



AMERICAN
PUBLIC
TRANSPORTATION
ASSOCIATION

Transit Agency and Utility Partnerships: Case Studies from Denver, Minneapolis/St. Paul Metro and Portland

June 16, 2020

Welcome



Lisa Jerram

Director, Bus Programs and Emerging Vehicle Technologies

American Public Transportation Association

Washington D.C.



Kellen Schefter

Director, Electric Transportation

Edison Electric Institute

Washington D.C.

Moderators



Lisa Jerram

Director, Bus Programs and Emerging Vehicle Technologies

American Public Transportation Association

Washington D.C.



Kellen Schefter

Director, Electric Transportation

Edison Electric Institute

Washington D.C.

Panelists



Kevin Schwain

Electric Vehicle Program Lead
Xcel Energy



Carly Macias

Senior Transportation
Planner
RTD



Carrie Desmond

Principal Engineer
Metro Transit



Jeff Owen

Strategic Planning
Coordinator
TriMet

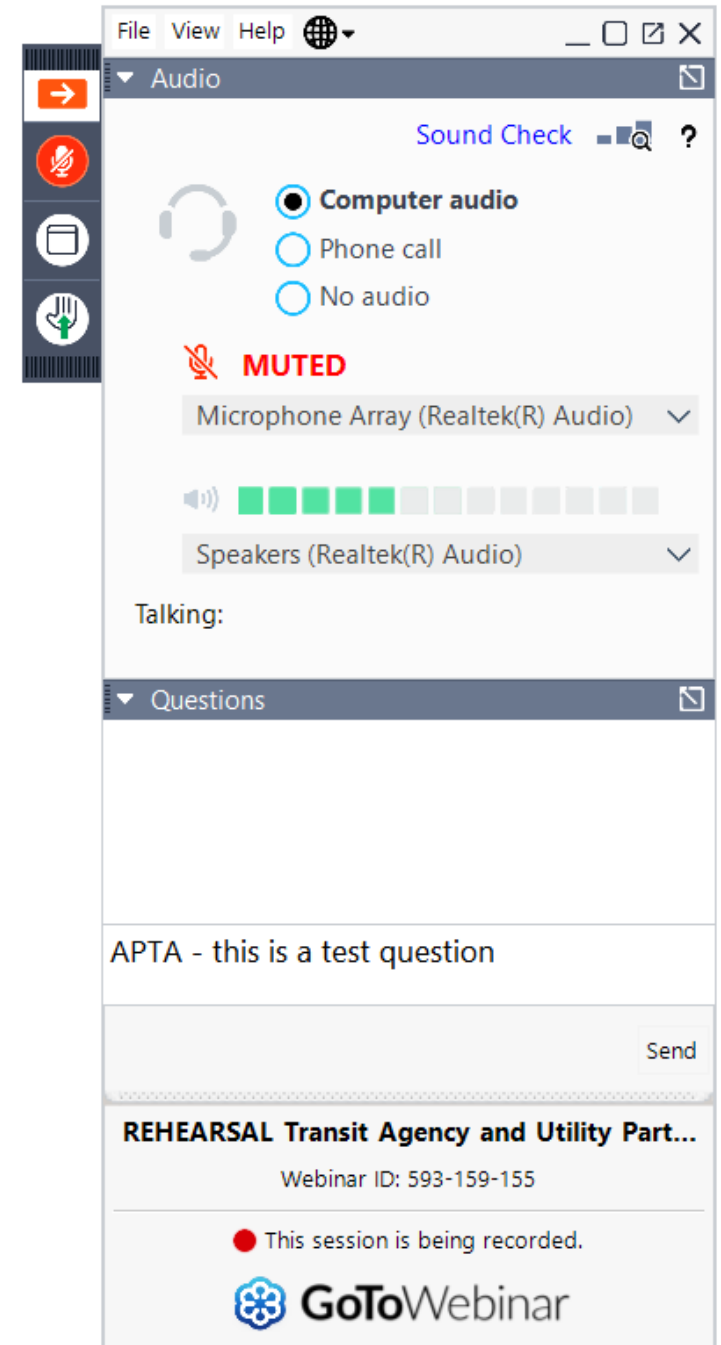


Jill King

Senior Key Customer
Manager
Portland General Electric

Audience Questions

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- Please identify your company/agency before you type your question.
- *Ex. “APTA – this is a test question”*



Panelists' Presentations

Transit Agency Partnerships

with

Electric Utility Providers



Jeff Owen, TriMet
Strategic Planning Coordinator
OwenJ@trimet.org

Jill King, Portland General Electric
Sr. Key Customer Manager
Jill.King@pgn.com

Today's Outline

- Alignment and Shared Goals
- Partnership Structure
- Public Utility Commission Filing
- Project Highlights:
 1. Battery Electric Bus Pilot
 2. Powell Bus Garage
- Future Initiatives



Alignment and Shared Goals

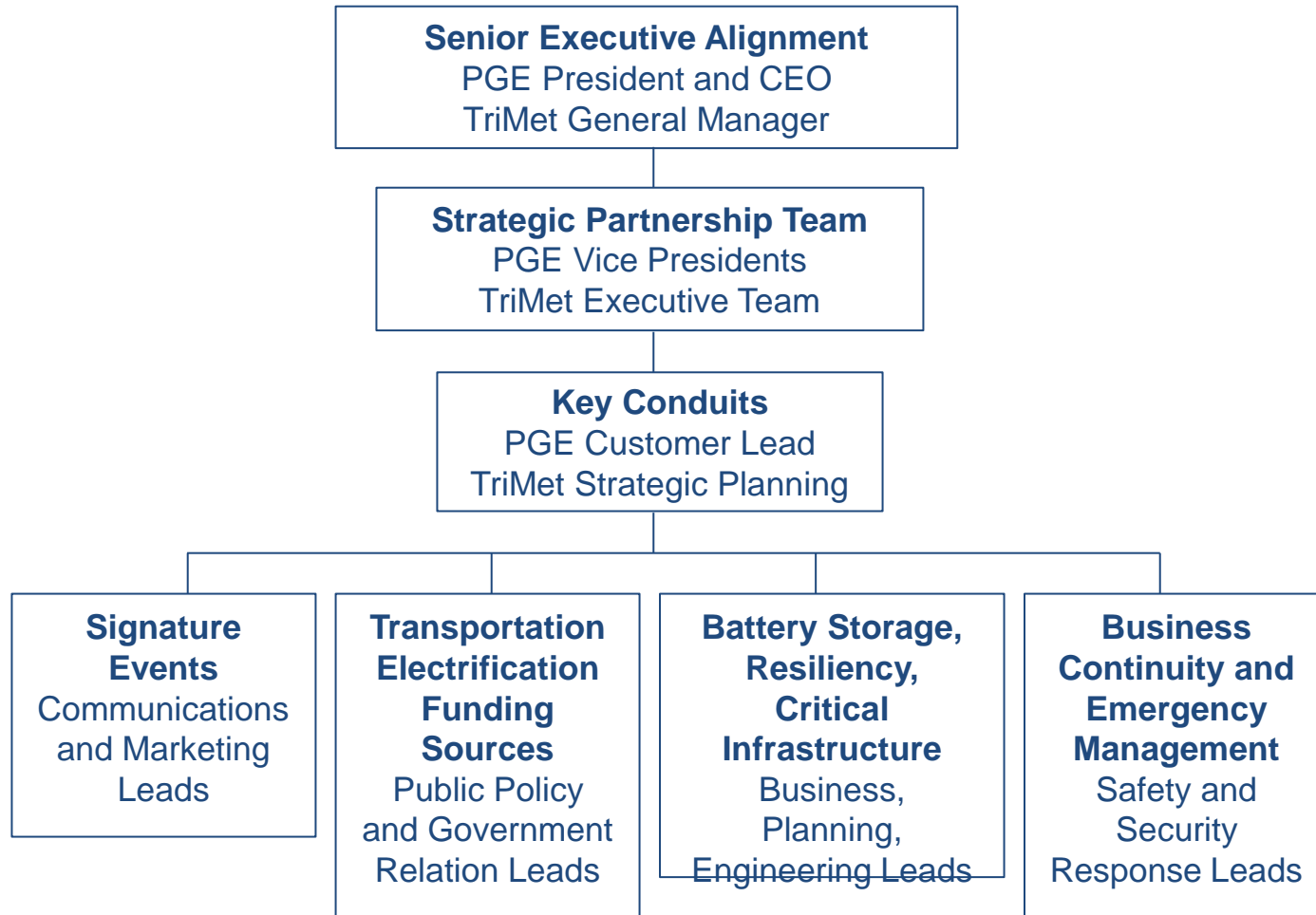
TriMet Goals:

- Transition to a clean energy bus fleet by 2040 with associated charging infrastructure
- Convert MAX light rail to clean energy
- Reduce risks of new technology
- Support state and regional goals and clean initiatives
- Deliver capital transit projects for the region and our partners

PGE Goals:

- Accelerate Oregon's legislative goals around greenhouse gas emissions with electrification of transportation
- Maintain strong regional transit partner with common environmental and community goals
- Expand PGE's ability to serve the community in adoption of transportation electrification for a more connected grid
- Efficiently integrate new electric fleet loads into the grid

Partnership Structure



City of Portland Mayor Ted Wheeler (center) with Doug Kelsey, TriMet (left) and Maria Pope, PGE (right) at the C40 World Mayors Summit, 2019

Public Utility Commission Filing

- **February 2019: UM 1811 Transportation Electrification Filing**
 - Supports business charging infrastructure and includes public transit working to electrify fleets. TriMet submitted a letter of support for the filing, along with other partners.
- **PGE TE Plan acknowledged, and Governor's Executive Order 20-4**
 - Support from Governor's Executive Order to accelerate TE to reduce GHG emissions.
- **Fleet Program in development**
 - PGE and TriMet partner through workshops to determine effective programs for transit, and explore options to offset cost and complexity of fleet planning and charging infrastructure.



