



REGIONAL TRANSPORTATION COMMISSION

Metropolitan Planning • Public Transportation & Operations • Engineering & Construction

Metropolitan Planning Organization of Washoe County, Nevada

RTC Electric Bus Program

**Amy Cummings, AICP, LEED AP
RTC Interim Executive Director**

Your RTC. Our Community.

RTC Electric Bus Program



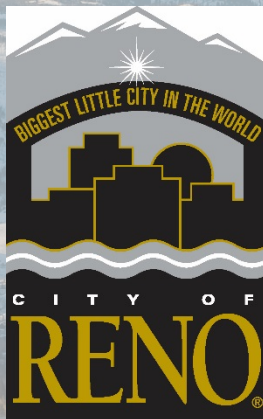
- About RTC
- Benefits of Electric Buses
- RTC Electric Bus Program
- Challenges / Lessons Learned



Regional Transportation Commission of Washoe County Governance



The RTC is a cooperative regional board comprised of five representatives appointed from the three local government jurisdictions.



Regional Transportation Commission of Washoe County Role



- Metropolitan Planning Organization
- Transit Service Authority
 - RIDE, RAPID, ACCESS, INTERCITY
- Regional road construction, & preservation

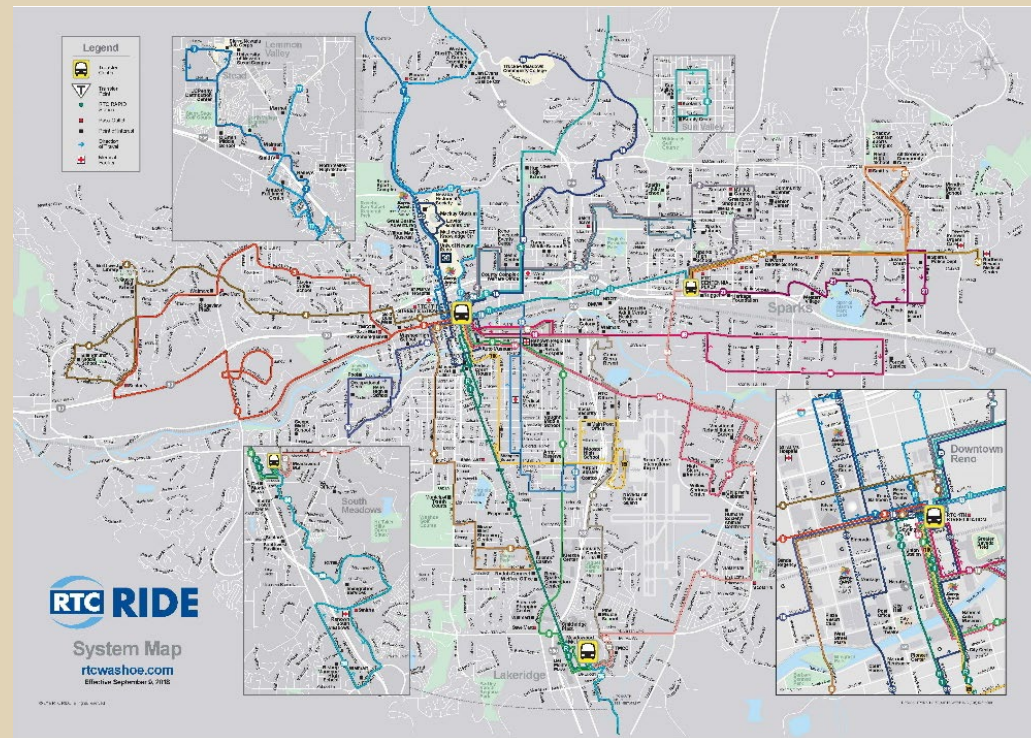


RTC Transit Service



Serving Reno & Sparks NV since 1978

- 8 million annual trips
- 26 Routes
- 68 Fixed Route Buses
- 21 Electric Buses
- 2 BRT Lines
- 45 CNG Paratransit Vehicles



Benefits of Electric Buses



- **Environmental sustainability**
 - Improve air quality & reduce GHG emissions
- **Customer experience**
- **Potential for cost savings**
- **Goal to convert entire fleet to alternative fuels by 2030**



SUSTAINABILITY PLAN



Benefits of Electric Buses



- **Nevada Governor Steve Sisolak Signed Executive Order to Reduce GHG on November 22, 2019**



RTC Electric Bus Program



- **4 Proterra BE 35 (2014)**
 - Short range 30 miles
 - 4 minute charge time (about 10%)

