



Coordinated Statewide Zero Emissions Initiatives



CTAA EXPO Workshop
5/22/2023



While we wait to start,
please fill out this poll.

Introduction



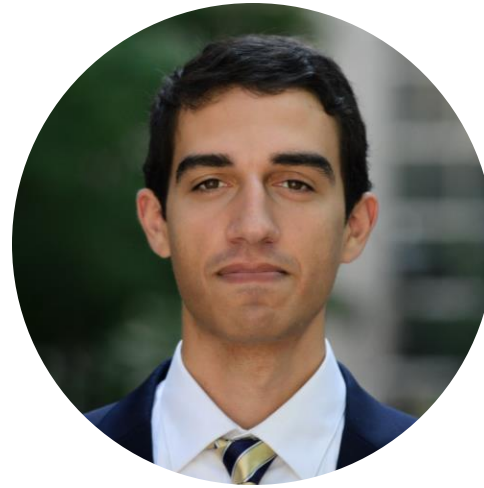
Daniel Lang, PhD

Director
*Bus and Sustainable
Transportation*



Daniel Miles, PhD

Director
Urban Solutions



Mark Perelmuter

Staff Consultant
*Bus and Sustainable
Transportation*



Elaine Hsieh

Analyst
Urban Solutions

Hatch: a History of Success

Over
100
years
in the transit
industry



Procurement,
overhaul and
integration of over
26,000+
Transit Vehicles and
associated systems

