+ NYSERDA EV Study Results

Advanced Energy Conference
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Brian Conlon, Consultant
Eric Cutter, Director
Nancy Ryan, Partner

Utilities have crucial role in transportation electrification

+ **Providing renewable energy**
+ **Helping NY achieve ZEV goals**
+ **Enabling customer choice**
+ **Deploying infrastructure**

Renewable Energy

- 50% renewable electricity by 2030
- 40% reduction in GHG by 2030
- DER interconnection

Transportation

- State wide network of charging stations.
- ZEV MOU calls for 3.3 million ZEV's from eight states by 2025

Study approach and partners

- Gather inputs and data
- Develop NY cost-benefit analysis framework
- Evaluate driving and charging behavior data
- Engage utilities
- Model driving, charging and grid impacts

MJB&A

chargepoint®

TE is facing headwinds that state and local policy can offset

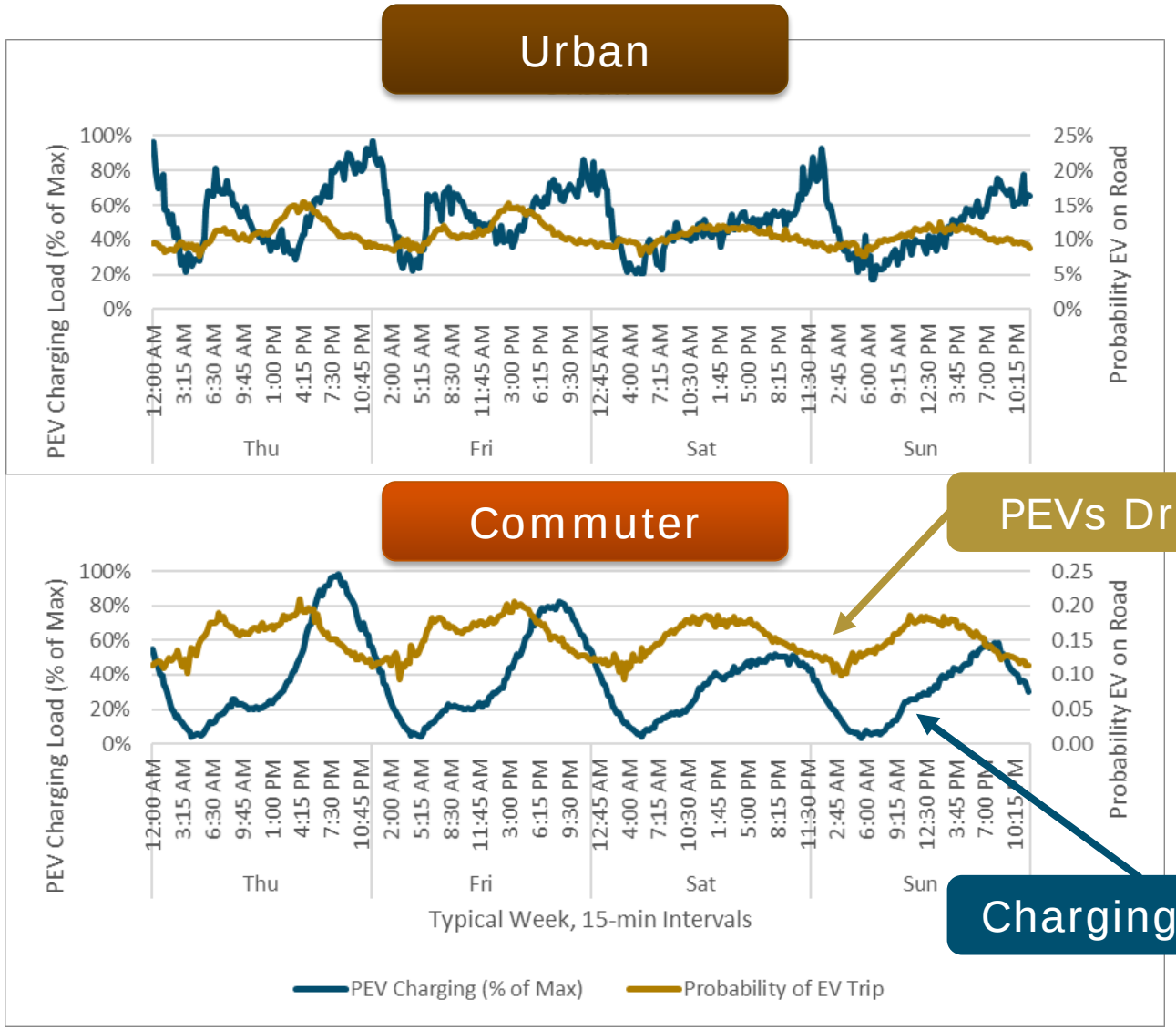
EV costs are falling, but...