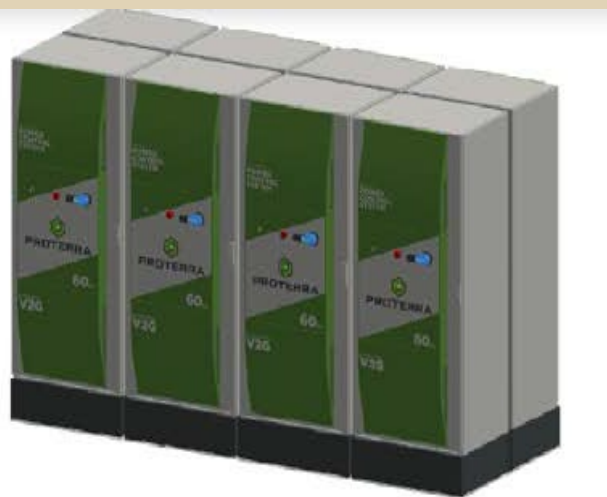


- Overhead fast charger
- Rate of charge 480 kWh

RTC Electric Bus Program



- **17 Proterra Catalyst (2018)**
 - Long range 90-130 miles
 - 6 – 7 hours charge time
 - Overnight charging
 - Rate of charge 60 kWh



- But – also can charge on fast charger!
- Rate of charge 300 kWh

RTC Electric Bus Program



- **Used on Lincoln Line BRT on US 40 between Reno & Sparks**

RTC Electric Bus Program



- Used on Regional Connector between Reno & Carson City

Villanova Maintenance Facility Upgrades



- \$15m improvements
- Bus bay door height
- Charging infrastructure

Before



After



Villanova Maintenance Facility Upgrades



- Charging infrastructure
- Maintenance bays



Before



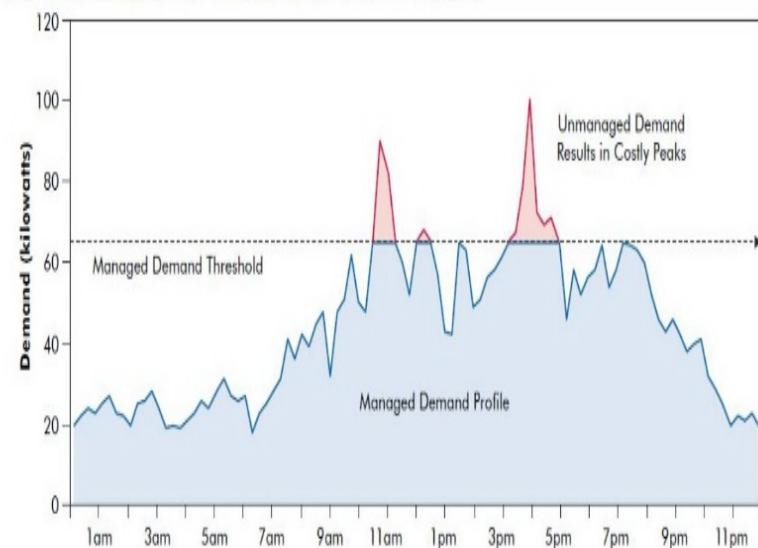
After

Lessons Learned



- **Electrical Demand Charges**
 - Demand charge or peak demand (KW) is highest rate of usage during any 15 minute period during the month
 - Peak demand determines cost for the entire month
 - Billed between \$10 and \$30 per KW

How battery storage can help manage electricity demand over a 24-hour period



Through the deployment of an energy storage system, peak demand can be effectively capped at a specified level—significantly reducing utility demand charges. Assuming a demand charge of \$10 per kilowatt and peak demand reduction from 100 kilowatts to 65 kilowatts each period (as shown here), energy storage could reduce the customer's demand charge by \$350 per billing period, amounting to an annual savings of \$4,200.

- **Infrastructure**
 - For a few buses - relatively simple – tie into building system
 - For a large number of buses - can be costly and complex
- **Upgraded transformers, switch gear, distribution panels**
- **Number / geographical distribution and type of chargers**