Battery Electric Bus Pilot



- TriMet secured an FTA Low-No Grant with PGE support
- Beginning in April 2019, five new BEBs began service on Line 62, powered entirely by PGE's Clean Wind Program
- 26 mile route with 450 kW ABB overhead fast charger on-route and 150 kW depot chargers

"We are proud to support TriMet's work to electrify transportation across our region. Powered by wind, this all-electric bus line is a sustainable transportation option for the community and another step closer to a clean energy future for Oregon."

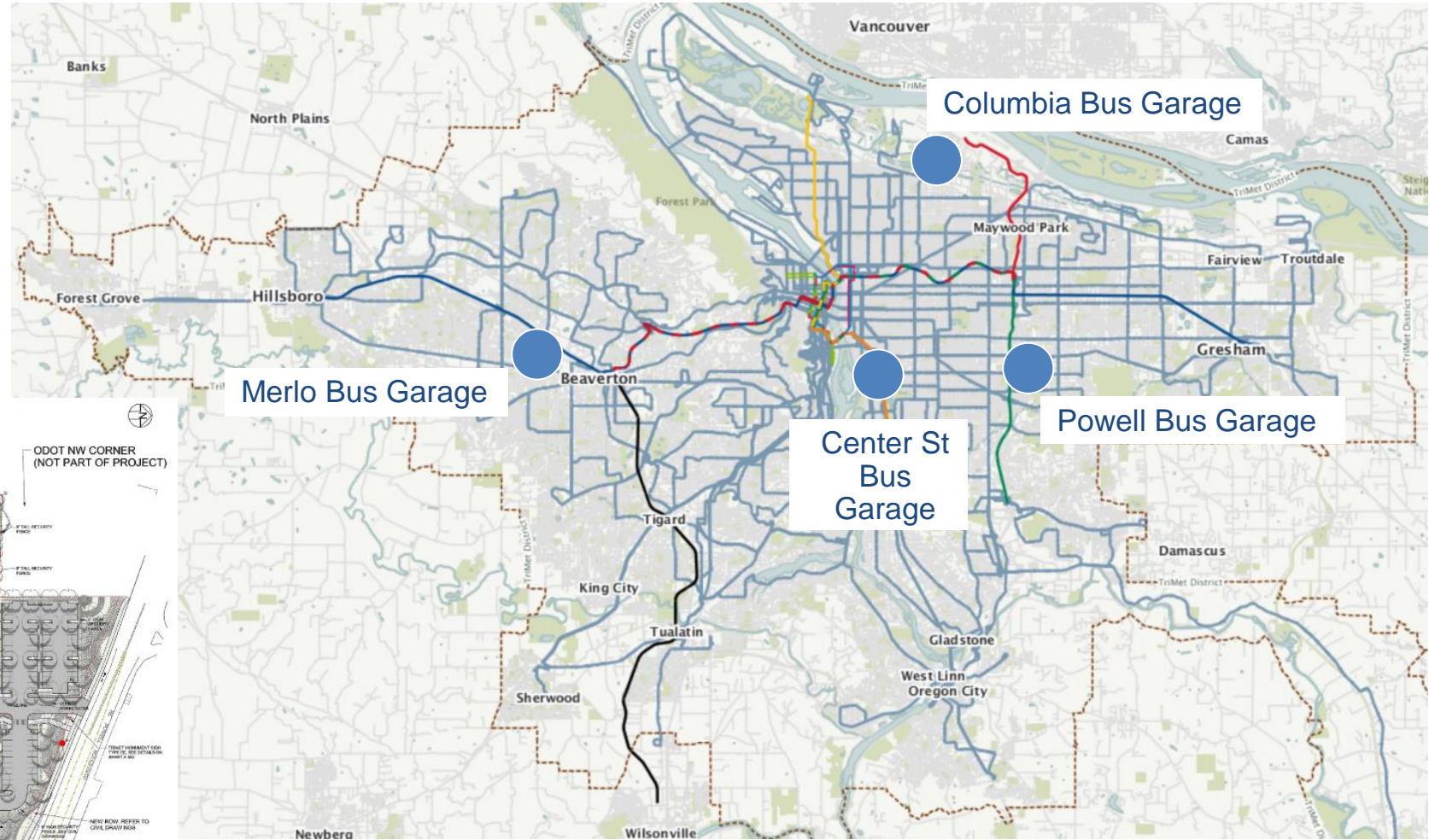
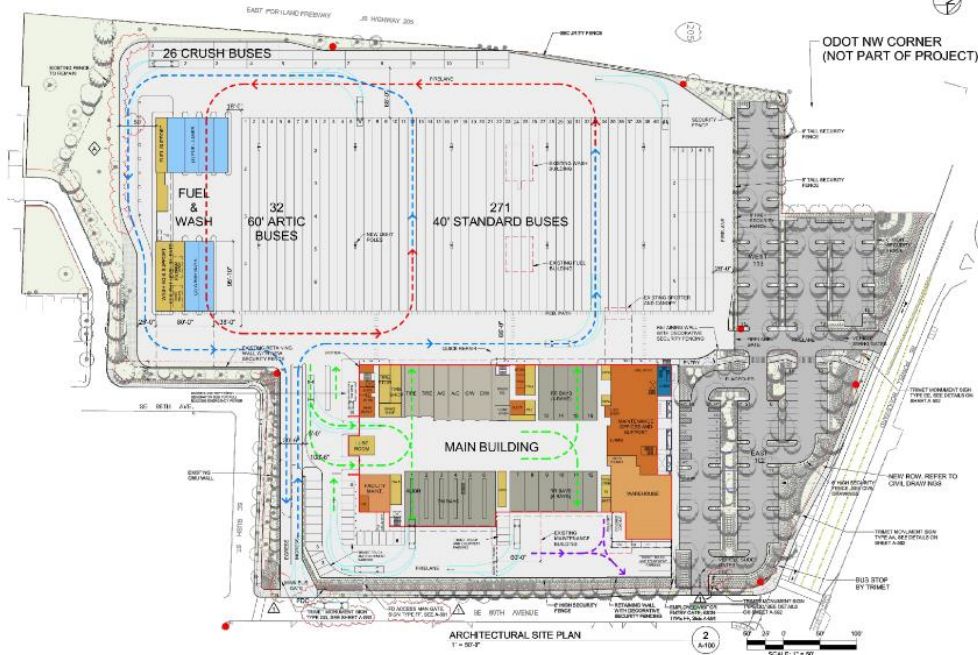
Maria Pope, PGE president and CEO

"Today, we are riding the winds of change. TriMet's commitment to a zero-emissions bus fleet by 2040 and support of wind power put the agency and our region at the forefront of a cleaner future."