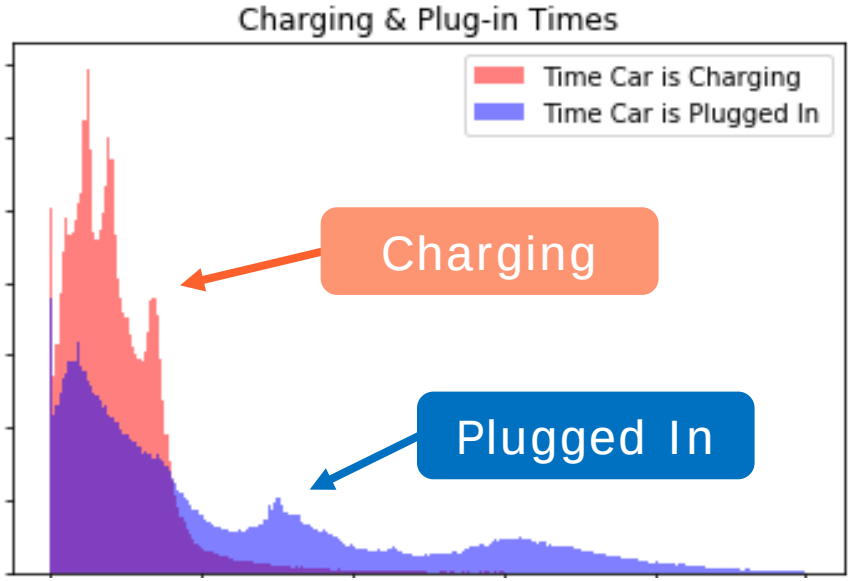
+ **Gasoline prices have fallen too**

+ **Federal tax credit ending soon**

+ **Predicting more public and higher level charging**

Recent driving and charging data informs model





Ford and ChargePoint provided anonymized and aggregated data by region for PHEV and BEV driving and charging sessions

Where drivers can (and will) charge

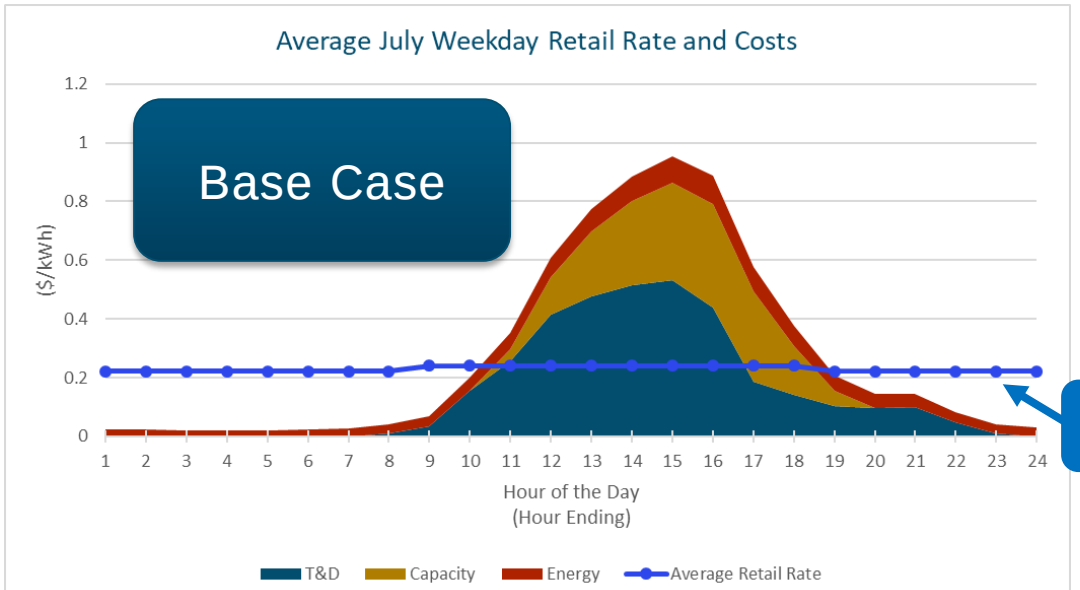
Have Car? | Housing Type? | Charge at Home? | Drive to Work? | Charge at work?

