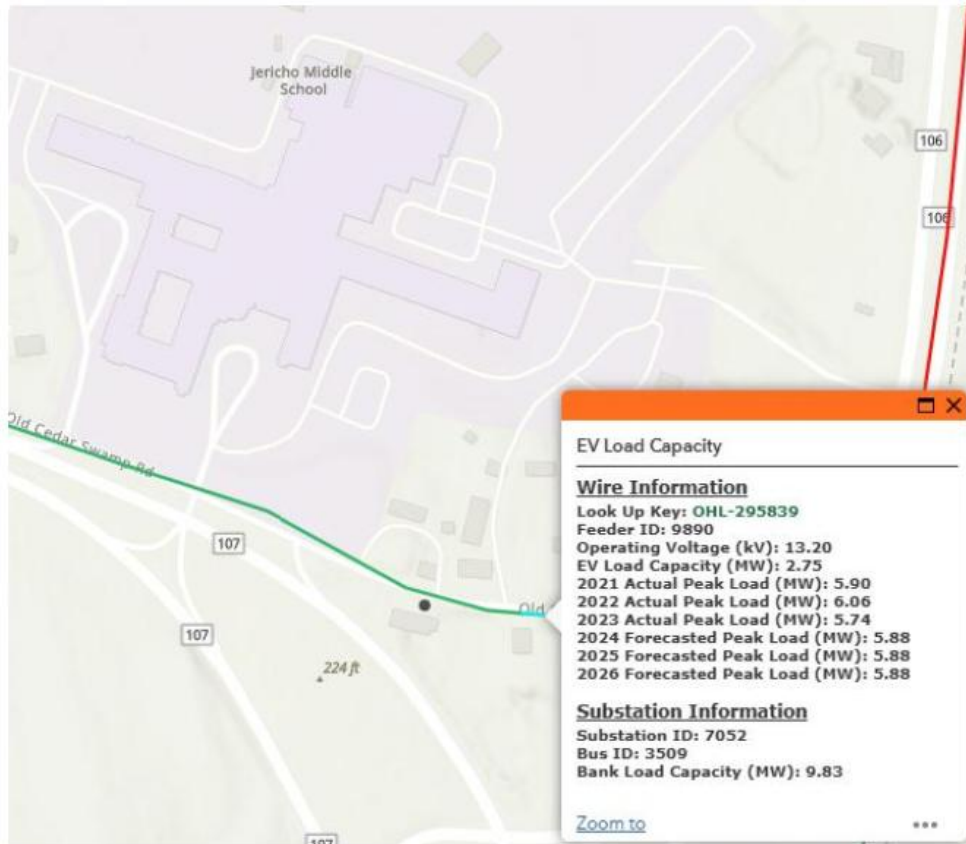
Chargers	Charger Size	Route Bus Charger	Spare Bus Chargers	Total Chargers	Total Proposed Chargers	Total Proposed Charging Positions
	24 kW	15	2	17	17	17
	60 kW	1	0	1	1	1
	120 kW	0	1*	1	1	2
		16	3	19	19	20

Charging Model Results



Before Demand Reduction		
Maximum combined bus electrical demand	206.1	kW
Day of Week Max Demand Occurs	Tuesday	
Time Max Demand Occurs Between	11:00 AM	12:00 PM
After Demand Reduction		
Maximum combined bus electrical demand	124.6	kW
Day of Week Max Demand Occurs	Tuesday	
Time Max Demand Occurs Between	11:00 AM	12:00 PM
Savings		
Demand Reduction	81.6	kW
Percent Demand Reduction	40%	