Doug Kelsey, TriMet general manager

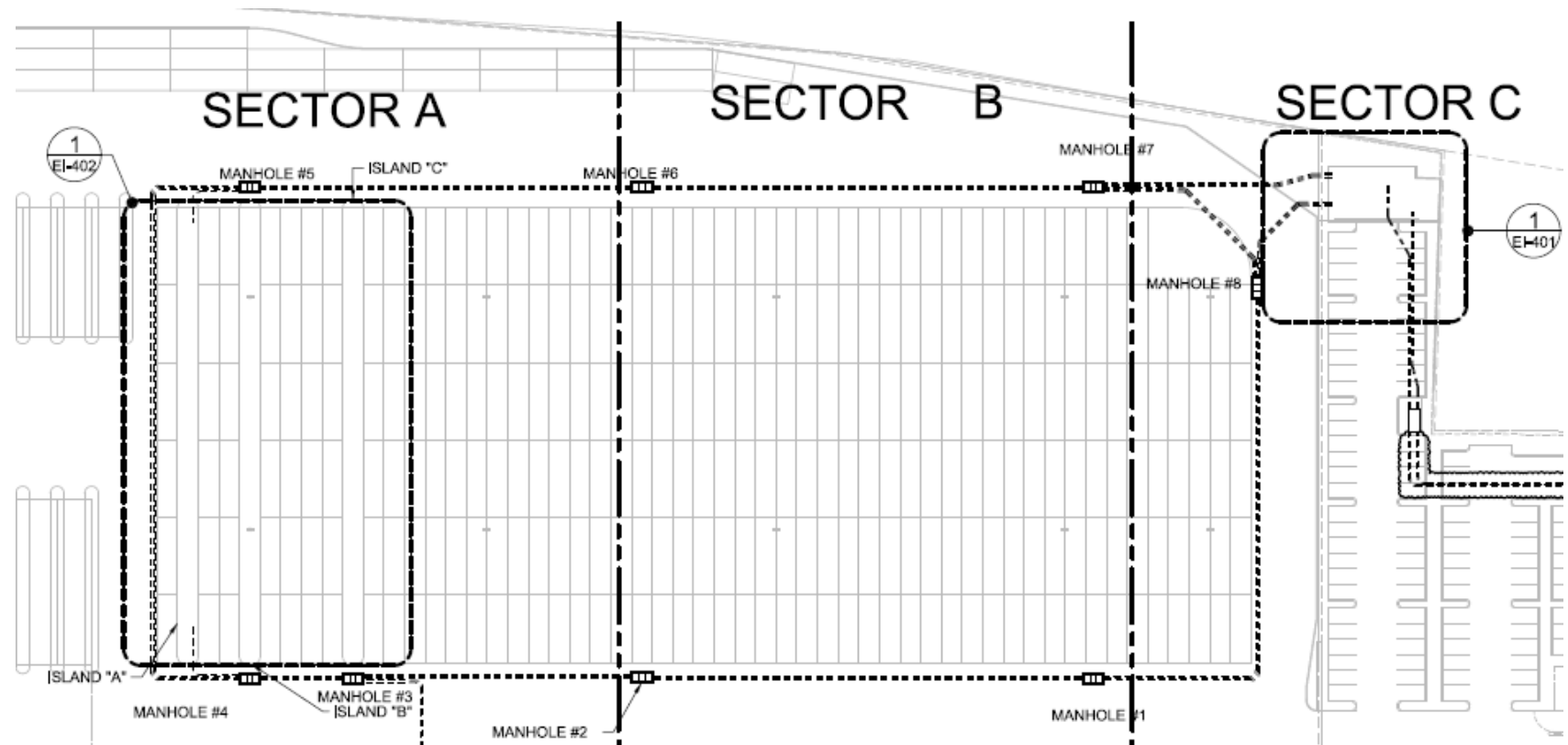
Powell Bus Garage

- TriMet is renovating and expanding Powell garage to accommodate 40' buses and new 60' articulated buses
- PGE is providing electrification expertise for charging infrastructure



Powell Bus Garage

- Key project needs for electrification include reliability, potential for expansion, and flexibility for future innovation.
- Project will install a distribution loop feed for the bus yard.
- In both Phase I & Phase II, the project will install islands with freestanding charging equipment.
- Future phases include evaluating a gantry style overhead charging system, and advanced charging management.



Advancing Innovation

- Moving forward, we plan to build upon our strong relationship and work closely together on a range of potential innovative initiatives:
 - **Connected Communities:** Battery storage, EV charging and resiliency hubs, Options at bus garages, Mobility Hub concepts, and unique community sites.
 - **Grant Applications:** Both agencies partner to expand knowledge and evaluate new technology.
 - **Partnership at Multiple Levels:** Both agencies have common goals to serve the Portland metro region and the state of Oregon, Coordinate on emergency services, and Support carbon-reduction goals.



TriMet @trimet · May 31, 2019

Meet the Starlight Parade's very special guest (thanks for making this happen, @portlandgeneral!)



Thank You!

Jeff Owen, TriMet
Strategic Planning Coordinator
OwenJ@trimet.org

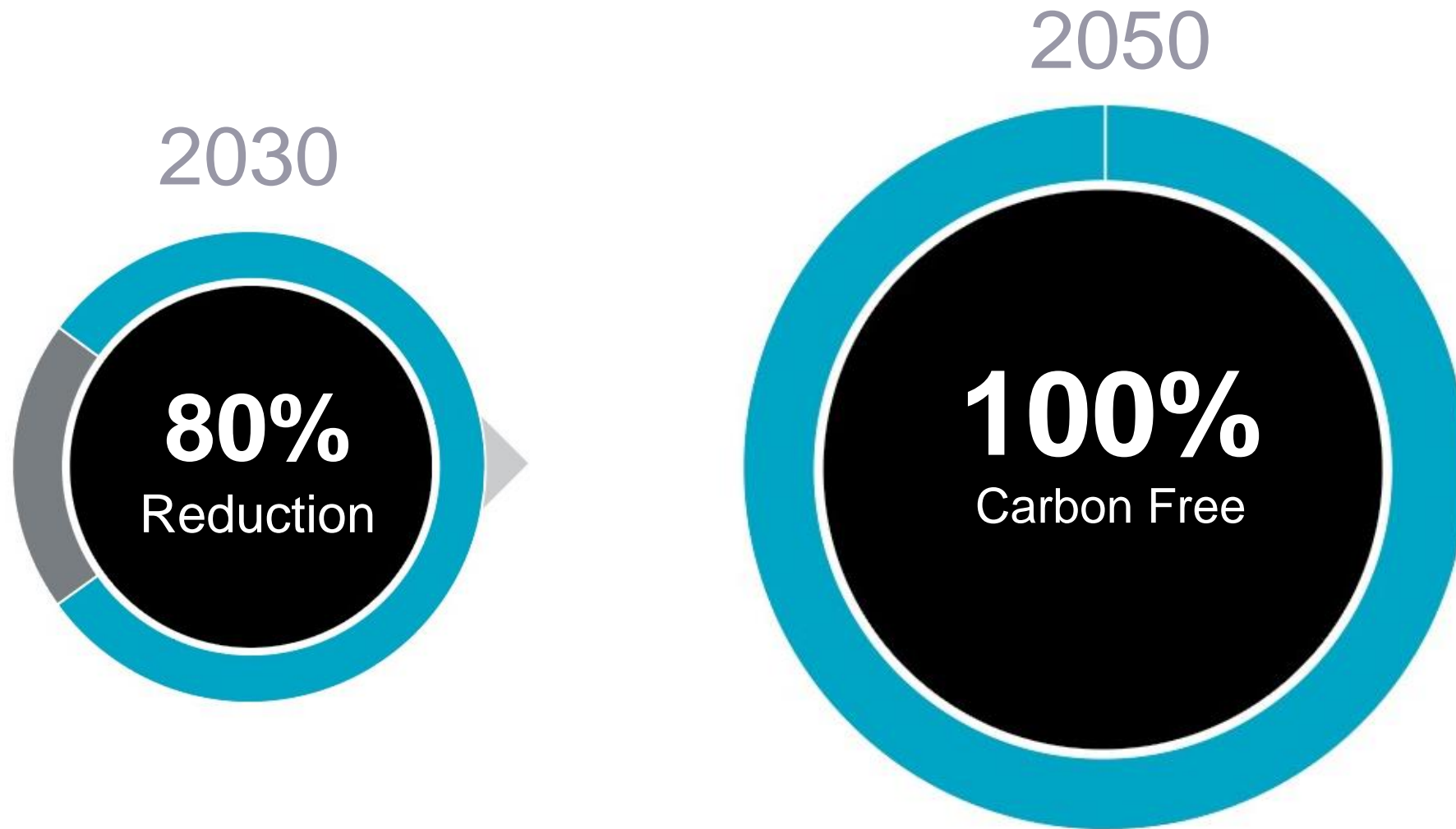
Jill King, Portland General Electric
Sr. Key Customer Manager
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Kevin Schwain