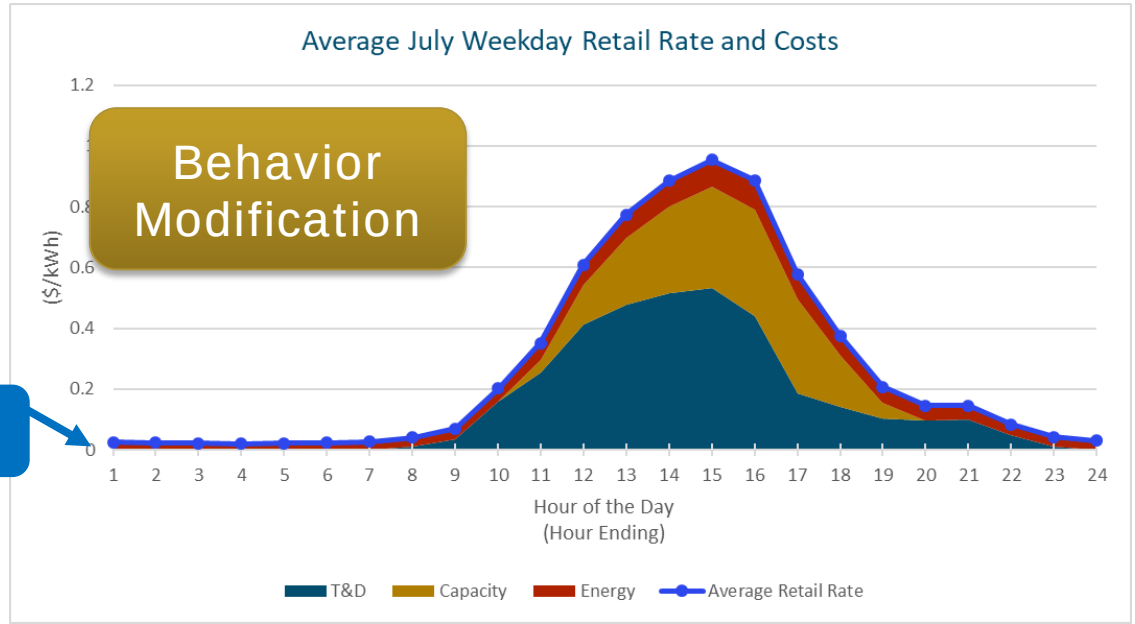
Work Charging	Home Charging	Primary Charging	Secondary Charging	ConEd	LIPA	NatlGrid
Yes	None	Work	Public	10%	6%	8%
	L1	Home	Work	8%	16%	17%
	L2	Home	Work	6%	20%	20%
No	None	Public		33%	8%	10%
	L1	Home	Public	25%	22%	20%
	L2	Home	Public	17%	28%	24%

American Community Survey

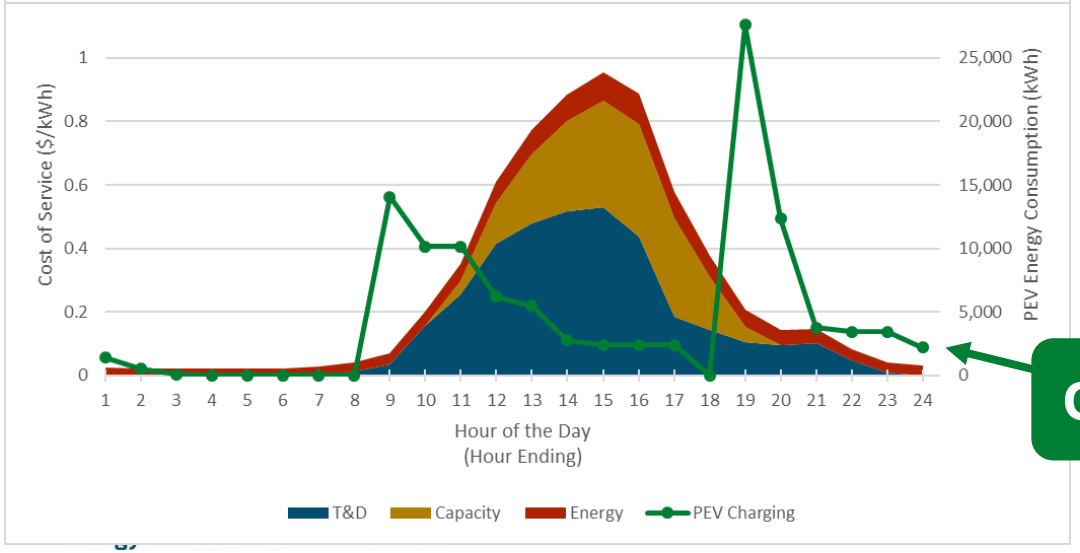
UC Davis ITS Observations on Consumer Motivations to DC Fast Charge

EVGrid model simulates charging behavior based upon rate and type of charger available