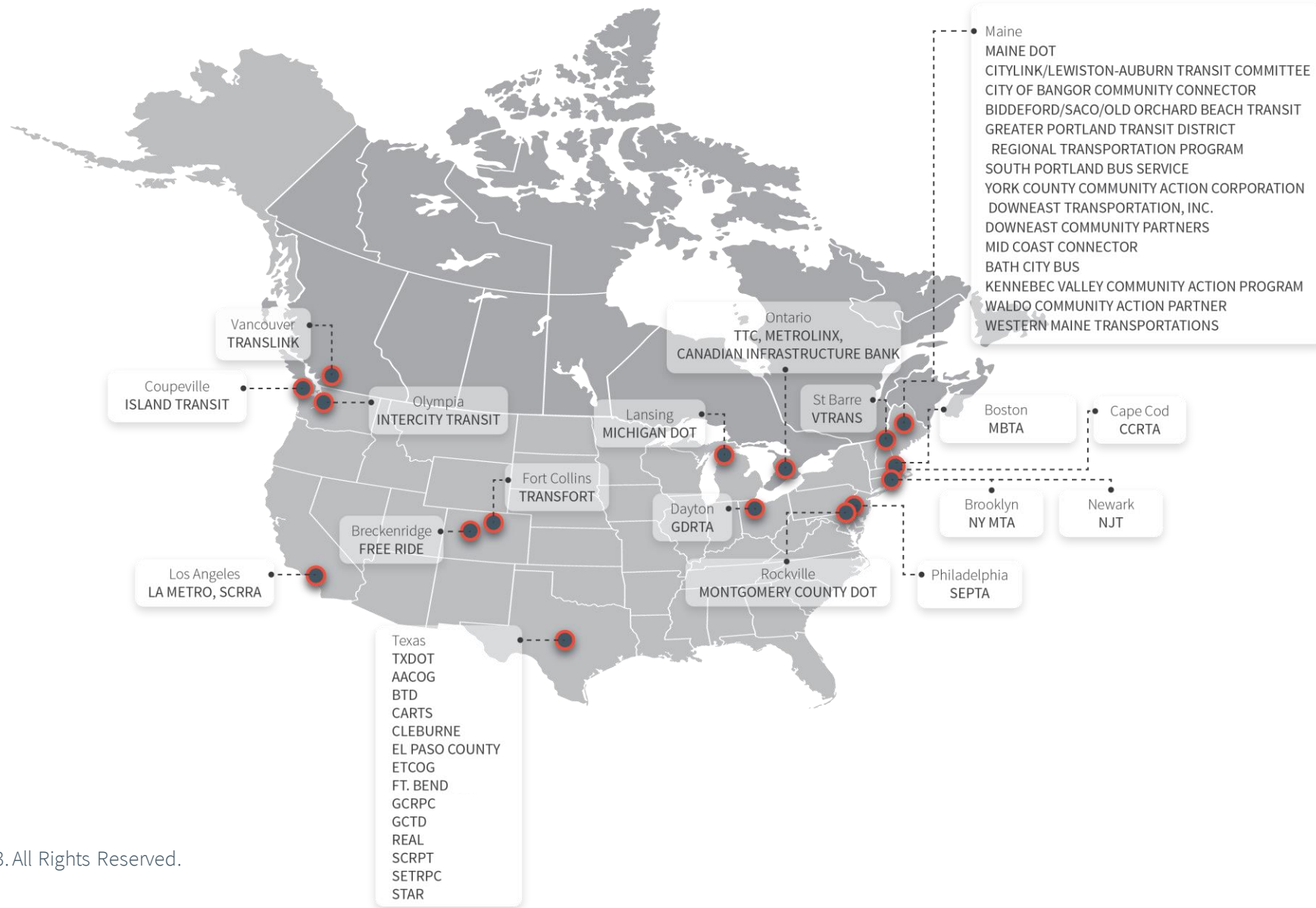


with
10,000+
global employees



We
Never
Work for
suppliers or bus
builders

Our Bus and Sustainable Transportation Experience



Agenda

- Benefits
- Case Studies
- Funding
- How Hatch Can Help
- Q&A

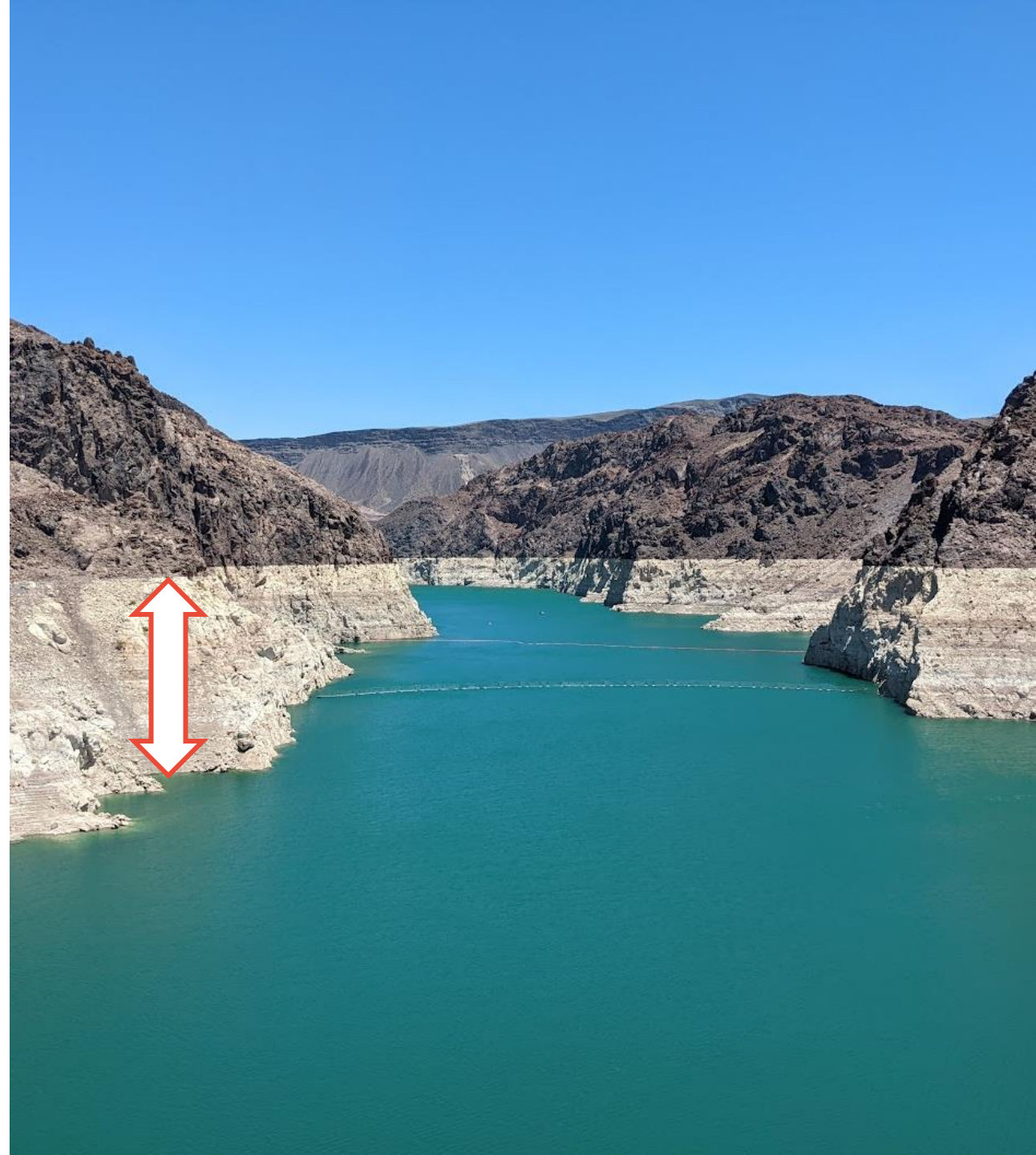


Benefits



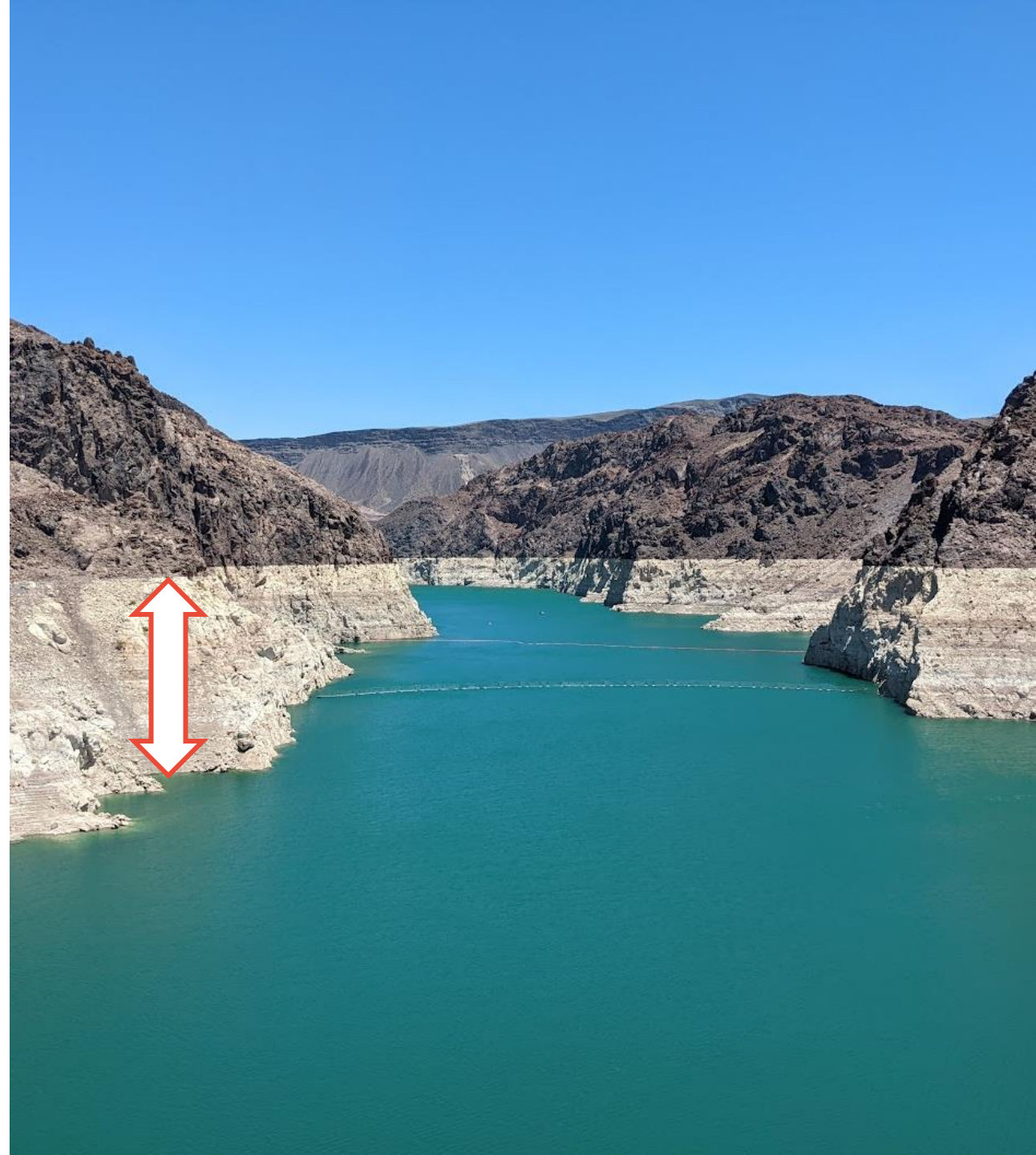
Cities and Climate Change

- **92% of North American cities cite climate change and pollution as one of the biggest challenges they will face over the next 5 years**
- **98% plan to make some investment in public EV charging over the next 5 years**
- **Over the next 5 years, cities will prioritize the following actions to reduce the carbon footprint of their transportation infrastructure:**
 - 75% integrate EV charging with public transit facilities.
 - 65% partner with transportation providers to develop EV charging facilities.
 - 33% pursue microtransit options with electric vehicles



Cities and Climate Change

- 92% of North American cities cite climate change and pollution as one of the biggest challenges they will face over the next 5 years
- 98% plan to make some investment in public EV charging over the next 5 years
- **Over the next 5 years, cities will prioritize the following actions to reduce the carbon footprint of their transportation infrastructure:**
 - 75% integrate EV charging with public transit facilities.
 - 65% partner with transportation providers to develop EV charging facilities.
 - 33% pursue microtransit options with electric vehicles



Climate Change Across Maine



Landscape

Maine has already experienced eight inches of sea level rise and is expected to rise 1.5 more feet in the next 25 years and 4 more feet by 2100



Infrastructure

Sea level rise and storm surges may cut off emergency routes and access to some communities



Ecosystems

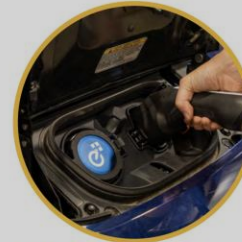
Recent “ocean heat waves” have occurred in the Gulf of Maine, warming faster than 99% of the world’s oceans

Maine Won't Wait – Climate Action Plan

1

Accelerate Maine's Transition to Electric Vehicles

- Achieve emissions-reduction goals by putting 41,000 light-duty EVs on the road in Maine by 2025 and 219,000 by 2030.
- By 2022, develop a statewide EV Roadmap to identify necessary policies, programs, and regulatory changes needed to meet the state's EV and transportation emissions-reduction goals.
- By 2022, create policies, incentives, and pilot programs to encourage the adoption of electric, hybrid, and alternative-fuel medium- and heavy-duty vehicles, public transportation, school buses, and ferries.