Director, Electric Transportation

Affordable, Carbon-Free Energy for Transportation



Xcel Energy serves Twin Cities and Denver

Four
Operating Companies

Eight
States

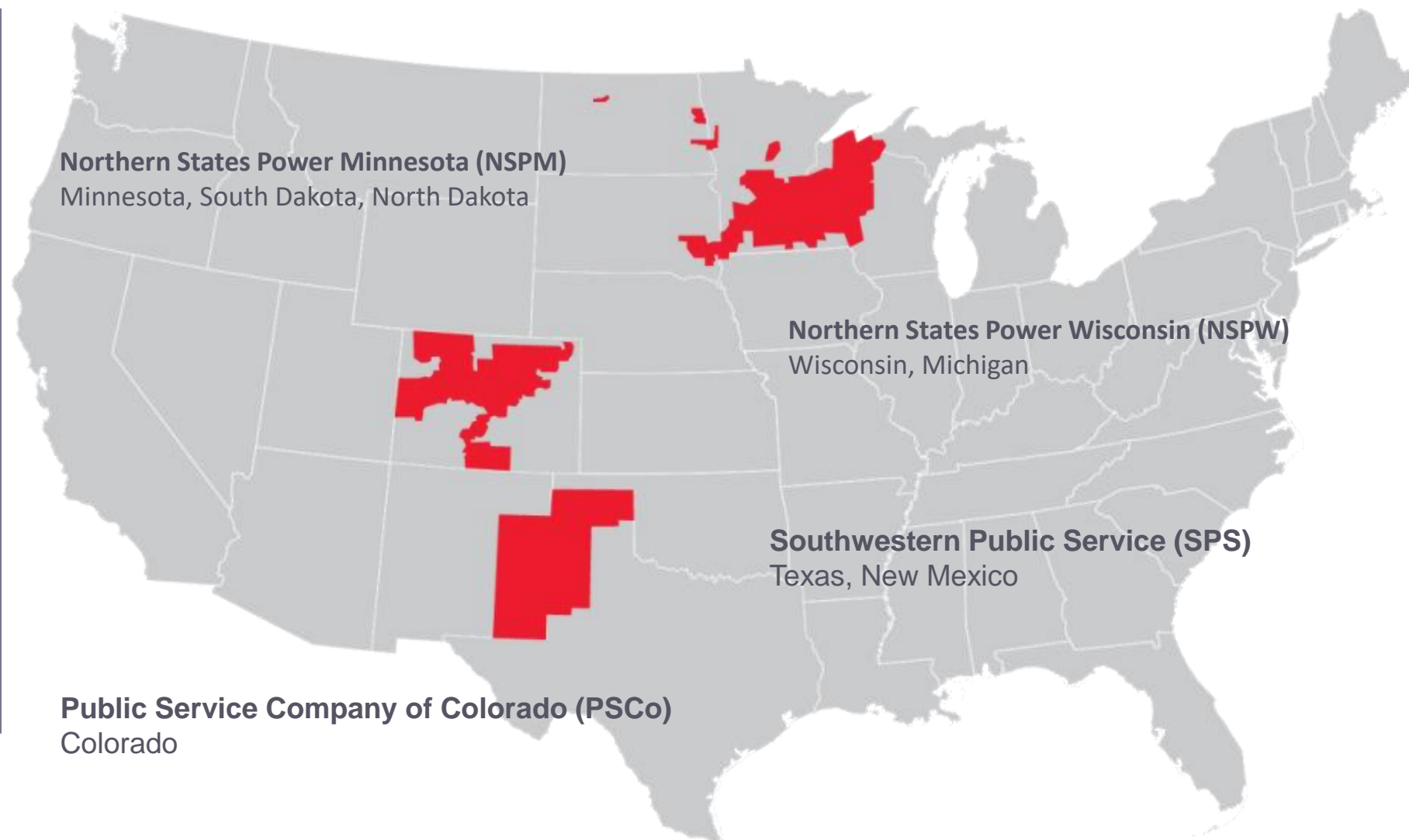
3.6 Million
Electric Customers

2.0 Million
Natural Gas Customers

\$30 Billion
2019 Est. Rate Base

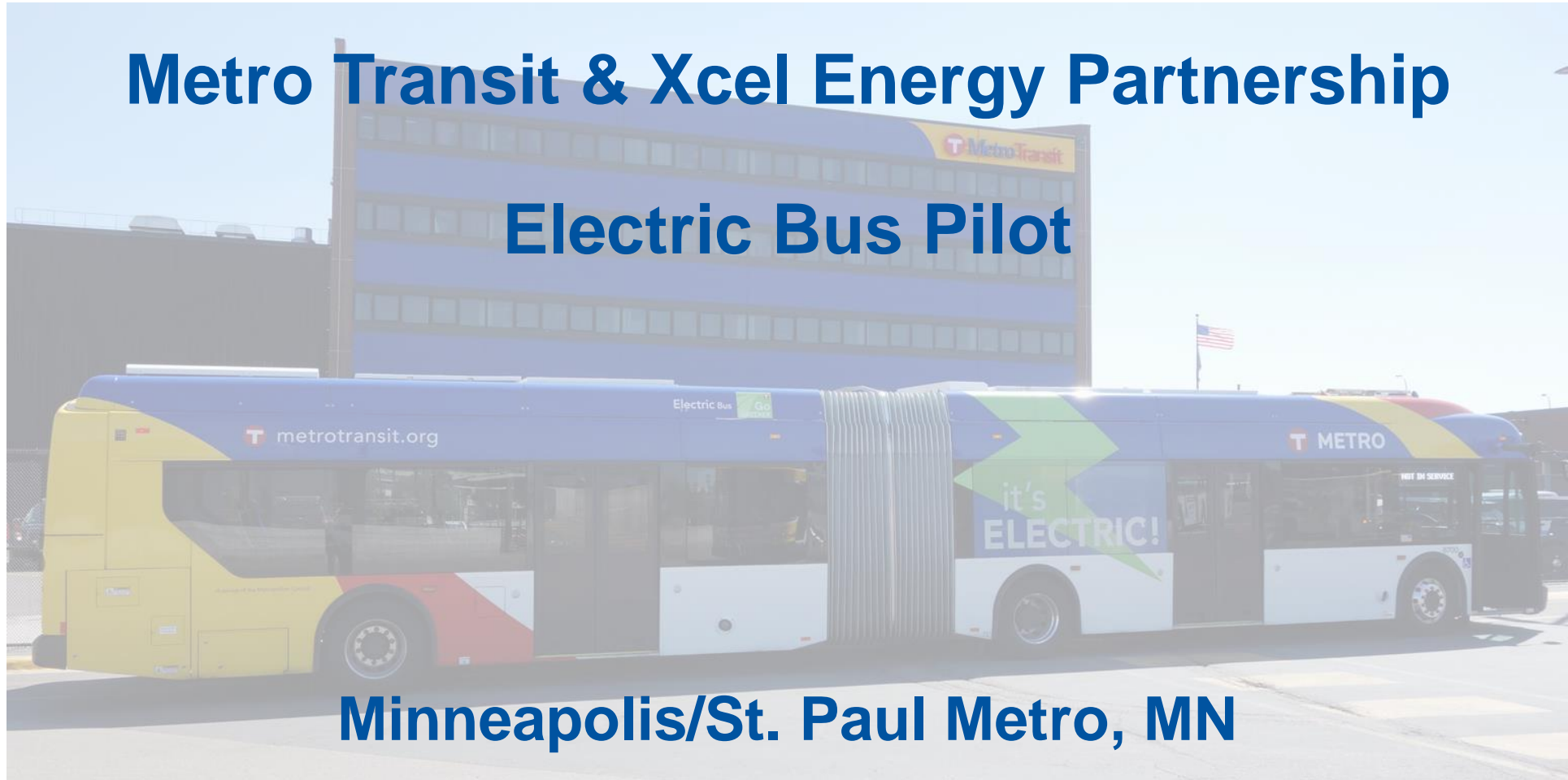
19 GW
Owned Gen. Capacity

11,000+
Employees



Metro Transit & Xcel Energy Partnership

Electric Bus Pilot



Minneapolis/St. Paul Metro, MN



Carrie Desmond, PE

- Principal Engineer
- BEB Charging Infrastructure PM
- New Bus Garage PM

Partnership Overview

FUELED BY ELECTRICITY.

We're working together to bring you a cleaner ride.

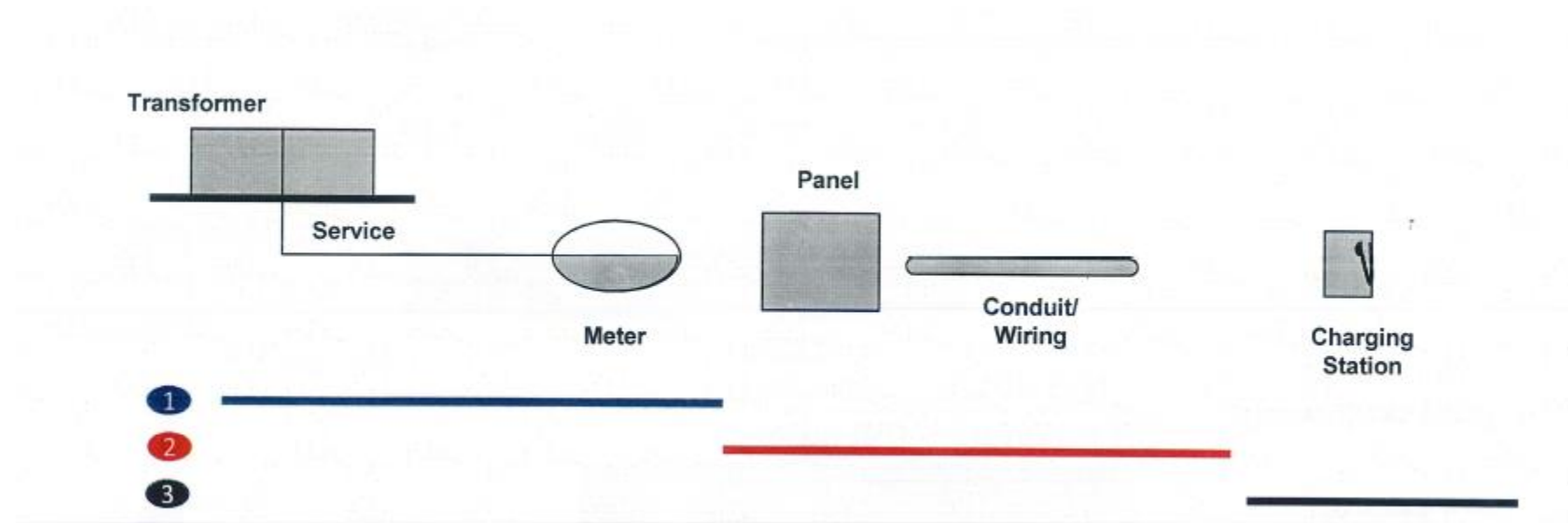


MET COUNCIL, XCEL ENERGY WORK TO GET COUNCIL TO 100% RENEWABLE ENERGY BY 2040

Date: Friday, June 8, 2018

Xcel Energy, the region's largest electric utility, is joining forces with the Metropolitan Council, one of the top 10 electrical consumers in the state, to dramatically increase the Council's use of renewable energy in day-to-day operations.