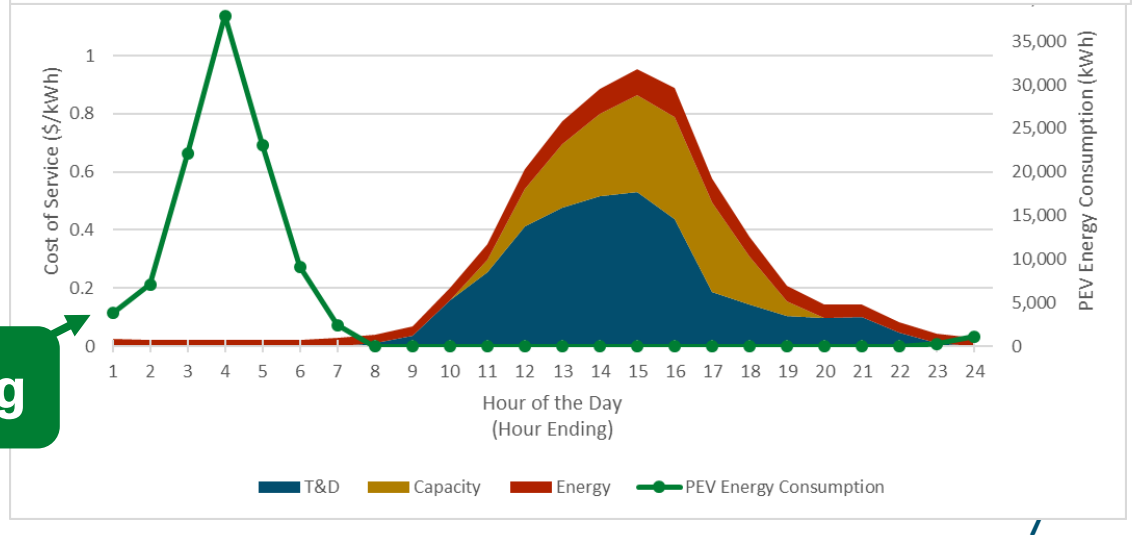




Rate

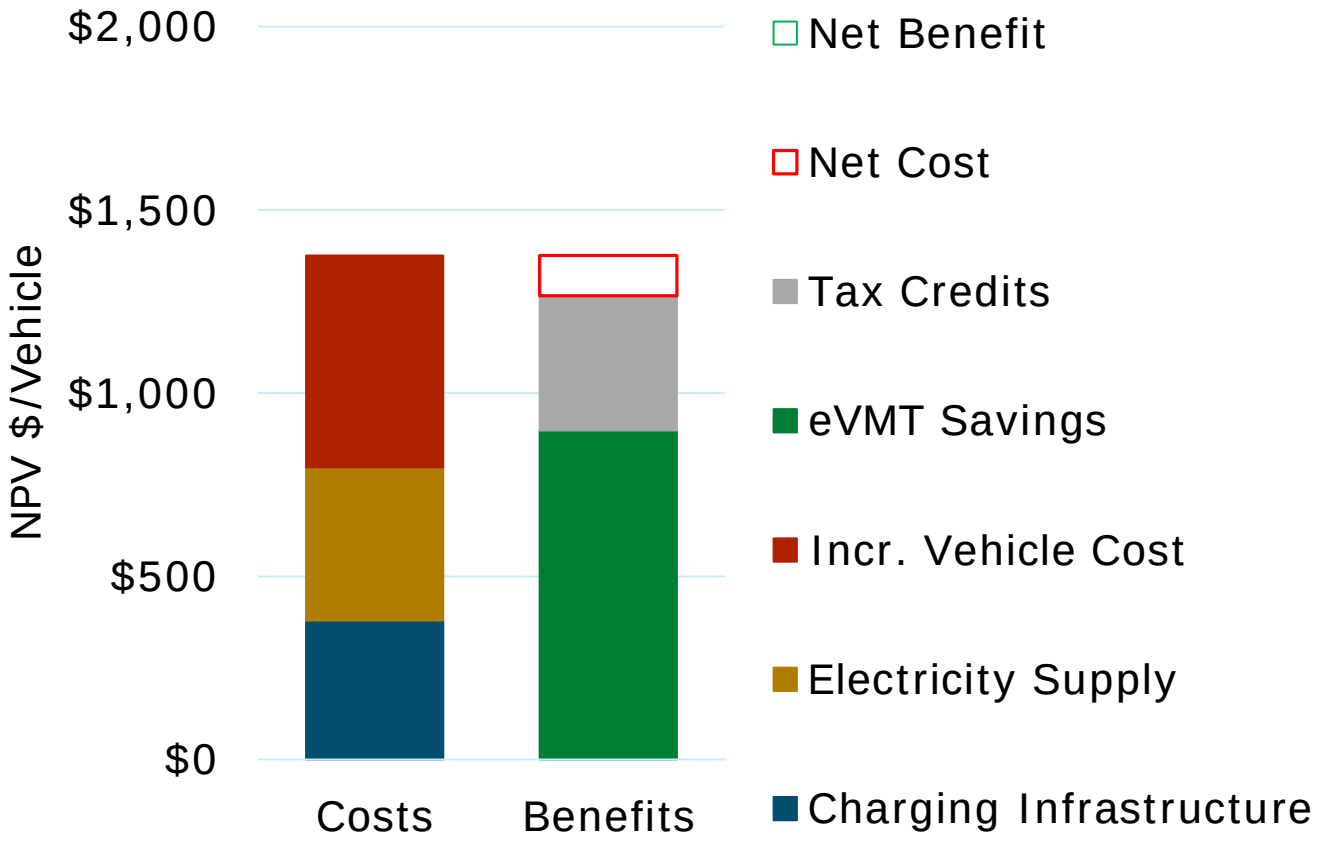


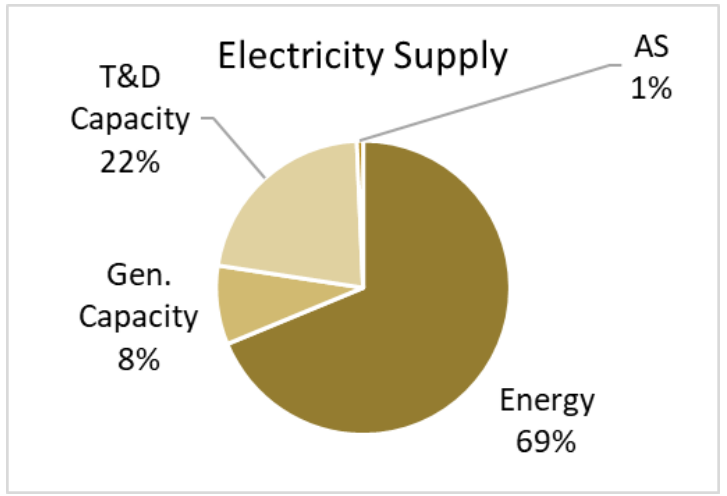
Charging

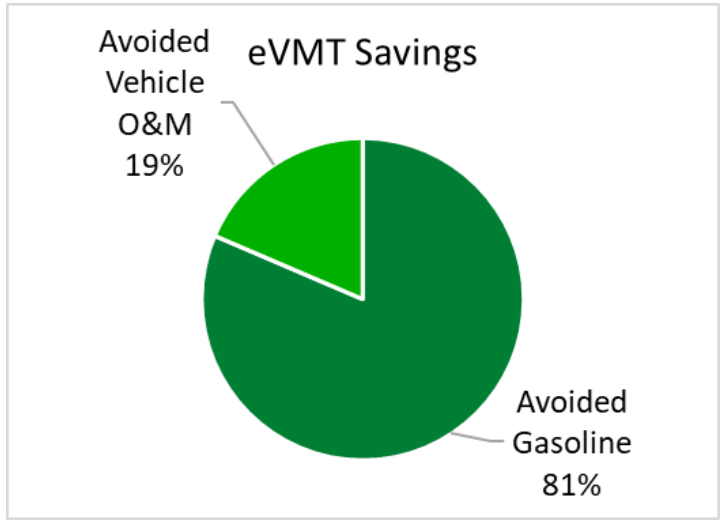


Regional benefits: preliminary results

Base Case

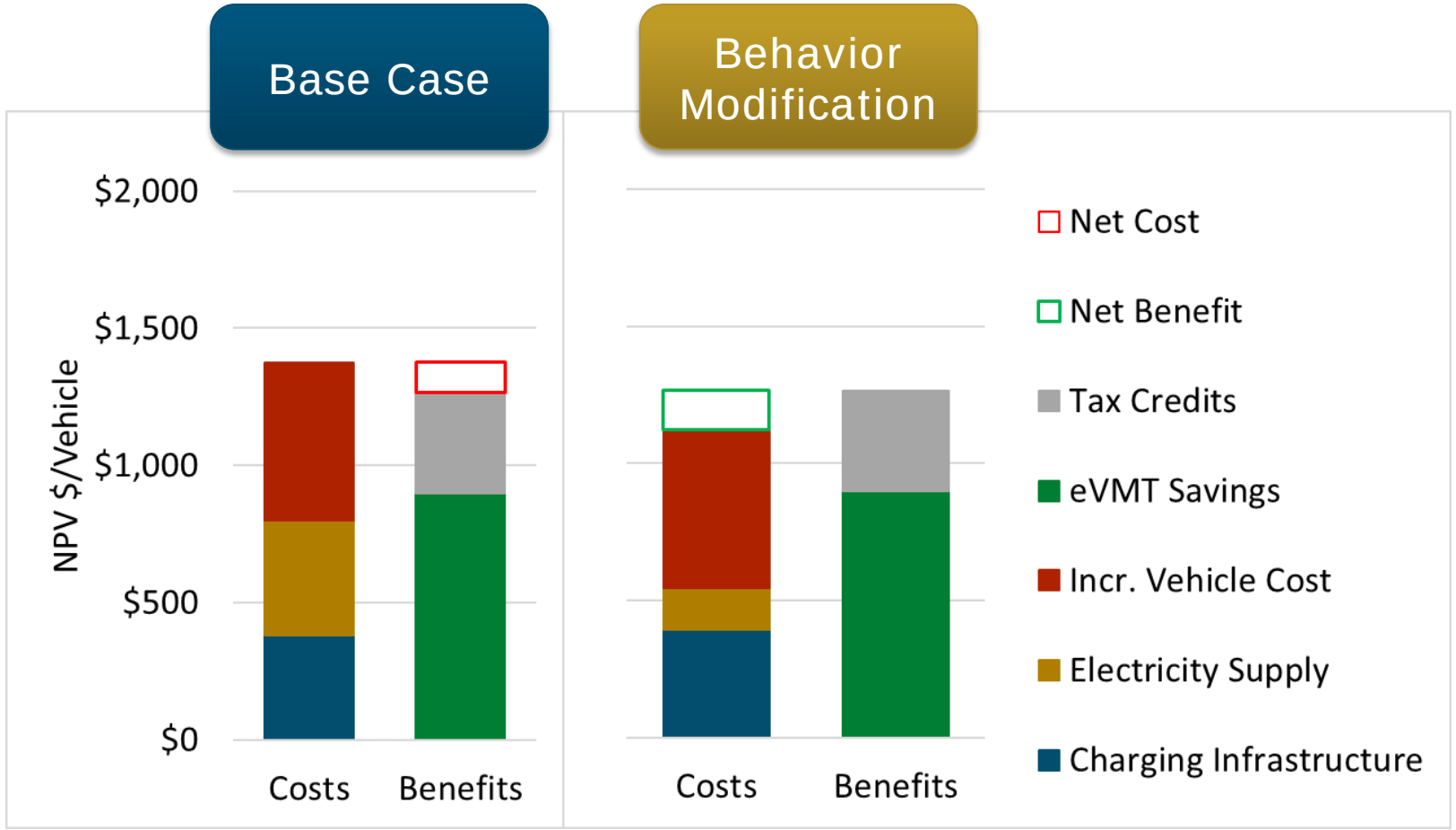


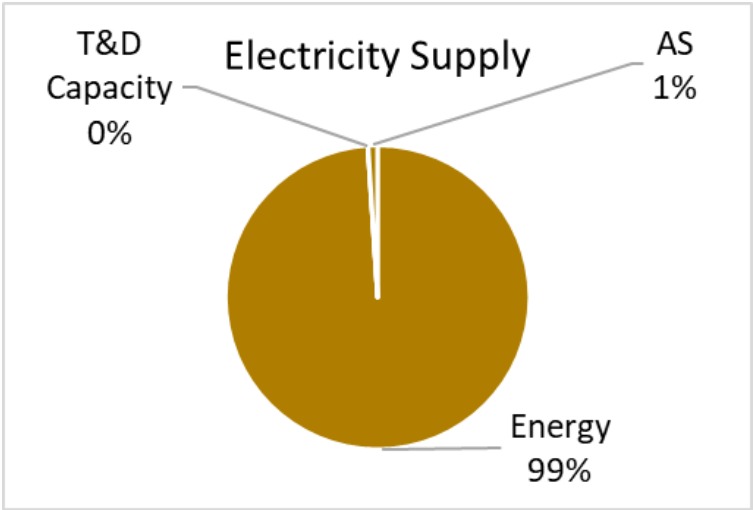