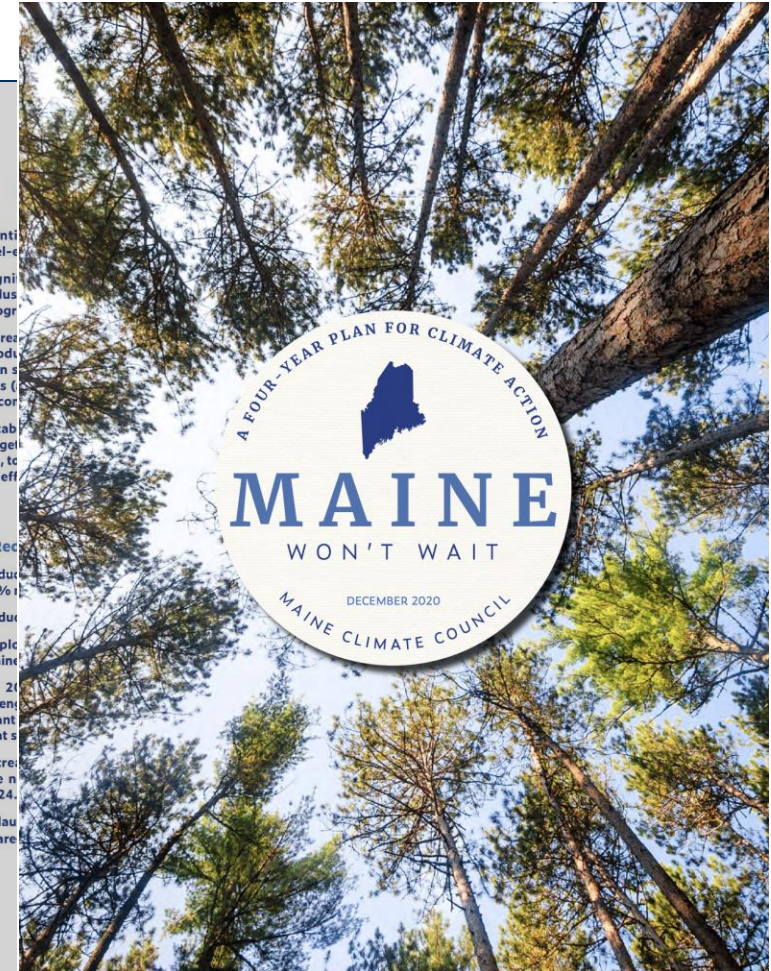
STRATEGY A Embrace the Future of Transportation in Maine

Transportation is responsible for 54% of Maine's annual greenhouse gas emissions. To meet our emissions-reductions goals by 2030 and 2050, our state must pivot to the future by pursuing aggressive transition strategies and innovative solutions within this important sector.

1

Accelerate Maine's Transition to Electric Vehicles

- Achieve emissions-reduction goals by putting 41,000 light-duty EVs on the road in Maine by 2025 and 219,000 by 2030.
- By 2022, develop a statewide EV Roadmap to identify necessary policies, programs, and regulatory changes needed to meet the state's EV and transportation emissions-reduction goals.
- By 2022, create policies, incentives, and pilot programs to encourage the adoption of electric, hybrid, and alternative-fuel medium- and heavy-duty vehicles, public transportation, school buses, and ferries.



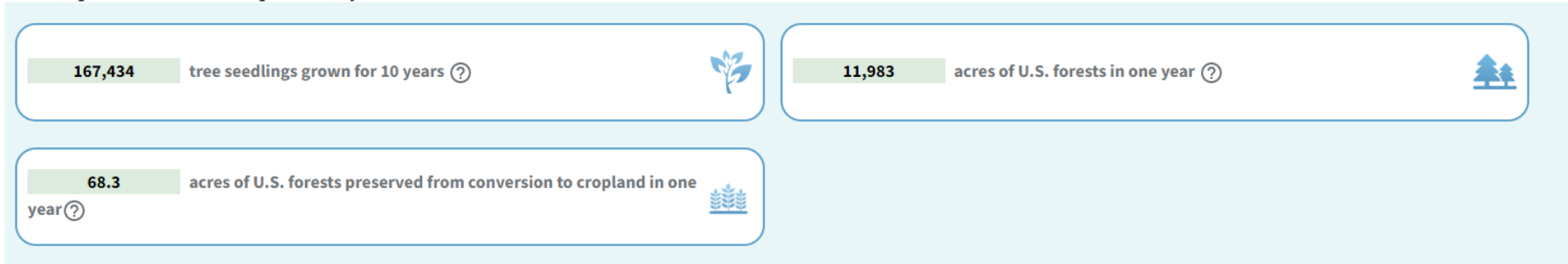
Emissions benefits of this project

- **Project We are Talking About Today:**
 - The emissions reductions from each agency would only be about **1,000 metric tons**
 - **But by working across the state the emissions reductions is over 10,000 metric tons**






This is equivalent to greenhouse gas emissions avoided by:



This is equivalent to carbon sequestered by:



Benefits

- Vehicle procurement efficiency and overhead cost reduction 
- Shared charging infrastructure 
- Knowledge sharing 
- Resiliency 
- Alignment with state and federal goals 



Vehicle procurement efficiency and overhead cost reduction

- Administration/procurement cost
 - Specification/contract development
 - Contract oversight
 - Vendor discounts for larger orders
 - 0.63% per vehicle in order
 - Vendor maintenance contract
- Manufacturing timeline
 - Production line slot



Shared Charging Infrastructure



- Lower cost of entry for agencies
- More chargers at one location for schedule “pulses”
- Low-cost charging at outer terminals



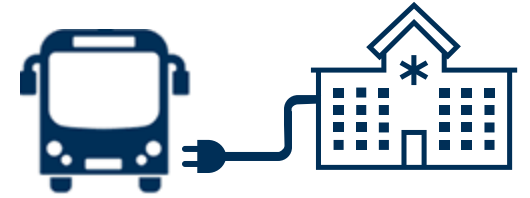
Knowledge Sharing



- Vendor technical support
 - Two agencies: save \$100k+
 - Five agencies: save \$200k+
- Maintenance and operator best practices
- Experience with broad range of technologies and vendors



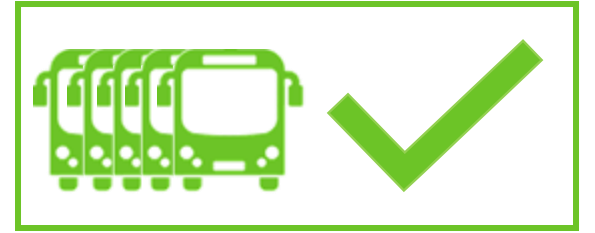
Resiliency



- Easier to borrow fleets from nearby agencies
 - Breakdowns
 - Special events
- More compatible charging locations
 - Power outages
- Using vehicles for backup building power
 - Emergency facilities