Make Ready Infrastructure



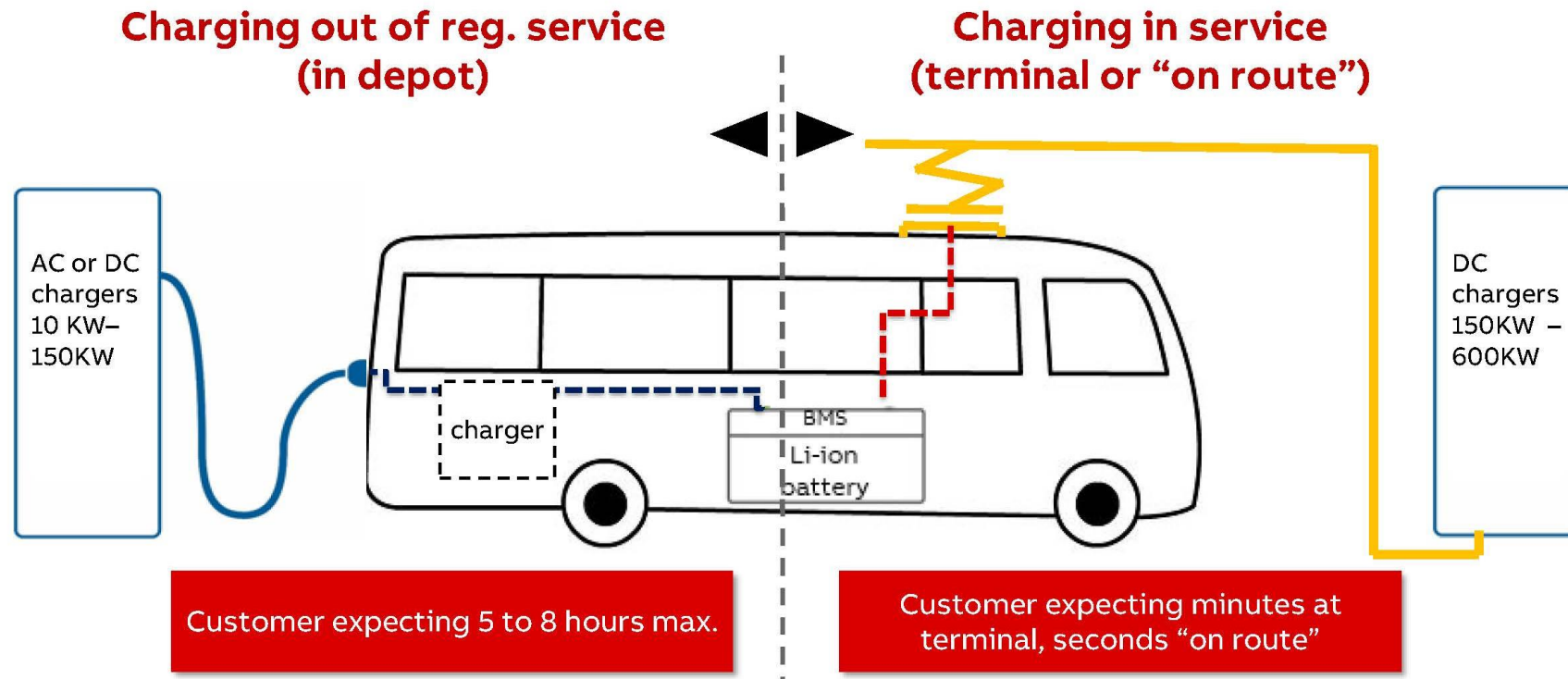
- 1 Xcel typically ends at the Transformer/Meter
- 2 Pilot Project will cover Panel, conduit, and wiring into to base of chargers
- 3 Metro Transit install charging stations