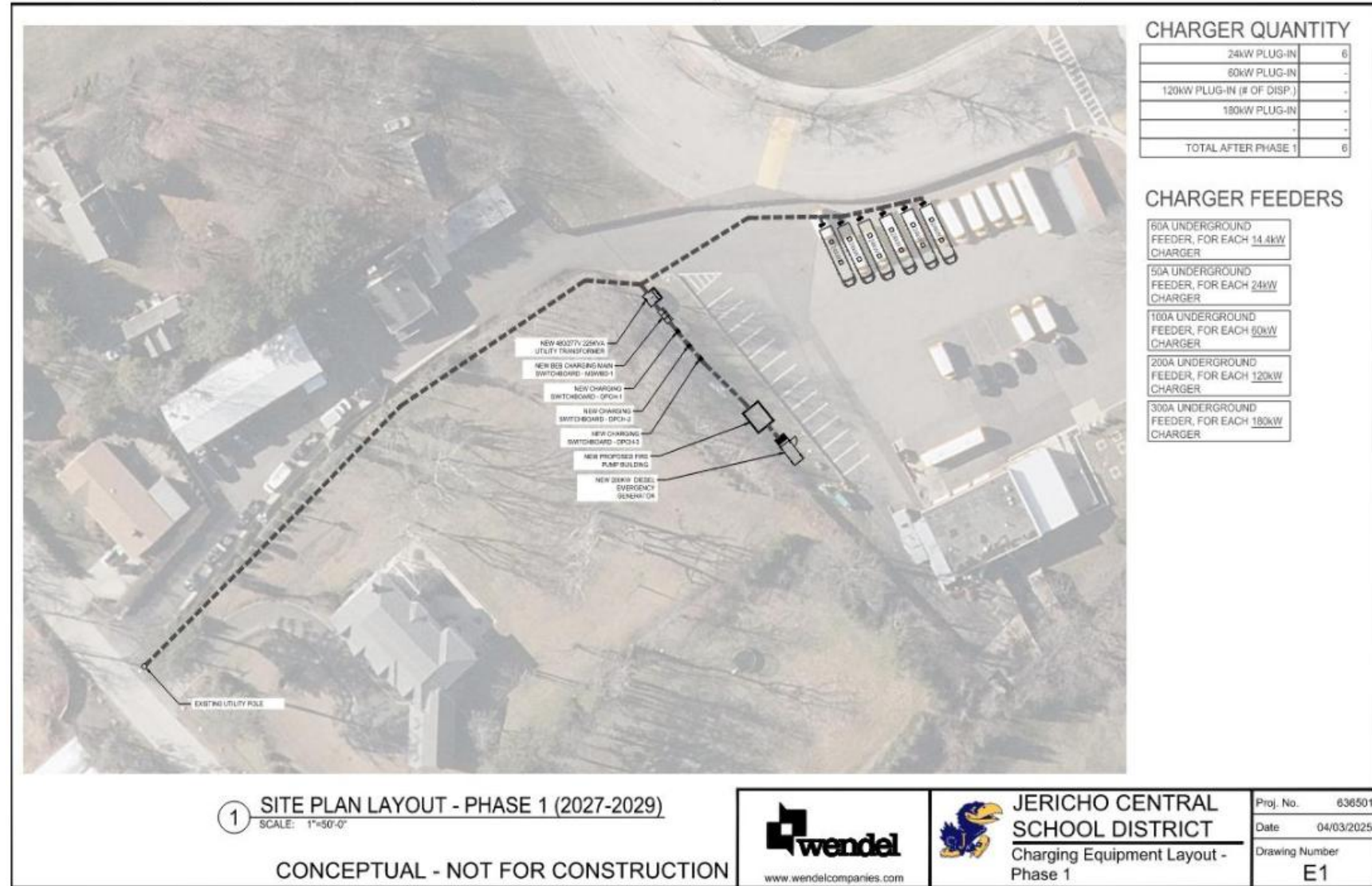
Utility Requirements



Peak Demand	Fully Connected Peak BEB Demand/ Load:	641 kVA
	Anticipated Peak BEB Demand/ Load:	185 kVA
District-side Infrastructure	The district will need a new 480V, 3-phase electric service fed from a new 225 kVA transformer. A new 2000A switchboard lineup will be required to charging equipment and additional distribution switchboard. See Conceptual Development and Phasing Plan.	
	See Section 7 Concept Development & Phasing Plan for more information.	
Utility-side Infrastructure	The utility, PSEG will need to provide underground primary feeder to the proposed transformer. PSEG has completed their feeder study and determined that the estimated cost of their upgrades is \$38,999.44.	