Alignment with State & Federal Goals

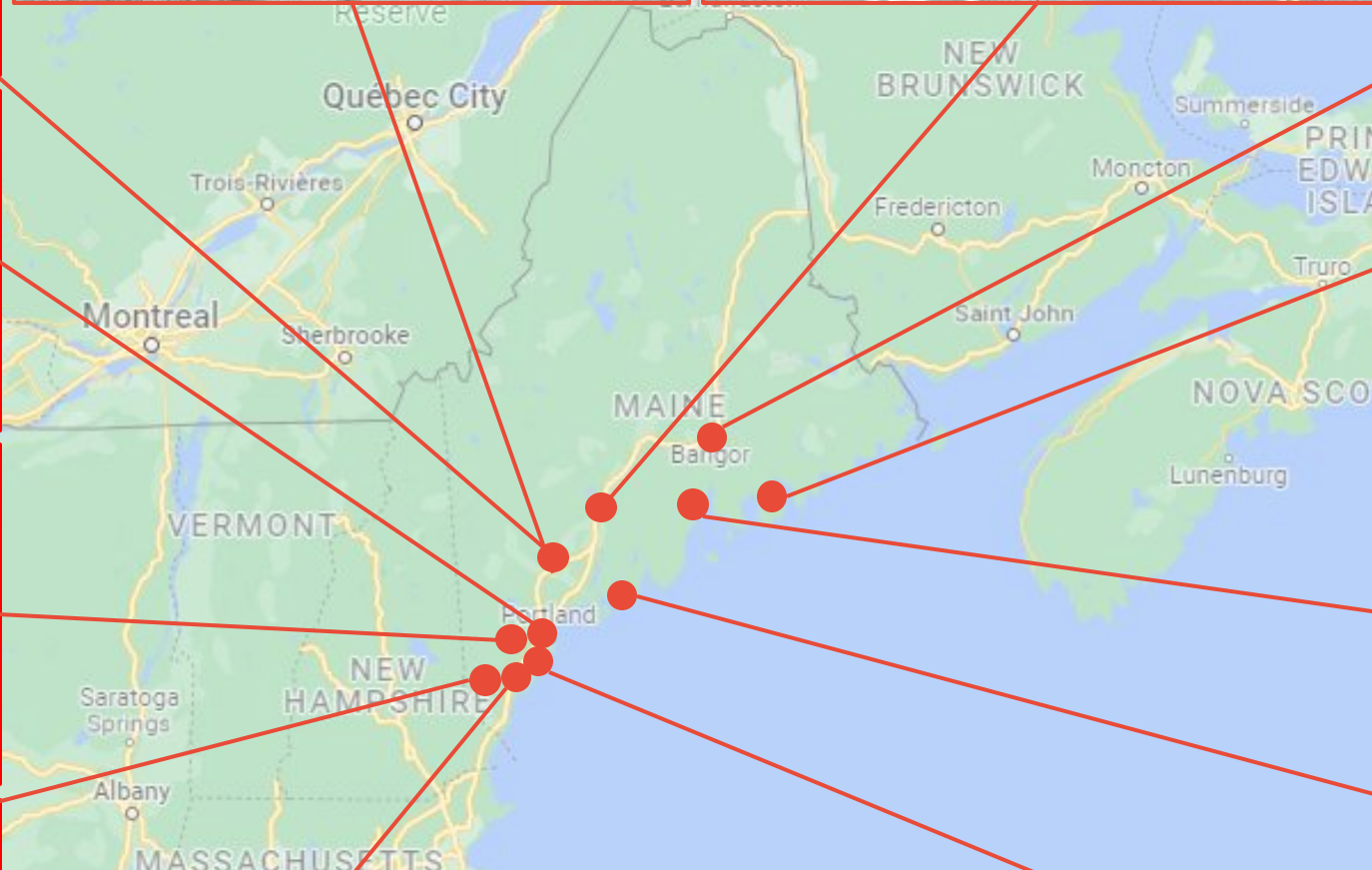


- Statewide climate goals
 - CA: 100% ZEB transit by 2040
 - 15 states+DC: 100% ZE heavy-duty vehicle sales by 2050
- FTA goals
 - Procurement Methods to Reduce Customization: encourage joint orders
 - Consolidated proposals (required for rural areas)
- Statewide cost savings
 - Can be reallocated for more vehicles or to more agencies