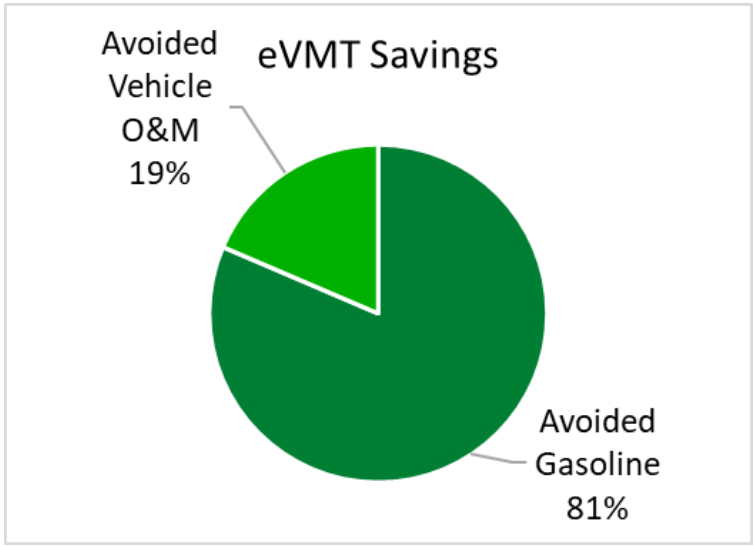


Preliminary results for single utility

Net regional benefits with managed charging



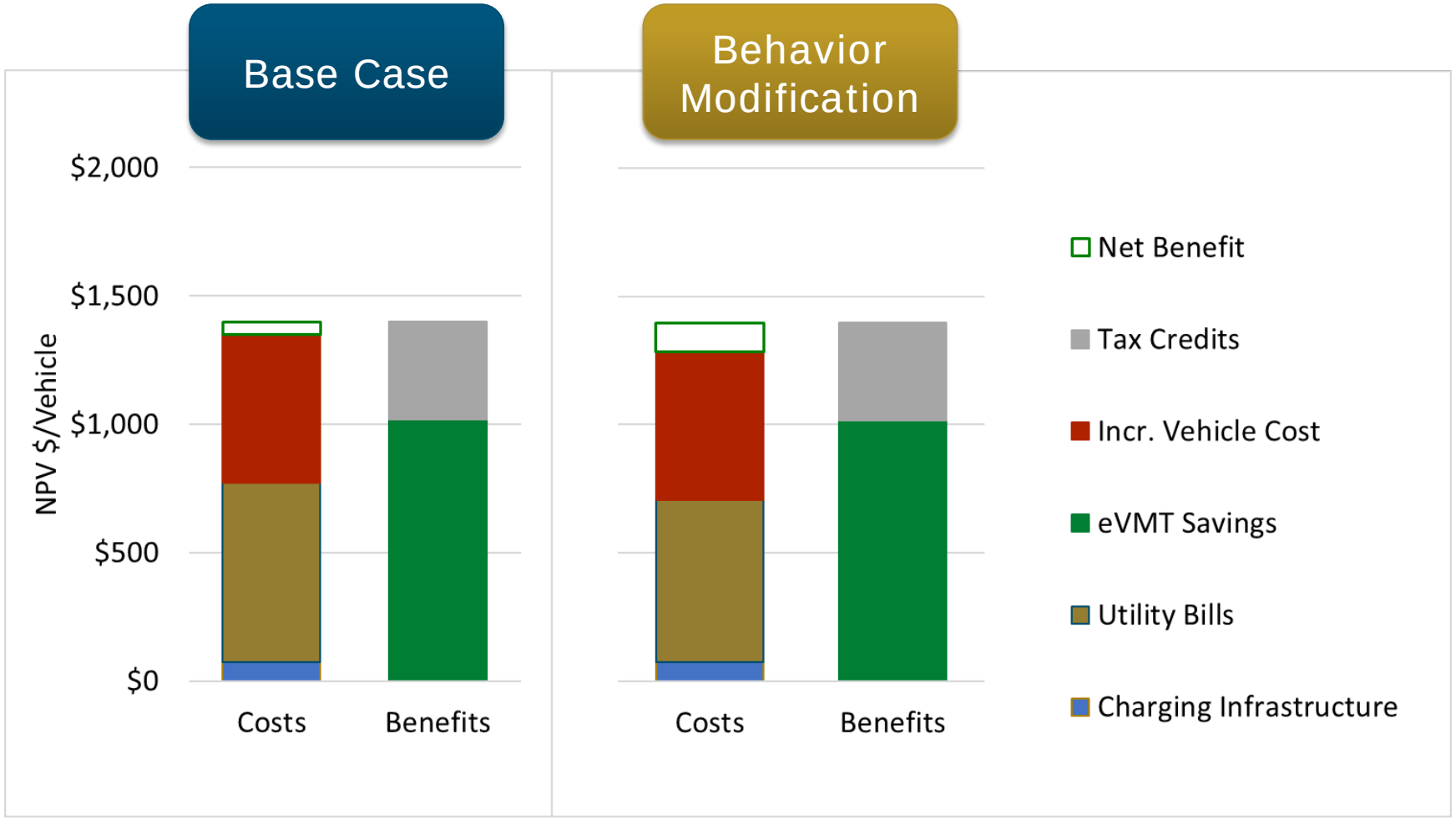




Reduced capacity and energy costs yield net benefits

Preliminary results for single utility

Driver benefits