Phase 1

- Charger Quantity
 - 24kW – 6
- Total Chargers in Phase 1 - 6
- Phase 1 Charging Infrastructure Cost
 - \$1,428,000



Phase 1- Fire Protection

- Fire Protection Cost
 - \$1,565,000



Phase 2

- Charger Quantity
 - 24kW - 4
 - 120kW - 1
- Phase 2 Charger Quantity - 5
- Total Quantity after Phase 2 - 11
- Phase 2 Charging Infrastructure Cost
 - \$545,000



PHASE	CHARGER TYPE	QUANTITY
PHASE 1	24kW PLUG-IN	8
	60kW PLUG-IN	-
	120kW PLUG-IN (# OF DISP.)	-
	180kW PLUG-IN	-
PHASE 2	24kW PLUG-IN	4
	60kW PLUG-IN	-
	120kW PLUG-IN (# OF DISP.)	1(2)
	180kW PLUG-IN	-
TOTAL AFTER PHASE 2		11

60A UNDERGROUND FEEDER, FOR EACH 14.4kW CHARGER
50A UNDERGROUND FEEDER, FOR EACH 24kW CHARGER
100A UNDERGROUND FEEDER, FOR EACH 60kW CHARGER
200A UNDERGROUND FEEDER, FOR EACH 120kW CHARGER
300A UNDERGROUND FEEDER, FOR EACH 180kW CHARGER

1 SITE PLAN LAYOUT - PHASE 2 (2030-2032)
SCALE: 1"=50'-0"

CONCEPTUAL - NOT FOR CONSTRUCTION



JERICHO CENTRAL SCHOOL DISTRICT
Charging Equipment Layout - Phase 2

Proj. No. 636501
Date 04/03/2025
Drawing Number **E2**

Phase 3

- Charger Quantity
 - 24kW - 7
 - 60kW - 1
- Phase 3 Charger Quantity - 8
- Total Quantity after Phase 3 - 19
- Phase 3 Charging Infrastructure Cost
 - \$1,064,000



CHARGER QUANTITY

PHASE	CHARGER TYPE	QUANTITY
PHASE 1	24kW PLUG-IN	8
	60kW PLUG-IN	-
	120kW PLUG-IN (# OF DISP.)	-
	180kW PLUG-IN	-
PHASE 2	24kW PLUG-IN	4
	60kW PLUG-IN	-
	120kW PLUG-IN (# OF DISP.)	1(2)
	180kW PLUG-IN	-
PHASE 3	24kW PLUG-IN	7
	60kW PLUG-IN	1
	120kW PLUG-IN (# OF DISP.)	-
	180kW PLUG-IN	-
TOTAL AFTER PHASE 3		19

CHARGER FEEDERS

- 60A UNDERGROUND FEEDER, FOR EACH 14.4kW CHARGER
- 50A UNDERGROUND FEEDER, FOR EACH 24kW CHARGER
- 100A UNDERGROUND FEEDER, FOR EACH 60kW CHARGER
- 200A UNDERGROUND FEEDER, FOR EACH 120kW CHARGER
- 300A UNDERGROUND FEEDER, FOR EACH 180kW CHARGER

① SITE PLAN LAYOUT - PHASE 3 (2033-2035)
SCALE: 1"=50'-0"

CONCEPTUAL - NOT FOR CONSTRUCTION



<p>JERICHO CENTRAL SCHOOL DISTRICT Charging Equipment Layout - Phase 3</p>	Proj. No.	636501
	Date	04/03/2025
	Drawing Number	E3

Grants and Incentives – Buses

State: New York School Bus Incentive Program – School Bus Voucher

School Bus Type Base	Base Voucher	Priority District Bonus	Scrappage Bonus	Wheelchair Add-on
New Type A	\$114,000	\$28,500	\$47,500	\$8,000
New Type C	\$147,000	\$36,750	\$61,250	\$8,000
New Type D	\$156,000	\$39,000	\$65,000	\$8,000
Repowered A	\$105,000	\$21,000	N/A	N/A
Repowered C	\$135,000	\$27,000	N/A	N/A

- Jericho UFSD is eligible for the above referenced funding on the first 10 electric buses purchased.