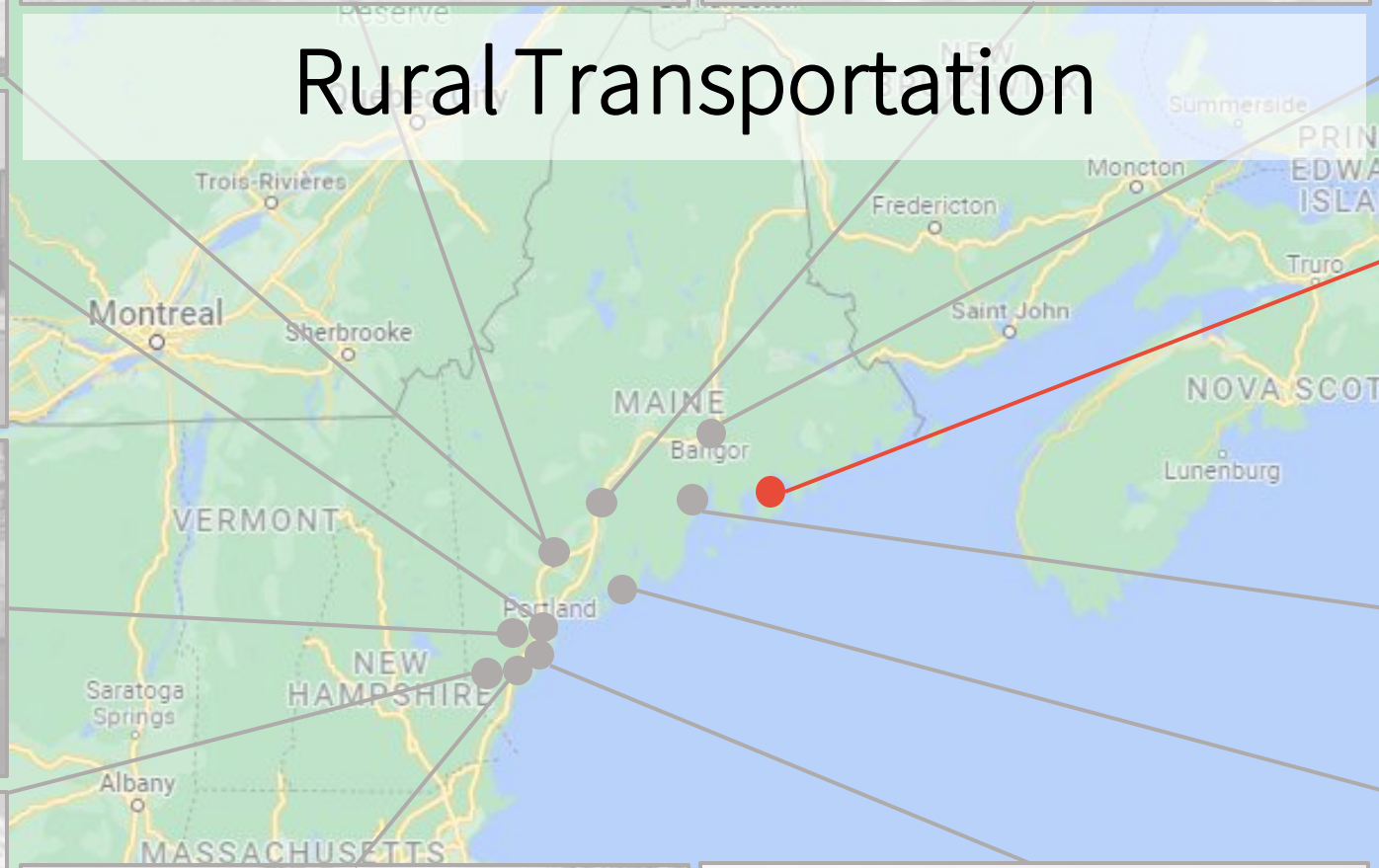




Case Studies

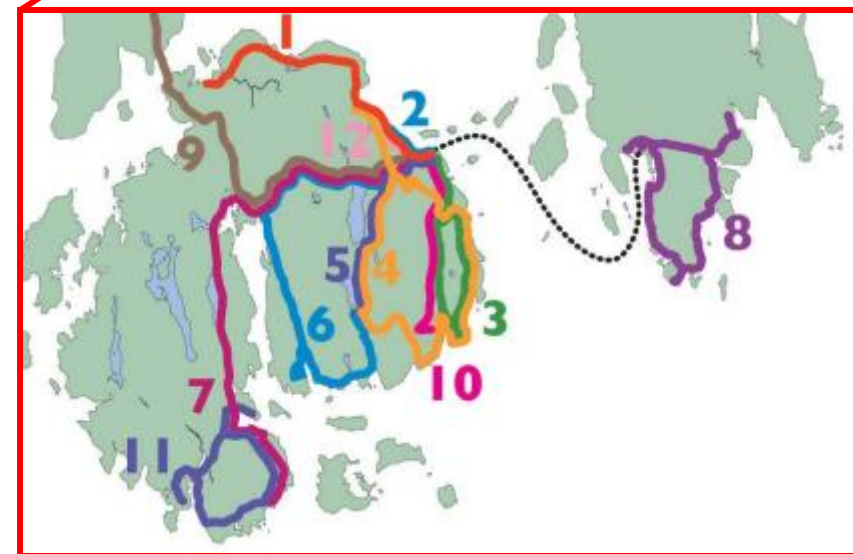
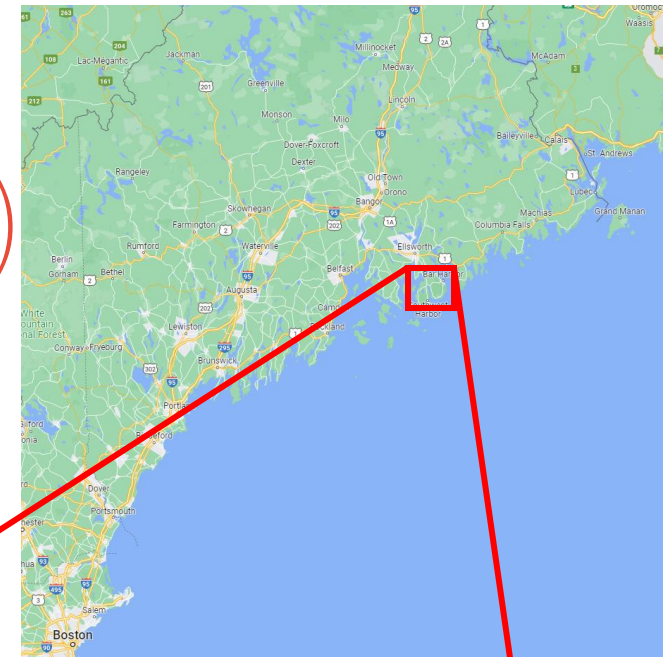


Rural Transportation



Rural Transportation: Downeast Transportation Inc (DTI)

- Service area:
 - Acadia National Park
 - Hancock County, Maine
- Routes: 27
 - Seasonal service in the National Park
 - Year-round rural circulator
 - Year-round commuter
- Fleet: 69
 - Vans, cutaways, 32', 40' buses
 - Gasoline, diesel, propane



Rural Transportation: Vehicle Procurements

- Procurements for small standalone fleets
 - Bicycle Express service – vans
 - Statewide van order identified
- Pre-procurement EV test pilots
 - 2023 summer: weeklong leases from BEB vendors to test operational feasibility
 - Constraints of National Park road network
 - Organized together with National Park Service
- Admin, maintenance, vendor support savings
- Knowledge sharing and economy of scale



Rural Transportation: Infrastructure

- Charging to support long (50mi) routes
 - Bangor CC depot identified as good location
 - Makes BEB operation realistic
 - Especially important in Maine climate
- Chargers in Bar Harbor and National Park
 - Accessible to public during off-season
 - Local partnerships ease maintenance burden
 - Multiple charging areas increase resilience
- Cost savings, operational robustness



Rural Transportation: Regional Support

- Alignment with existing initiatives
 - National Park Service supports low-emissions technologies
 - Existing fleet: propane
 - Implementation support: trial EV operation and coordination with other parks
- Local stakeholder support
 - Jackson Lab: major employer/agency funder
 - Town of Bar Harbor: climate-forward
- Funding, regional consensus

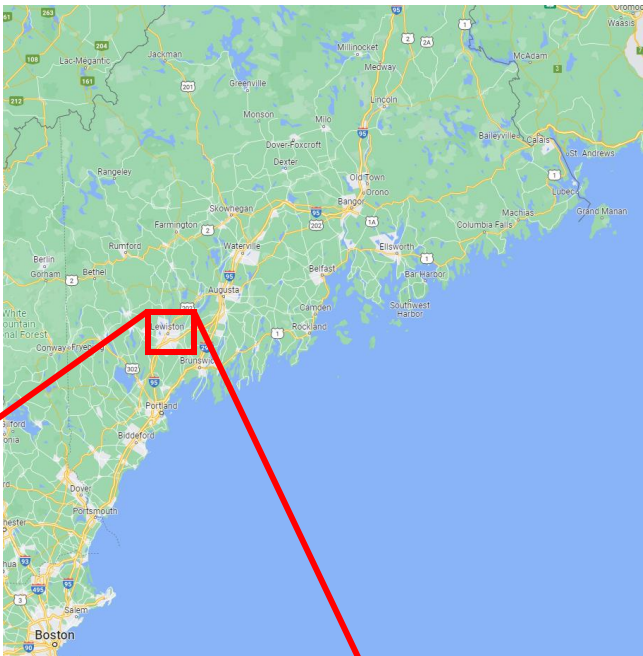


Small Urban Agency



Small Urban Agency: Lewiston-Auburn Citylink

- Service area:
 - Lewiston-Auburn, Maine
- Routes: 10
 - Urban local transit
- Fleet: 9
 - 29', 35' buses
 - Diesel
- Contracted out to private operator

A detailed map of the Lewiston-Auburn area showing bus routes. The map includes a 'Bus Index' on the left, a 'free shuttle' box, a 'citylink' logo, and a 'our fares' table. The routes are color-coded and labeled with street names like 'main street', 'college street', 'sabattus street', 'lison street', 'new auburn', 'minot avenue', and 'auburn malls'. The map also shows landmarks like 'pettengill park' and 'auburn malls'.

	REGULAR	STUDENT	SENIOR/DISABLED
Single Ride	\$2.50	\$1.25	\$1.25
Multi-Ride (5-17.50)	\$12.50	\$6.25	\$6.25
Monthly Pass	\$36	\$18	\$18

Small Urban Agency: Vehicle Procurements

- Small-agency procurement challenges
 - Two-bus initial electric fleet
 - Joint order identified with BS00B
- Learning curve for new technology
 - BS00B assisted in selecting options and configuration
 - Sharing best practices and common failures
- Reduced overhead costs, less expensive vendor support, smaller learning curve