Challenges / Lessons Learned



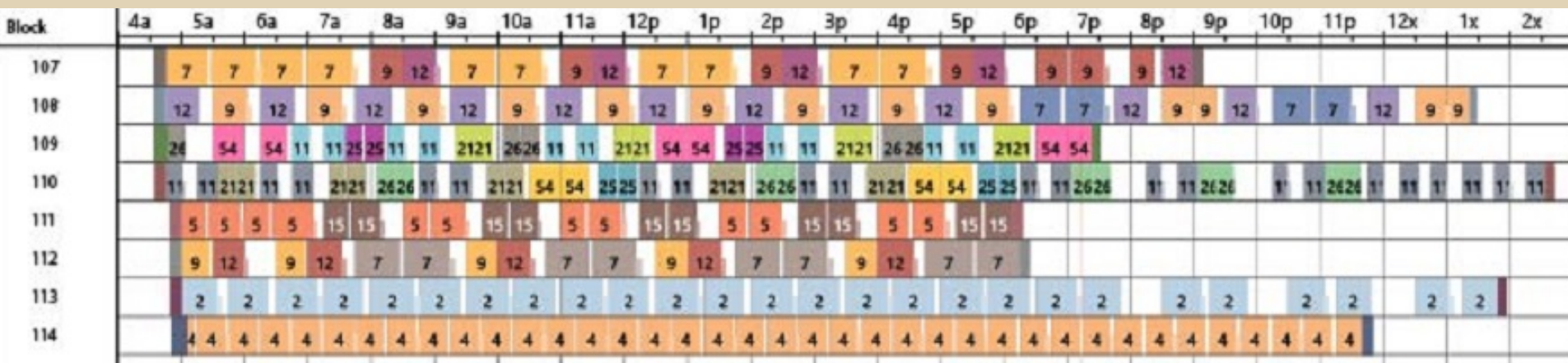
- Short range buses work well on fixed routes of short duration
- Predictable range and performance
- Short range buses fast charge at 480kWh during the peak rate period, longer range buses charge overnight at lower rate
- Power outages and charger issues may put vehicles out of service



Scheduling



- **Electric Buses may require different scheduling process**
 - Range is shorter than diesel
 - Energy costs vary with time and kWh needed
 - Opportunity Charging – Gaps in schedule

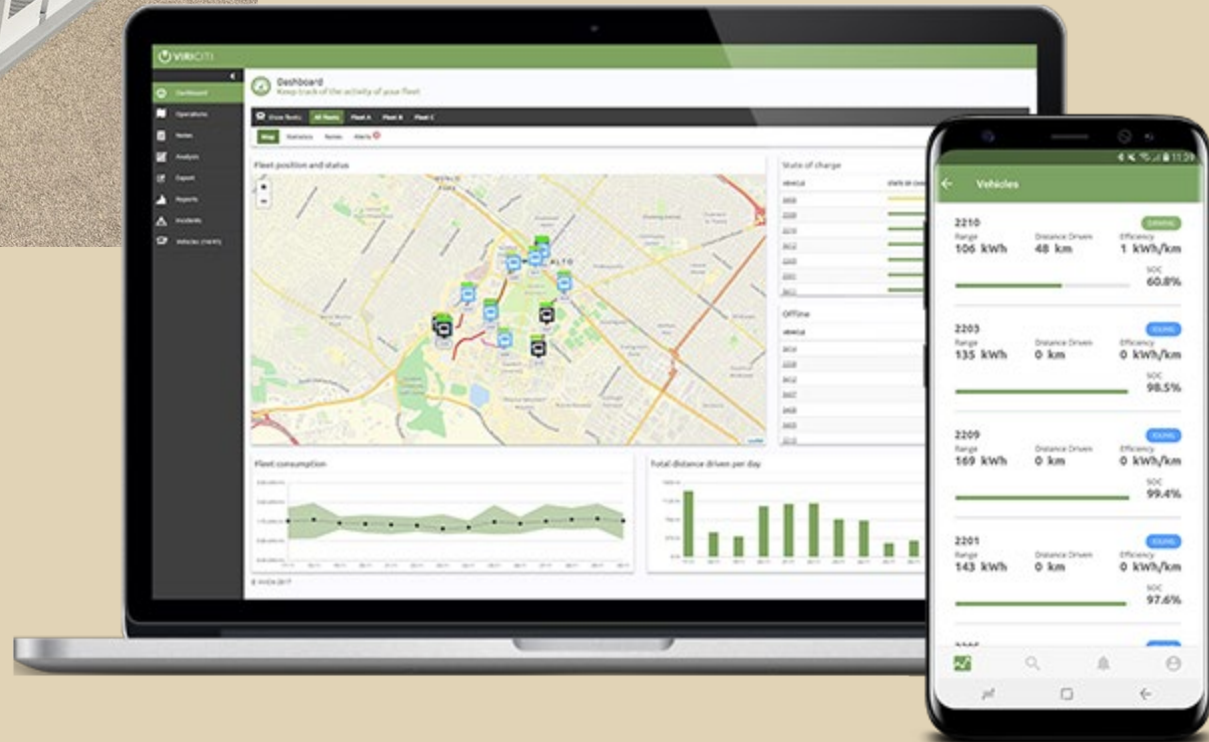


Next Steps



Data Collection / Analysis

Battery storage



Life Without Diesel: Operations Planning for Emerging Vehicle Technologies



Thank You!

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