Charging Overview



Charging Strategy

Combination in-depot and on route for range extension



Charging Equipment

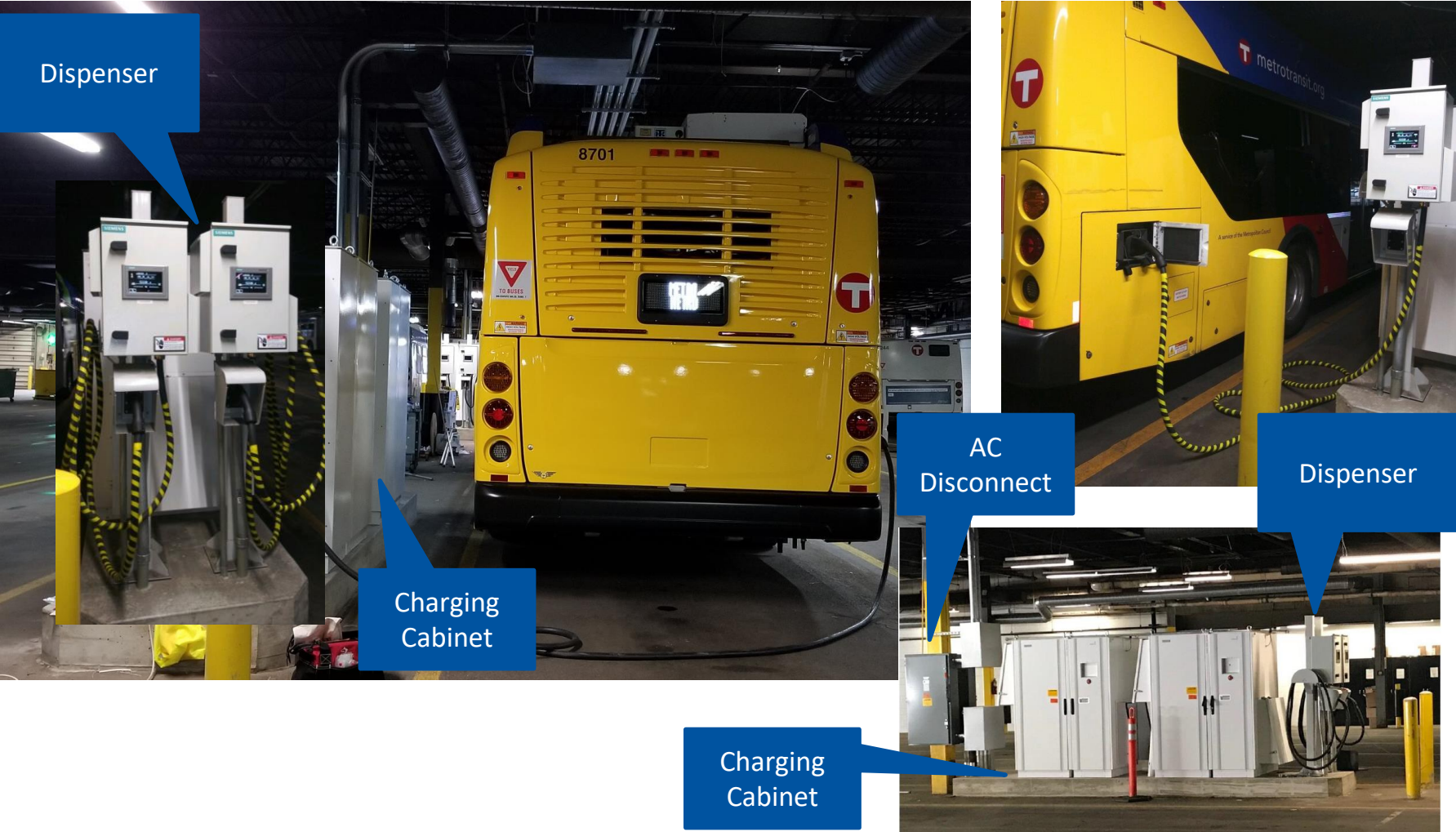


(2) Siemens 300kW
Onroute Chargers

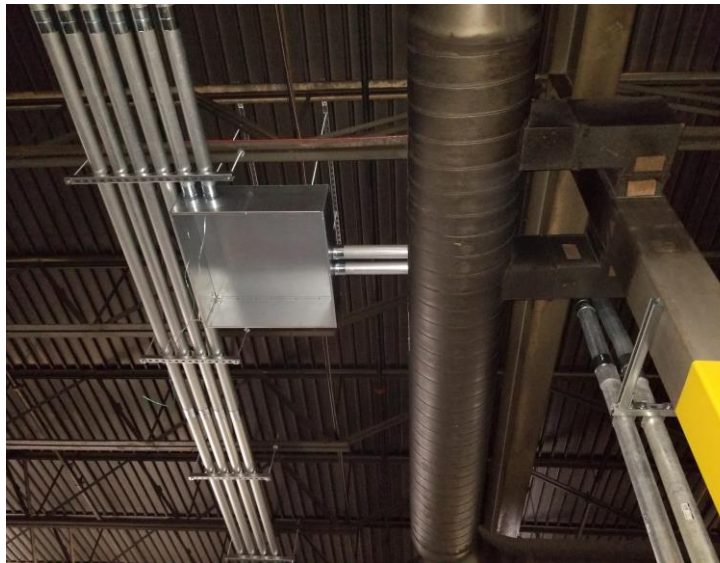
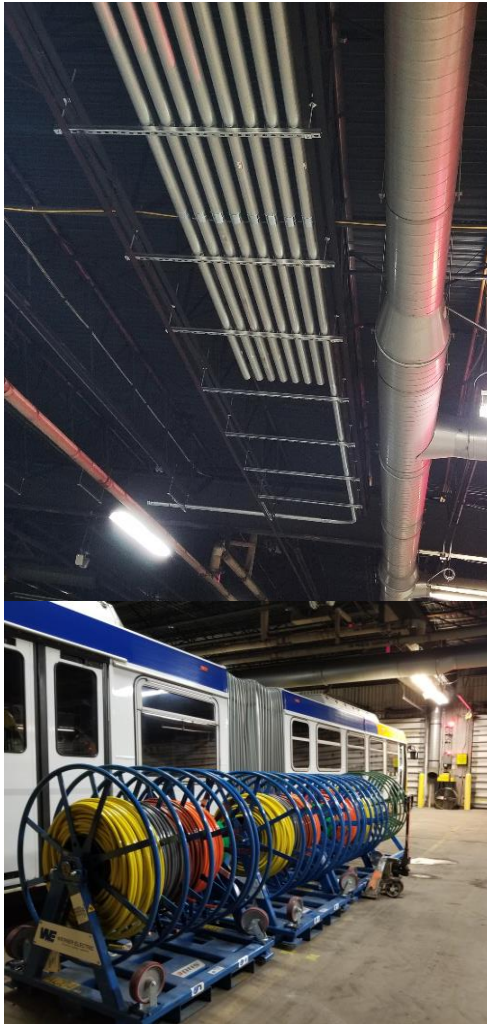


(8) Siemens 150kW Depot
Chargers with Remote
Dispenser

Depot Chargers at Heywood Garage



Depot Charger Install – Conduit & Wiring (by Xcel)



Depot Charger Install – Foundations (by Metro Transit)



Depot Charger Install – Switchgear (by Xcel)



Depot Charger Install – Chargers (by Metro Transit)



Installation Time Lapse

On Route Chargers



On Route Charger Install – Conduit & Cabling (both)



On Route Charger Install – Pantographs (by Metro Transit)

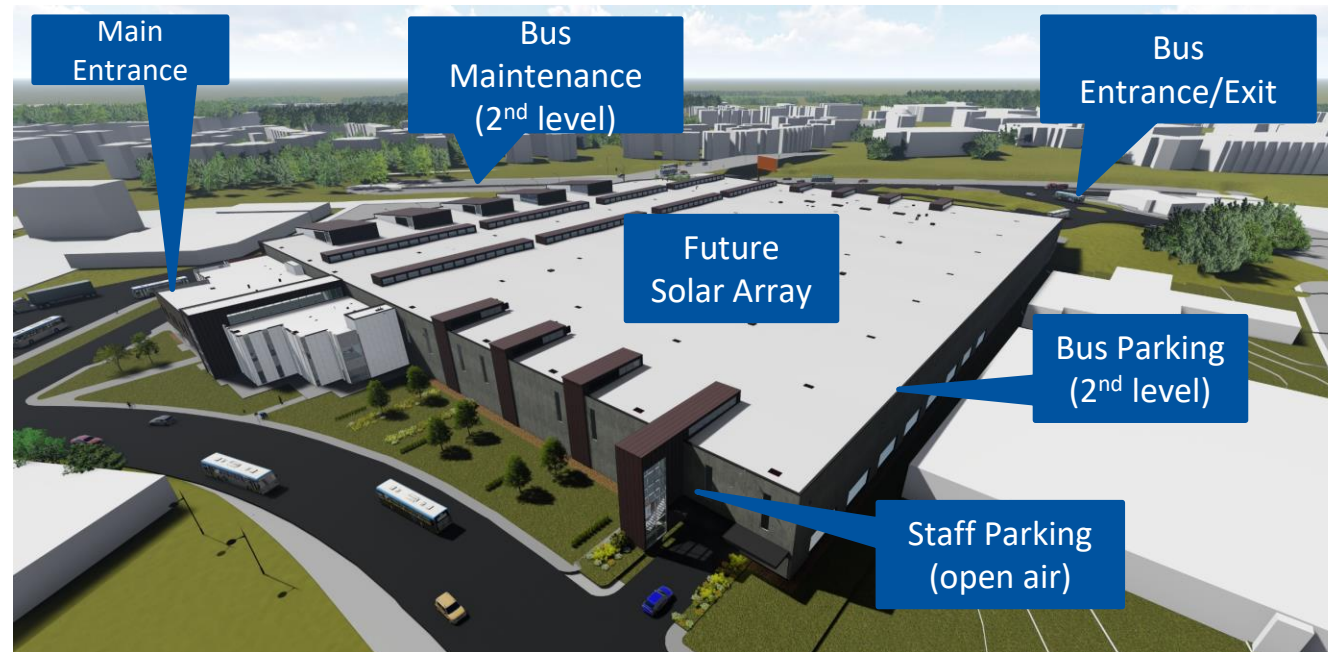


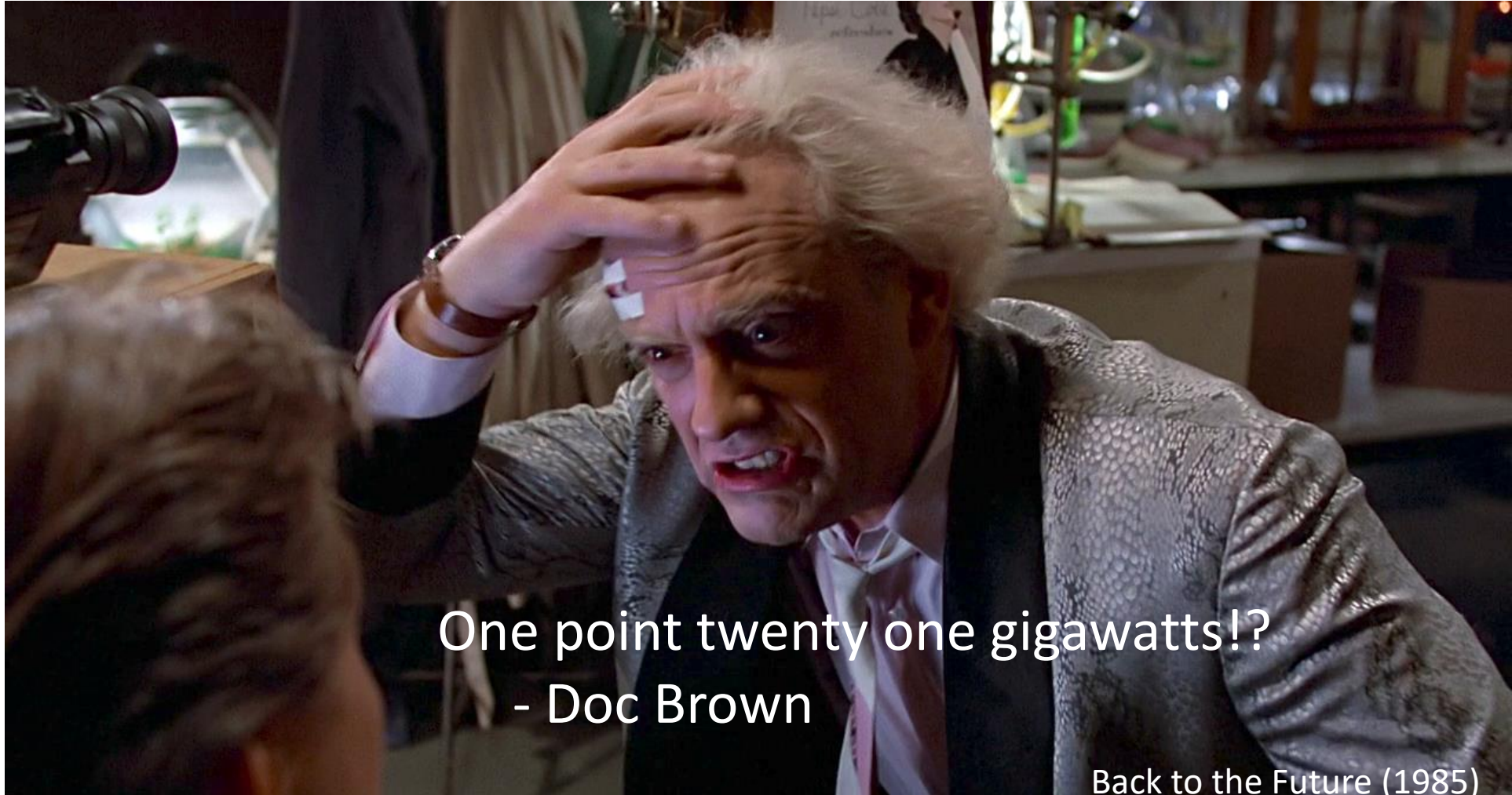
On Route Charger Install – Chargers (by Metro Transit)



Where do we go from here?