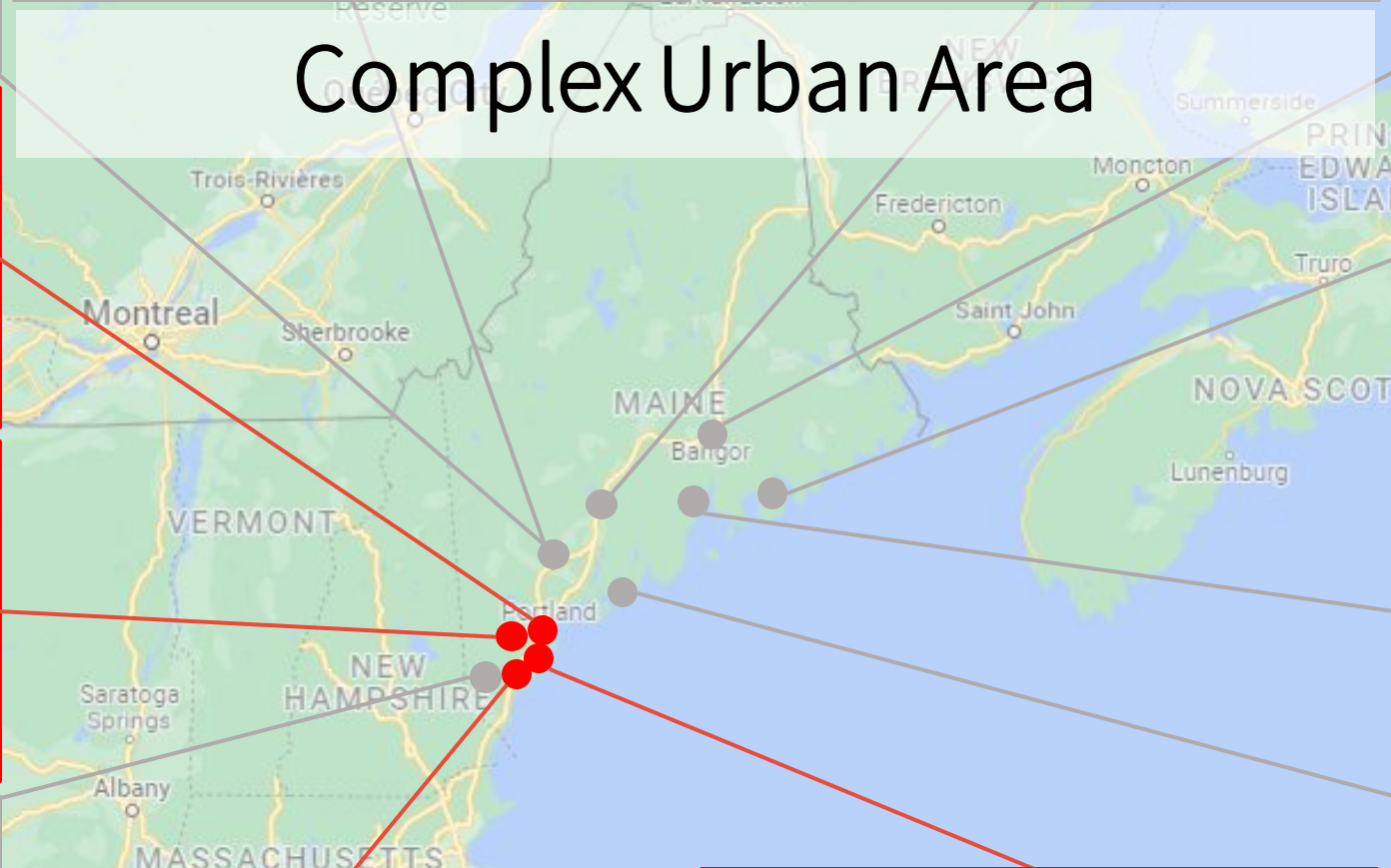


Smaller Urban Agency: Infrastructure

- Joint charger procurement
- New location needed for overnight charging
 - Depot owned by private contractor
 - City-owned lot near transit hub identified
 - City can help with security, maintenance
 - Public use of chargers during daytime
- Use by other transit providers
 - Accelerated regional electrification
- Reduced cost, implementation support

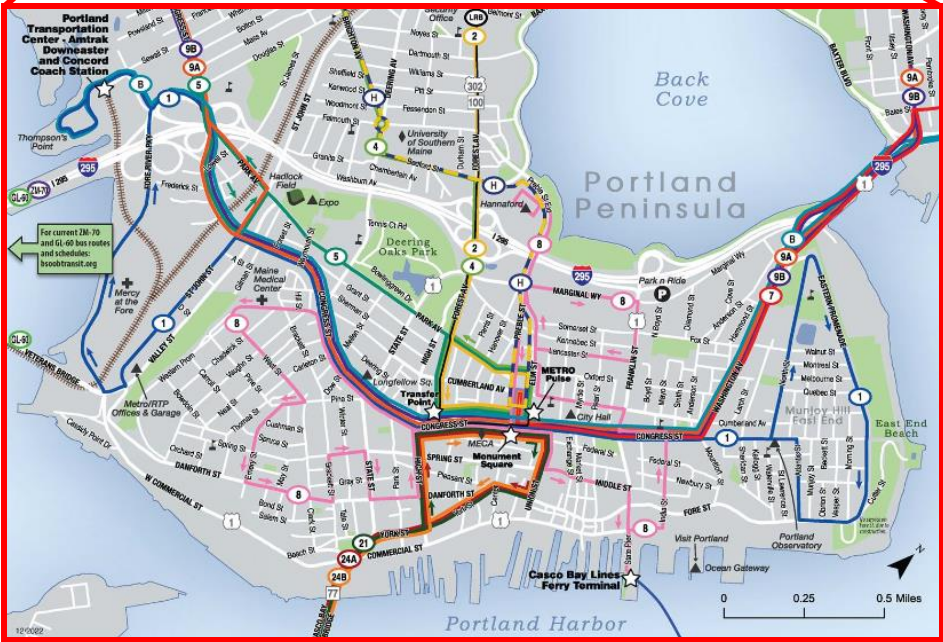
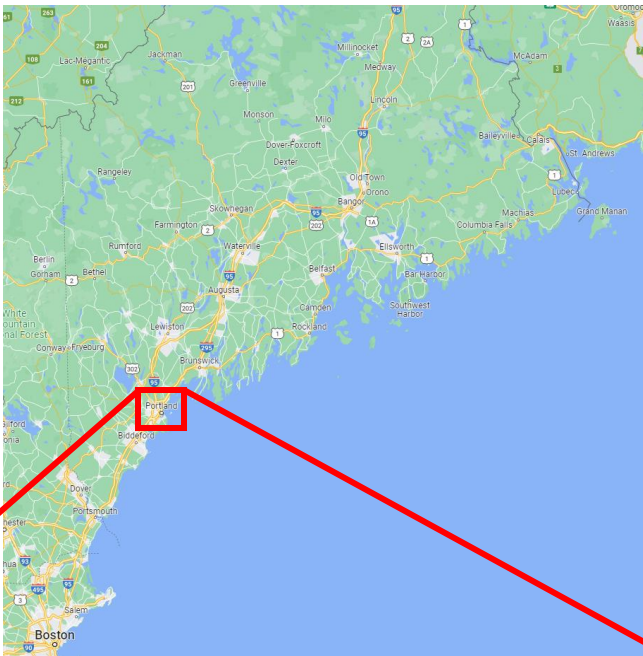


Complex Urban Area



Complex Urban Area: Portland

- Service area:
 - Portland, Maine MSA and Cumberland County
- Agencies:
 - Portland Metro
 - South Portland Bus Service
 - Biddeford-Saco-Old Orchard Beach Transit
 - Regional Transportation Program
- Routes: 24
 - Urban local transit, commuter, rural
- Fleet: 109
 - Vans, cutaways, trolleys, 35', 40' buses, coaches
 - Diesel, gasoline, CNG



Complex Urban Area: Vehicles

- Joint BEB orders (BSOOB and Metro)
 - Successfully in service for one year
 - Have yielded further orders
- Nearby community college partnership
 - EV mechanic training course
- Multi-vendor BEB experience
 - Improved knowledge base for region's agencies
- Reduced procurement and maintenance costs, development of regional EV workforce



Complex Urban Area: Shared Infrastructure

- Multiple agencies serve downtown hubs
 - Identification of joint terminal locations
 - Discussions for joint charger placement
 - Varied vehicle types → varied charger types
- Reduced procurement and maintenance cost
- Improved passenger experience
 - Transit hub development
 - Route connectivity



Paratransit



Paratransit

- Service area:
 - Cumberland County and York County, Maine
- Agencies:
 - Regional Transportation Program
 - York County Community Action Program
- Fleet: 69
 - Vans, cutaways, trolleys
 - Gasoline