Grants and Incentives – Chargers

State: New York School Bus Incentive Program – Charging Voucher

Type	Base Voucher Amount per Bus	Fleet Electrification Plan Bonus per Bus
Non-Priority District	\$25,000	\$55,000
Priority District	\$35,000	\$65,000

Federal: Inflation Reduction Act Funding Alternative fuel vehicle refueling property credit (30c) - Expires Jun 2026

- 30% (up to \$100,000 per property item) for alternative fuel charging stations

Implementation Economics

Jericho - Battery Electric Bus Implementation Economics										
	# Of Buses or Chargers	Phase 1 (2027-2028)	# Of Buses or Chargers	Phase 2A (2029-2030)	# Of Buses or Chargers	Phase 2B (2029-2030)	# Of Buses or Chargers	Phase 3 (2031-2032)	Total Buses or Chargers	Total Project
Charging Infrastructure Cost	6	\$1,427,549.44	4	\$460,376.14	1	\$85,000.00	8	\$1,063,540.36	19	\$3,036,465.95
Utility Cost		\$38,999.44		\$0.00		\$0.00		\$0.00		\$38,999.44
Estimated State Aid Impact	20%	-\$288,910.13	20%	-\$90,694.10	20%	-\$16,745.00	20%	-\$209,517.45		-\$605,866.68
<i>Inclusive Funding Programs</i>										
NYSBIP - Charger Voucher	6	\$330,000.00	4	\$220,000.00	1	\$55,000.00	8	\$440,000.00	19	\$1,045,000.00
PSEG Make Ready Program	20%	\$200,000.00	20%	\$54,468.73	20%	\$0.00	20%	\$166,859.51		\$421,328.24
Total Charging Infrastructure Cost		\$647,638.75		\$95,213.31		\$13,255.00		\$247,163.40		\$1,003,270.47
Fire Protection Infrastructure Cost		\$1,565,487.67		\$0.00		\$0.00		\$0.00		\$1,565,487.67
Estimated State Aid Impact	10%	\$154,983.28	10%	\$0.00	10%	\$0.00	10%	\$0.00		\$154,983.28
Total Fire Protection Infrastructure Cost		\$1,410,504.39		\$0.00		\$0.00		\$0.00		\$1,410,504.39
Battery Electric Bus Cost	6	\$2,199,000.00	4	\$1,583,000.00	2	\$850,000.00	8	\$2,907,000.00	20	\$7,539,000.00
Estimated State Aid Impact	20%	-\$433,203.00	20%	-\$311,851.00	20%	-\$167,450.00	20%	-\$572,679.00		-\$1,485,183.00
<i>Inclusive Funding Programs</i>										
NYSBIP - Bus Voucher	6	\$1,109,250.00	4	\$786,250.00	0	\$0.00	0	\$0.00	10	\$1,895,500.00
Total Battery Electric Bus Cost		\$656,547.00		\$484,899.00		\$682,550.00		\$2,334,321.00		\$4,158,317.00
Comparison to estimated Diesel Bus Cost	6	\$885,000.00	4	\$615,000.00	2	\$320,000.00	8	\$1,155,000.00	20	\$2,975,000.00
Estimated State Aid Impact	20%	-\$174,345.00	20%	-\$121,155.00	20%	-\$63,040.00	20%	-\$227,535.00		-\$586,075.00
Total Diesel Bus Cost		\$710,655.00		\$493,845.00		\$256,960.00		\$927,465.00		\$2,388,925.00
Total Project Cost (WITHOUT Incentives)		\$4,663,906.71		\$1,640,831.04		\$750,805.00		\$3,188,343.91		\$10,243,886.66
Total Project Cost (WITH Incentives)		\$2,714,690.15		\$580,112.31		\$695,805.00		\$2,581,484.40		\$6,572,091.86



Next Steps

Phase 1 Design (6 Chargers and 6 Buses)





QUESTIONS?



DISCUSSIONS