- Master Planning
- New Minneapolis Bus Garage – Phased Electrification
- New Minneapolis Bus Garage – Renewables & Quick Charge
 - FY19 Low/No Emissions Grant Awarded in partnership with Xcel





One point twenty one gigawatts!?
- Doc Brown

Back to the Future (1985)

30 MW by 2030 – Metro Transit Main Campus



The background image shows a modern Metro Transit building with a prominent brick clock tower. In the foreground, a blue and white Metro Transit bus is parked at a station. The bus has a colorful rainbow stripe along its side and the word 'METRO' on its front. A bicycle is visible on the bus. The scene is set during the day under a clear sky.

Carrie Desmond
Principal Engineer
Metro Transit
Carrie.Desmond@metrotransit.org
612-349-7798

Thank you!

RTD's Partnership with Xcel Energy

Improving a
transit agency-utility
relationship that started
out on the wrong foot

Carly Macias

Senior Transportation Planner
Regional Transportation District (RTD)
Denver, Colorado



RTD Electric Bus Fleet

- RTD Total Fleet: 1,035 Buses and 238 Rail Vehicles
- 36 Electric Buses operate Free MallRide shuttle service
- Free MallRide runs 90-second headways during AM & PM peak periods
- Buses stop at every intersection
- Charged overnight with 30 Depot Chargers (each 80 kW)
- Average weekday ridership: 35,000
- Average Monthly Miles: 1,000/vehicle
- Total Cumulative Miles: 1.2 million



Challenging Beginning

NEWS > COLORADO NEWS

RTD's electric 16th Street Mall buses cost nearly 60% more to operate than diesel coaches

Transit agency says "demand charge" levied by Xcel Energy on electricity costs is to blame



Guest Post: As Xcel Gouges RTD to Charge Electric Buses, California Model Could Help

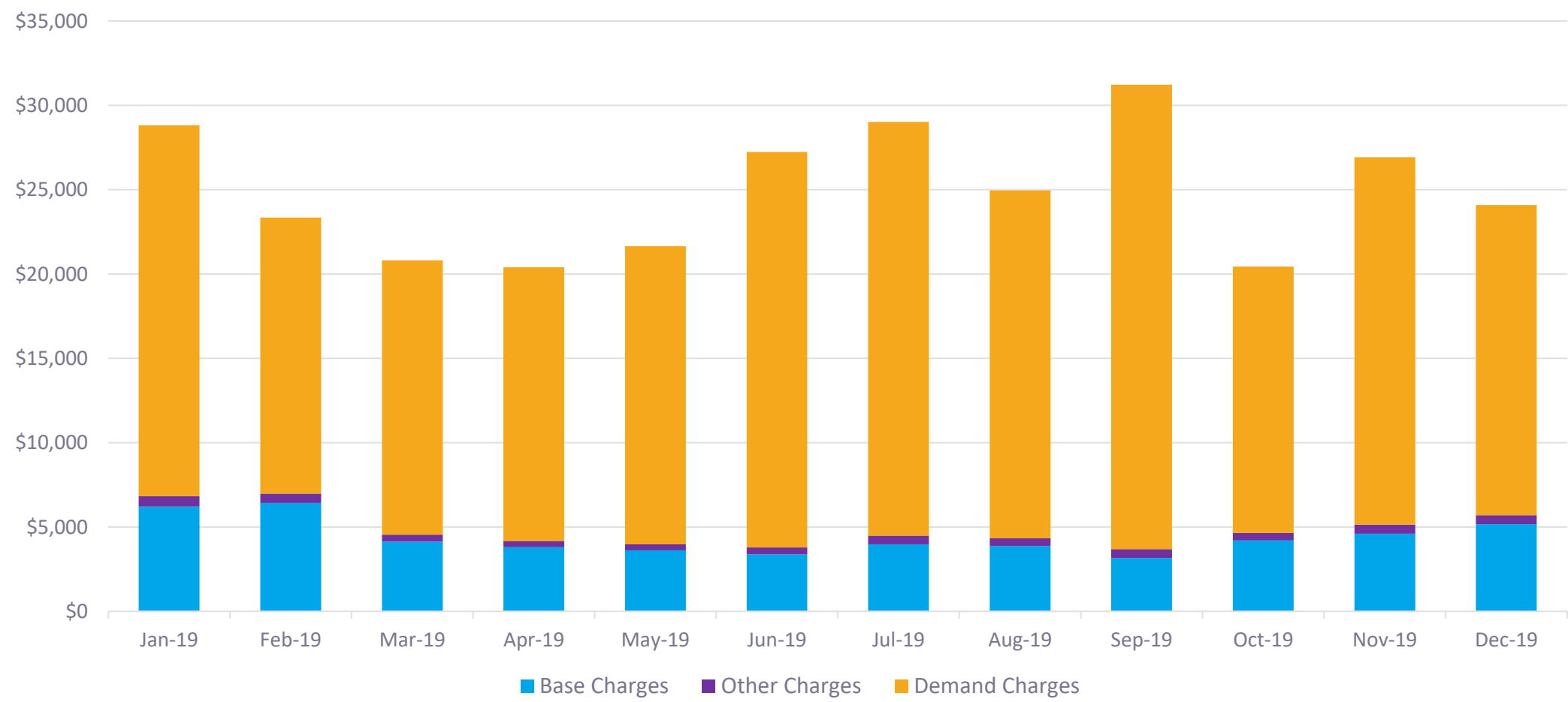
By Miles Muller | May 15, 2019 | 1 COMMENT



When RTD charges the electric buses used for 16th St. FreeMall Ride, Xcel Energy adds a fee that amounts to 82%. Photo: Andy Bosselman