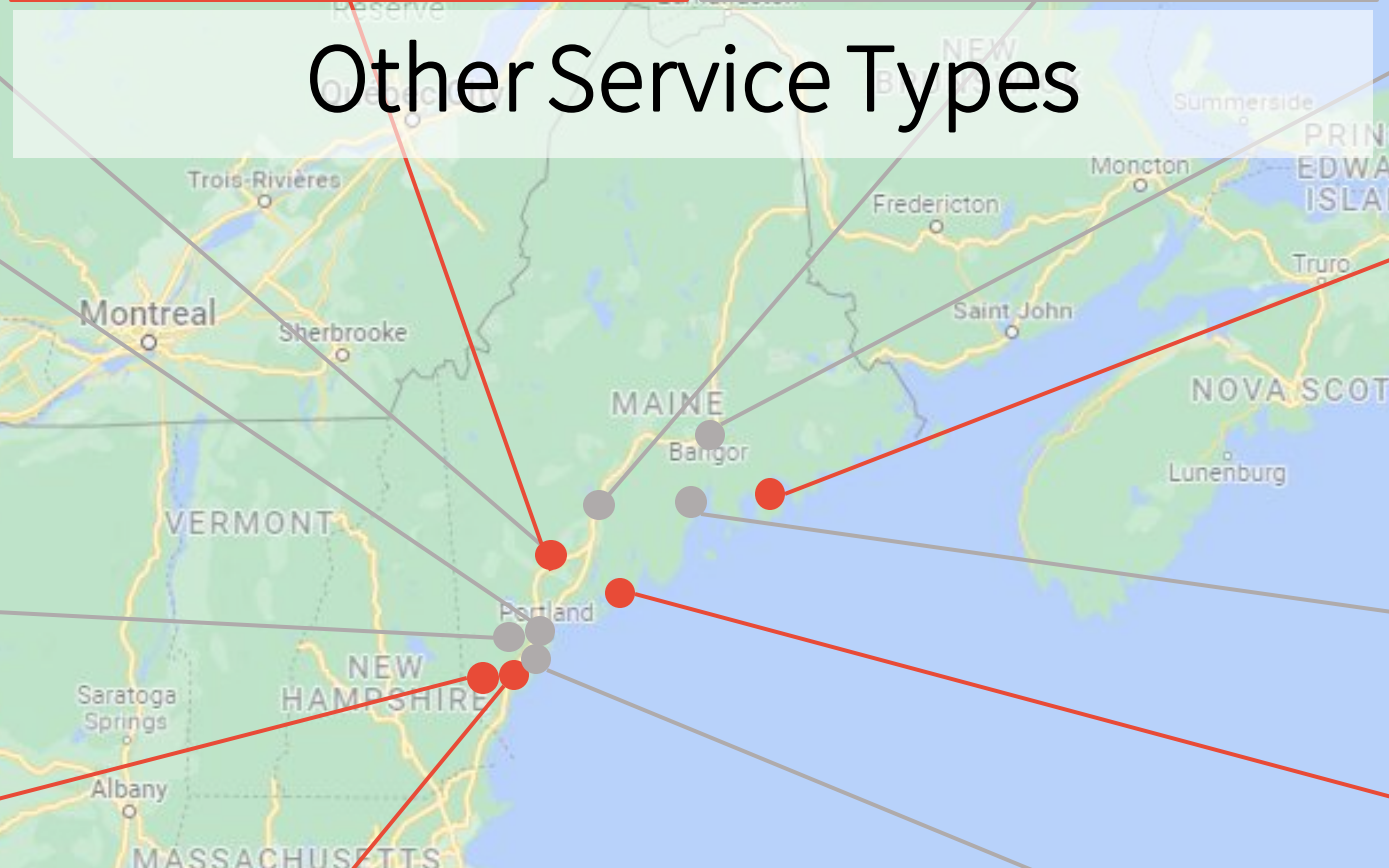


Paratransit

- Funding and supply chain challenges
 - Statewide contract opportunities identified
 - Different vehicle types considered under joint order
- Long duty cycles, high mileage
 - Use of chargers throughout service area
- Trip assignment software range awareness
 - Knowledge sharing, software procurement economy of scale
- Reduced procurement and support cost, greater economies of scale



Other Service Types



Seasonal Service

- Joint procurement for uncommon vehicle types
 - Reduce prevalence of “oddball” fleets
 - Increase knowledge sharing, vendor support capabilities
- Public use of chargers for off-season
 - Increase utility of installed infrastructure



School Buses

- Electrification of school buses
 - Short duty cycles, long periods to charge
 - 10x as many school buses as transit buses in US
- Shared charging for school buses and transit buses
 - Transit buses require overnight charging
 - School buses can charge midday and evening
 - Considered for Citylink



A white and black articulated bus is parked on a paved area in front of a modern glass building. The bus features a large graphic on its side that reads "100% BATTERY ELECTRIC" in white text, set against a background of blue and white abstract lines. The bus has a white front and roof, and a black body. The building behind it has a curved facade with large glass windows reflecting the sky and palm trees. A sign for "ANAHEIM PLAZA" is visible in the background. A semi-transparent grey box with the word "Funding" in white text is overlaid on the center of the image.

Funding

Low-no Grant

Key Benefit

Provides funding for the purchase or lease of zero-emission and low-emission transit buses, including acquisition, construction, and leasing of required supporting facilities such as recharging, refueling, and maintenance facilities

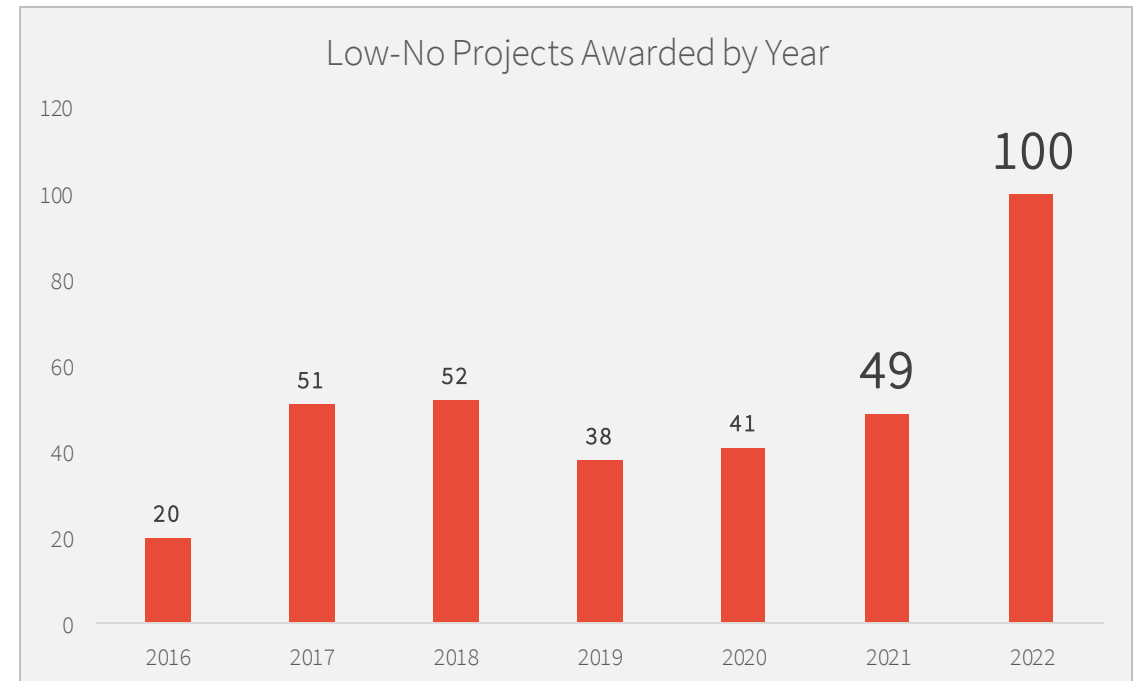


More Investment in EVs

Electrification is on the rise and funding is becoming more readily available

- **Federal funding for the Low-No Grant increased from \$55M to \$1.2B from 2016 to 2022**
- **Awarded projects have doubled in the last year (49 projects awarded in 2021 vs. 100 projects awarded in 2022)**
- **Increased government incentives and mandates towards electrification**