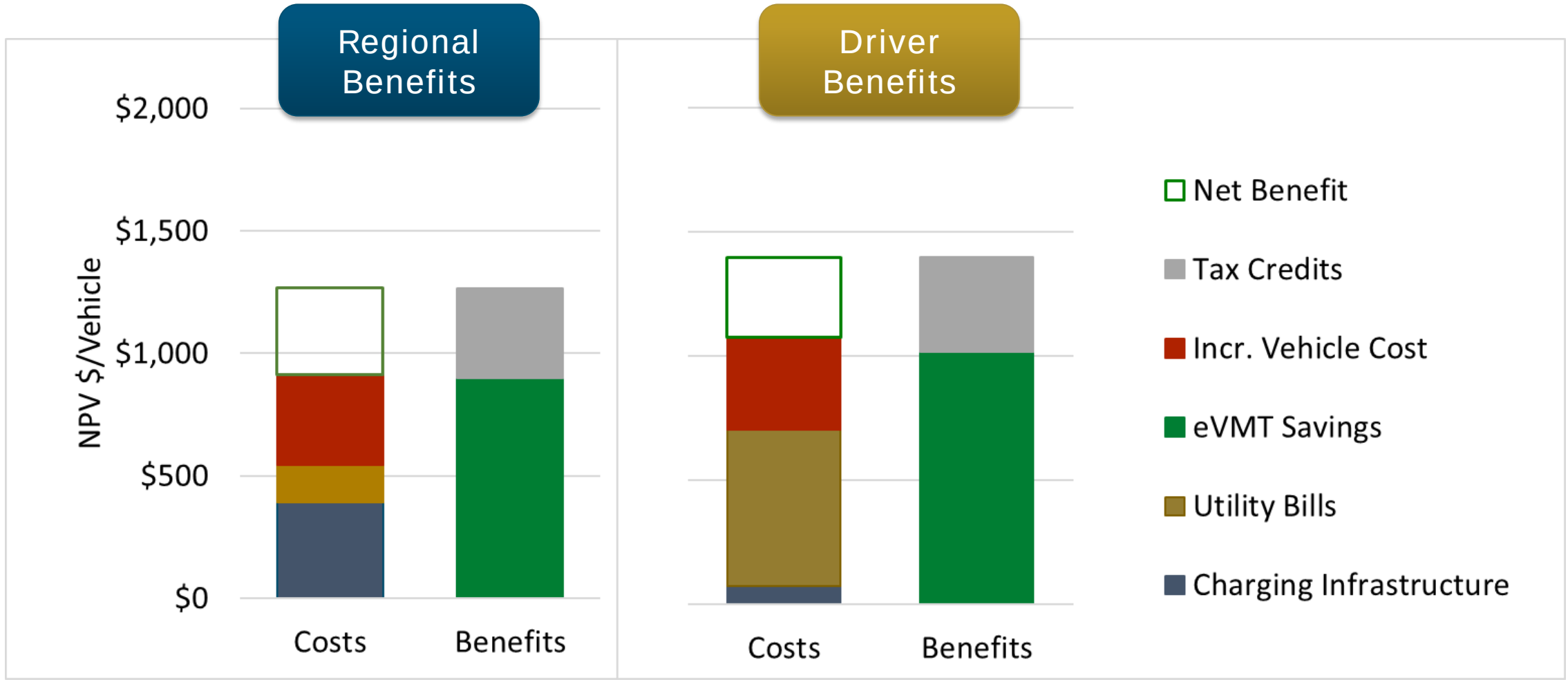
+Positive total cost of ownership

+Biggest levers

- Lower vehicle cost
- Lower cost of charging

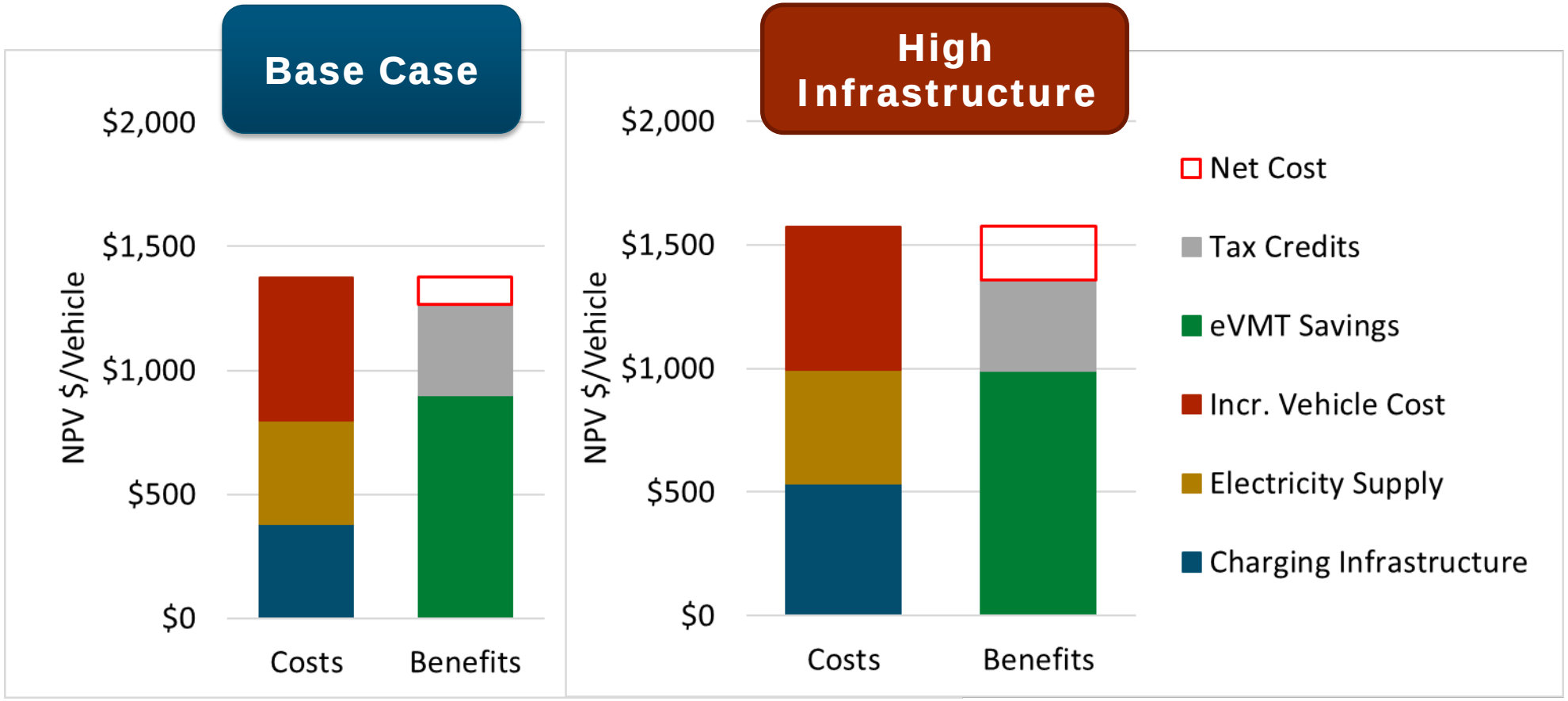
Preliminary results for single utility

Lower vehicle cost projections increase net benefits significantly



Preliminary results for single utility

Illustrative High Infrastructure case: assumes more public fast and L2 chargers increase eVMT



Case for high infrastructure: more PEV sales and more eVMT

Preliminary results for single utility

Findings and recommendations

- Even with declining vehicle prices, cost to driver must be reduced, *especially as federal tax credit sunsets*
- Need to better understand charging behavior - and how to influence it
- What is more important for infrastructure: low cost or high value for drivers?
- How best to meet charging needs of shared and driverless vehicles?

+ Thank You

eric@ethree.com
415-391-5100