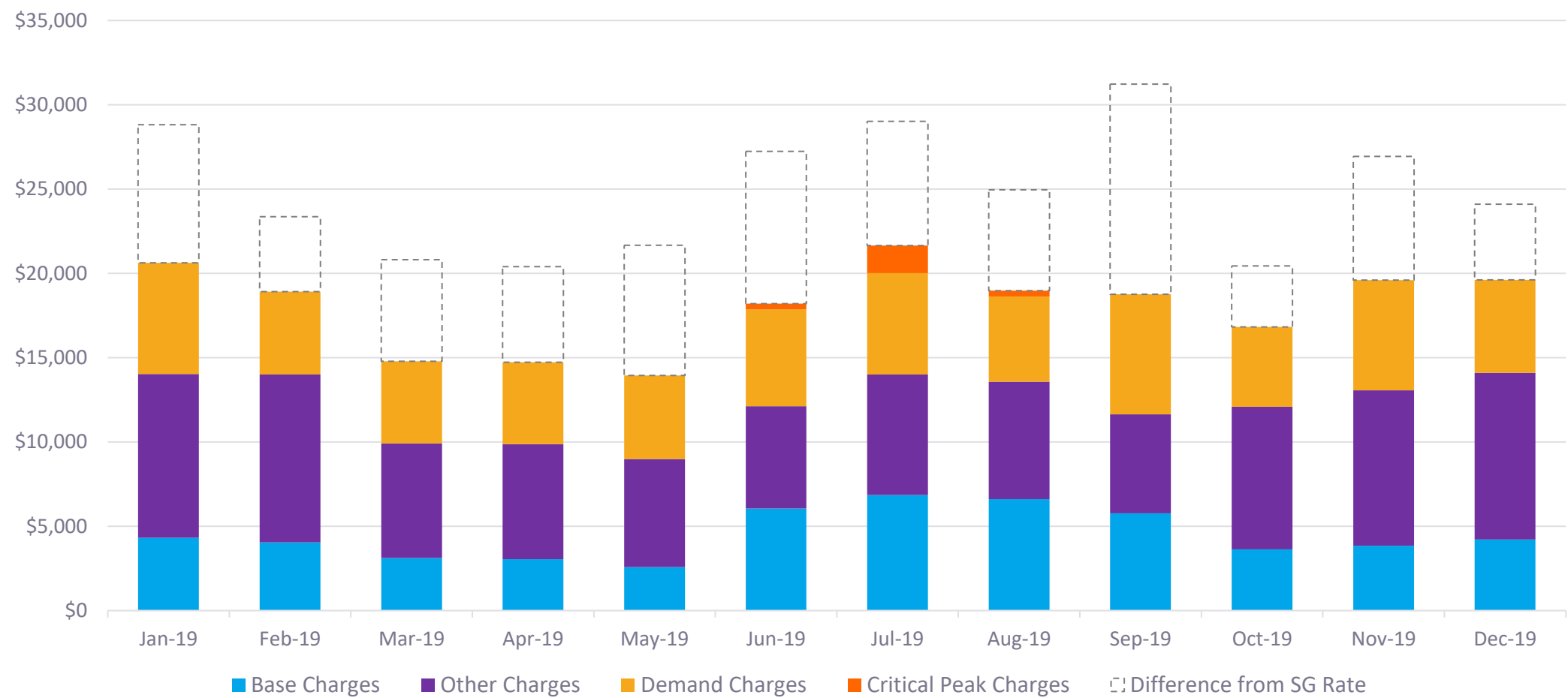
Electricity Costs: SG Rate

About 80% of RTD’s monthly electric bill was from demand charges



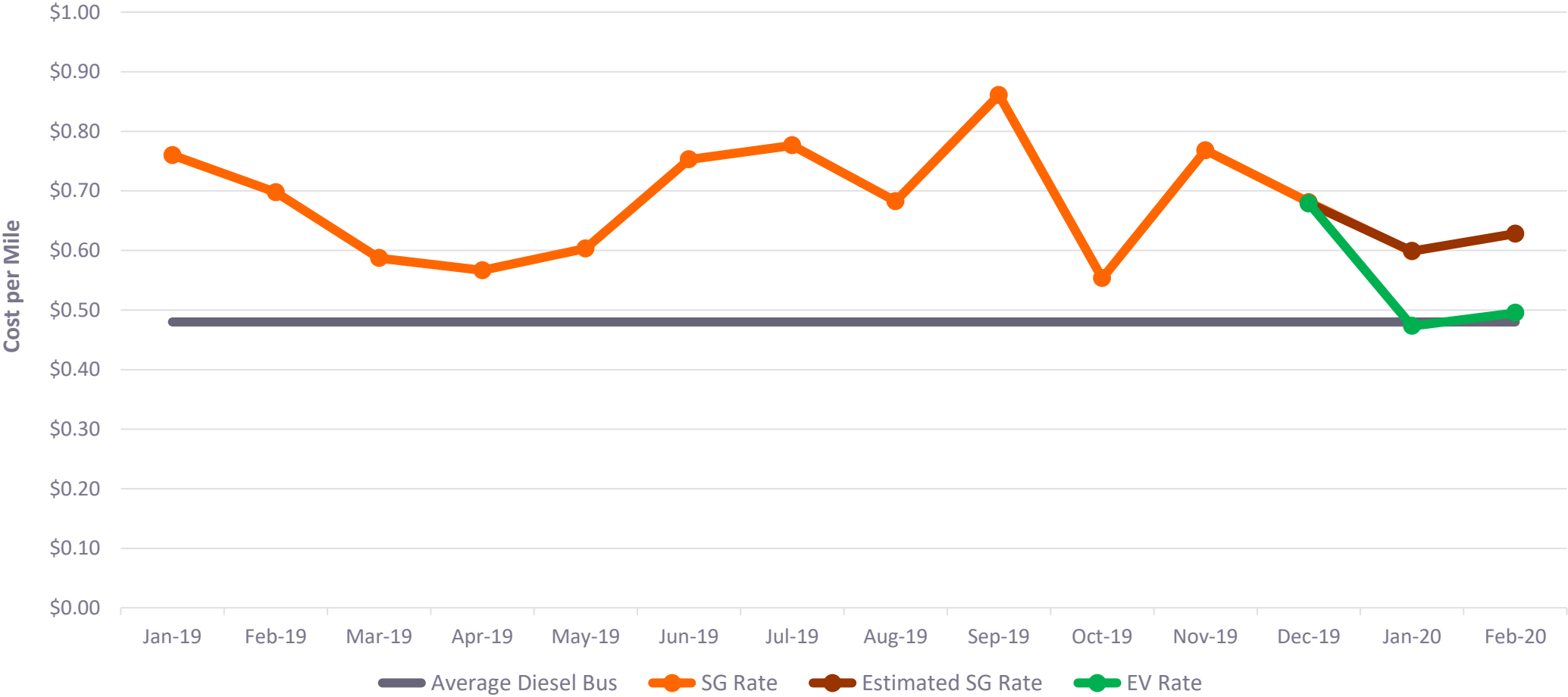
Electricity Costs: New EV Rate

RTD will cut annual costs by 25-30% with the new EV Rate



Electricity Costs: New EV Rate

During the first two months on the EV Rate, RTD has saved about 20%



Next Phase of the RTD-Xcel Partnership

- Improved Coordination
- 17 Electric Buses Funded by Grants to be Deployed in 2022/2023
- Xcel EV Supply Infrastructure Program
- Xcel Transportation Electrification Plan Research Opportunities
- Sharing lessons learned and ideas with Metro Transit (also an Xcel customer)





Carly Macias
Carly.Macias@rtd-denver.com
www.rtd-denver.com

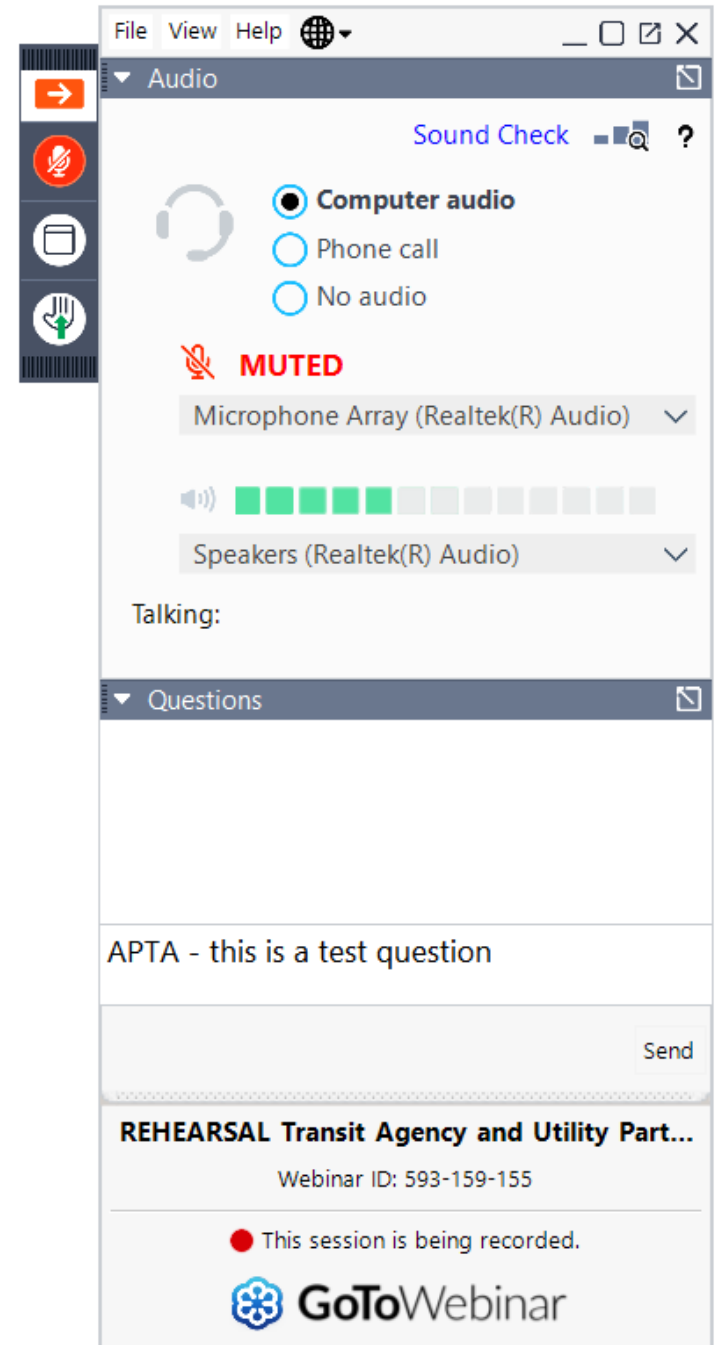
Panel Discussion

Audience Questions

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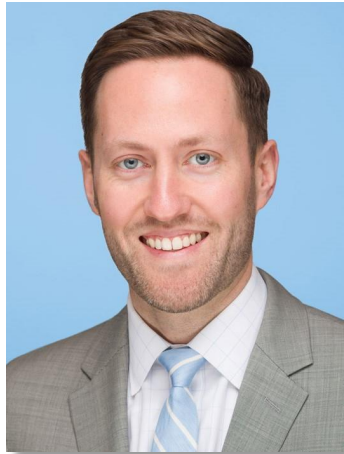


The screenshot displays the GoToWebinar interface. The top menu bar includes 'File', 'View', 'Help', and a globe icon. The 'Audio' panel is active, showing 'Sound Check' with a speaker icon and a question mark. Below this, there are three radio button options: 'Computer audio' (selected), 'Phone call', and 'No audio'. A red 'MUTED' status is displayed with a microphone icon. The audio output is set to 'Microphone Array (Realtek(R) Audio)' and the speakers are 'Speakers (Realtek(R) Audio)'. A volume bar is visible. The 'Questions' panel is also shown, with a text input field containing 'APTA - this is a test question' and a 'Send' button. At the bottom, the webinar title 'REHEARSAL Transit Agency and Utility Part...' and ID 'Webinar ID: 593-159-155' are displayed, along with a red dot indicating 'This session is being recorded.' and the GoToWebinar logo.

Moderators and Panelists



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Portland General
Electric



Kevin Schwain
Xcel Energy

Webinar Series: Electric Buses, Utilities & Infrastructure

Webinar 1: *Transit Agency and Utility Partnerships: Best Practices and Strategies for Working Together Toward Successful Electric Bus Deployments (May 2020)*

- A recording of this webinar is posted on APTA's website .

Webinar 2: *Transit Agency and Utility Partnerships: Case Studies from Minneapolis, Denver and Portland (today)*

- A recording of this webinar will be posted on APTA's website next week.

Webinar 3

- Topic: New infrastructure considerations for various charging strategies (Date TBD)

Thank you.