\$55M → **\$1.2B**
In 2016 In 2022



Low-no Joint Procurement Takeaways

- Start Early – Beginning collaboration early will expedite the application process
- It's Mandatory – Rural Agencies must apply with the State
- Pro-active work includes developing transition plans and familiarizing your agency with policies on climate change, equity, and regional and local incentives
- Application Tips:
 - Attend Early Webinars
 - NOFO is your guide, but changes year by year
 - Have clear communication with agencies involved
 - Consider scalable options

Low-no Grants Recipients



Wisconsin DOT

Received \$1,500,000 in 2018

Rural fleets statewide

EVs

charging

electrical



Colorado DOT

Received \$1,450,000 in 2017

**Town of Vail, Roaring Fork
Transportation Authority, City of
Boulder**

EVs



Iowa DOT

Received \$2,784,940 in 2021

**East Central Iowa Council of
Governments, Heart of Iowa
Regional Transit Agency, Southeast
Iowa Bus Regional Transit Agencies**

charging

facility

Additional Funding Opportunities



Bus and Bus Facilities / 5339B

Supports state and local efforts to buy or modernize buses, improve bus facilities, and support workforce development



Rebuilding American Infrastructure with Sustainability and Equity (RAISE)

Provides funding for critical freight and passenger transportation infrastructure projects



National Electric Vehicle (NEVI) Infrastructure Formula Program

Funding to States to deploy EV charging infrastructure; To establish an interconnected network to facilitate data collection, access, and reliability

Additional Funding Opportunities

National Highway Performance Program (NHPP)

\$28.4B

National Electric Vehicle (NEVI) Formula Program

\$685M

Advanced Transportation and Technologies and Innovative Mobility Deployment

\$60M

Surface Transportation Block Grant Program (STBG)

\$12.5B

Rebuilding American Infrastructure with Sustainability and Equity (RAISE)

\$1.5B

Transportation Infrastructure Financing and Innovation Act (TIFIA)

\$250M

National Highway Freight Program (NHFP)

\$1.4B

Infrastructure for Rebuilding America (INFRA) Grant Program

\$1.5B

Discretionary Grant Program for Charging and Fueling Infrastructure

\$300M

Carbon Reduction Program

\$1.2B

Rural Surface Transportation Grant Program

\$300M

Territorial Highway Program (THP)

\$46M

Projects

Cape Cod Airport Microgrid Project

- MassDOT Aeronautics Division has received a \$2M SMART grant award to be used to support the planning of a smart microgrid that generates and distributes clean, reliable power at Cape Cod Gateway Airport in Hyannis
- This project was done in collaborate with Cape Cod Gateway Airport and Cape Cod Regional Transit Authority
- CCRTA has set a goal of operating 100% zero-emission transit vehicles by 2030



Projects

Florida DOT awarded \$85.8M in funding

- Awarded \$85.8M in 2022 from the RAISE Grant to support 5 projects to help move forward on projects that modernize roads, bridges, transit, rail, ports, and intermodal transportation*

- Clearwater Multimodal Transit Center
- New Berth 301
- PortMiami Net Zero Program: Cargo Mobility Optimization and Resiliency Project
- East Coast Corridor Trespassing and Intrusion Mitigation Project
- SMART St. Augustine



Projects

AC Transit Hydrogen Fueling Station

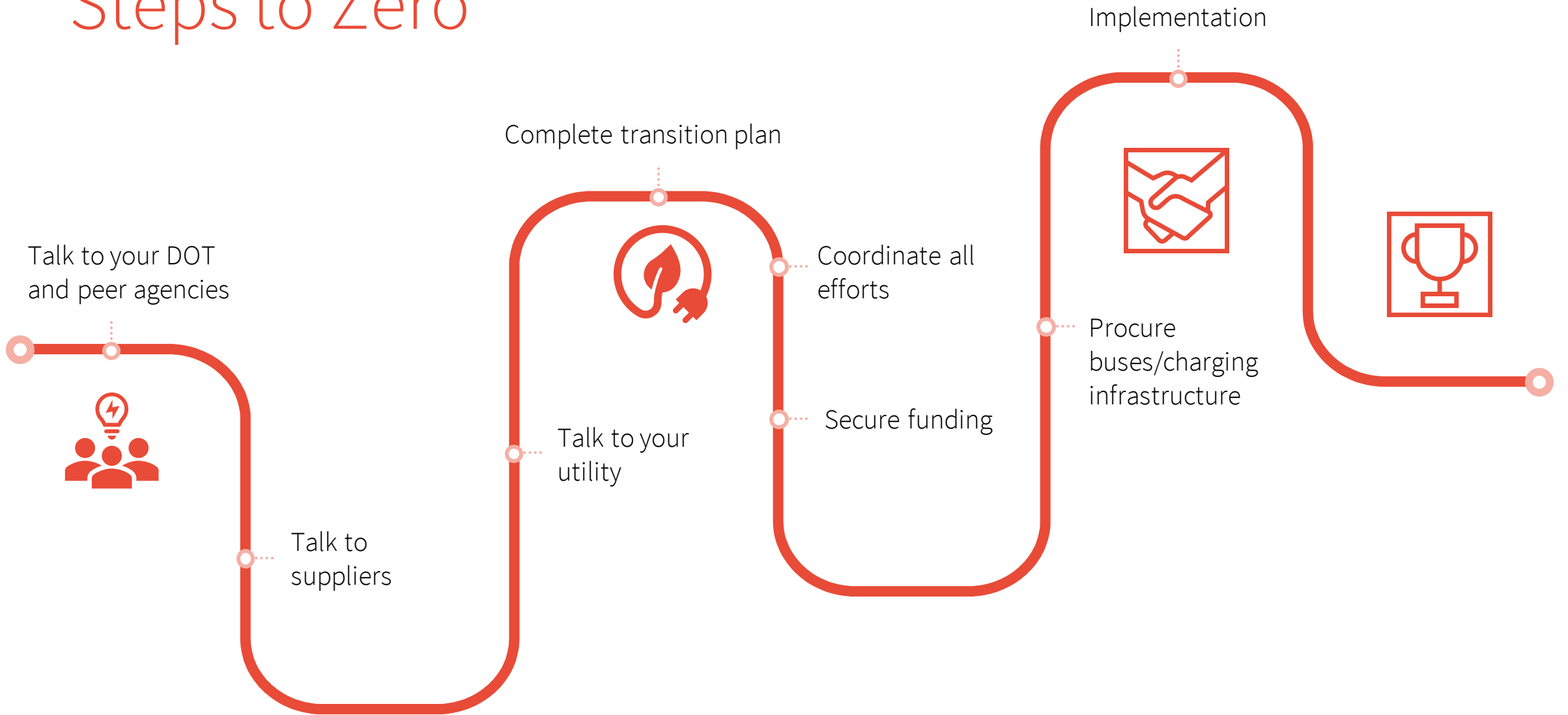
- AC Transit in California has been building their most comprehensive ZEB Program that has expanded from hydrogen fuel-cell electric buses to battery electric buses
- In 2014, a hydrogen fueling station was built which has the capabilities of fueling 13 buses back-to-back and 5 depot DC-fast charging stations which can provide a maximum output of 125kW per charging station



A blue electric bus is parked in a charging station. The bus has a sign on the front that says "it's ELECTRIC!" with a green arrow pointing right. The bus is positioned between charging stations. The scene is lit with overhead lights.

How Hatch Can Help

Steps to Zero



We Can Help

Bus and Sustainable Transportation

- Transition plans
- Route Planning
- Vehicle Technology Assessments
- Depot and Infrastructure Assessments
- Electrical Utility Analyses
- Resiliency Planning
- Lifecycle Costing
- Emissions Estimates
- Consideration of Joint Procurement



Urban Solutions

- Help secure funding
 - Grant application project management and writing
 - Benefit-Cost Analysis
- Equity/Justice 40 analysis
- Socio-economic and demographic analysis
- Impact analysis

Poll Results

Questions?

