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July 6, 2016

MEMORANDUM

TO: Council members

FROM: Massoud Jourabchi, Manager, Economic Analysis

SUBJECT: Presentation on Seattle City Light Electric Vehicle Programs

BACKGROUND:

Presenter: Brendan O'Donnell, Energy Planning Supervisor, Seattle City Light

Summary Mr. O'Donnell will discuss the current state of Seattle City Light's Electric Vehicle programs and their impact.

Workplan: B.3.1 Enhance Modeling of Electrification of Transport System

Background: See: <http://www.seattle.gov/light/electric-Vehicles/>



TRANSPORTATION ELECTRIFICATION

BRENDAN O'DONNELL





Seattle aims to be carbon neutral by **2050**

Carbon neutrality requires a rapid transition from fossil fuels in the **transportation sector**

Building on the legacy of Seattle City Light by leveraging **clean electricity**

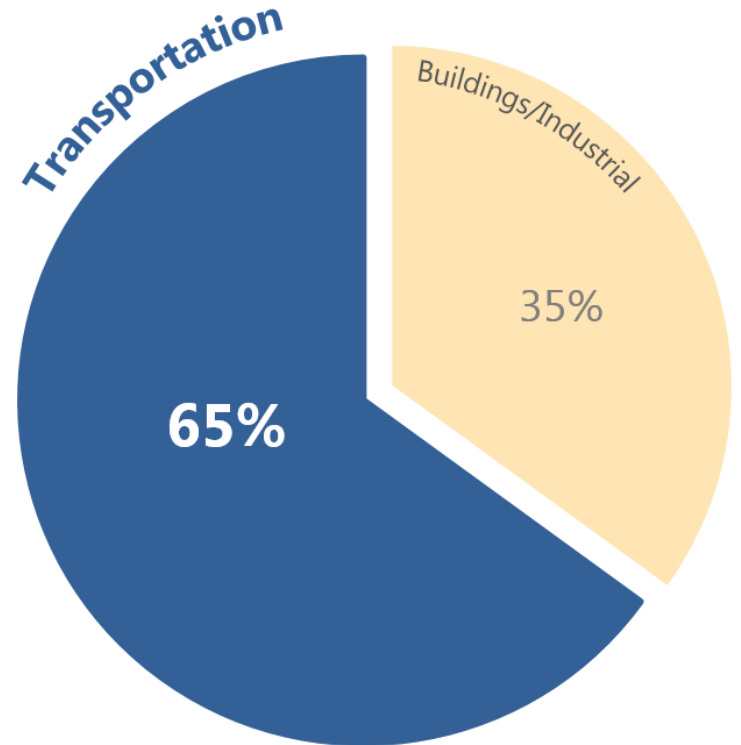
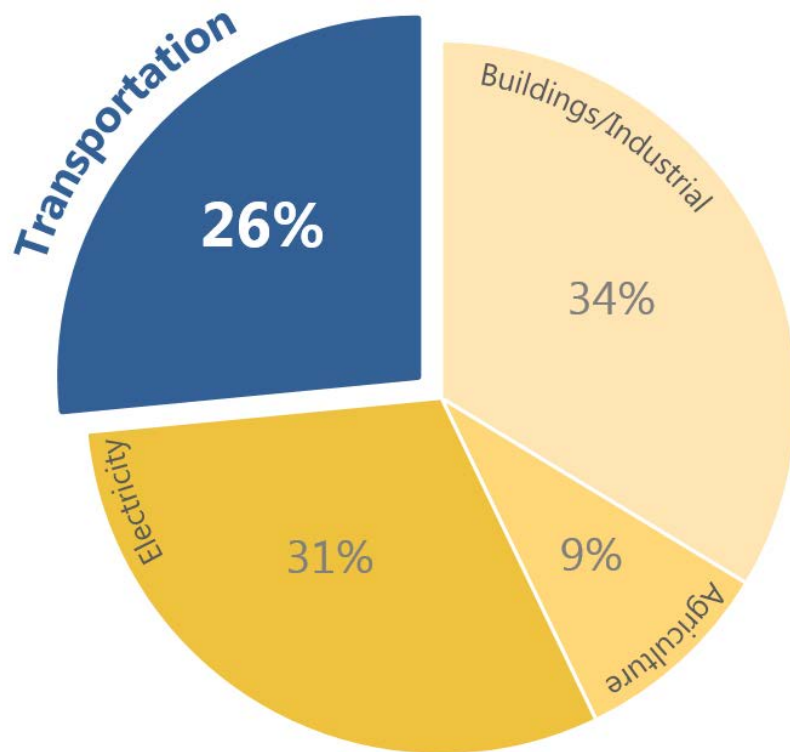
CARBON EMISSIONS

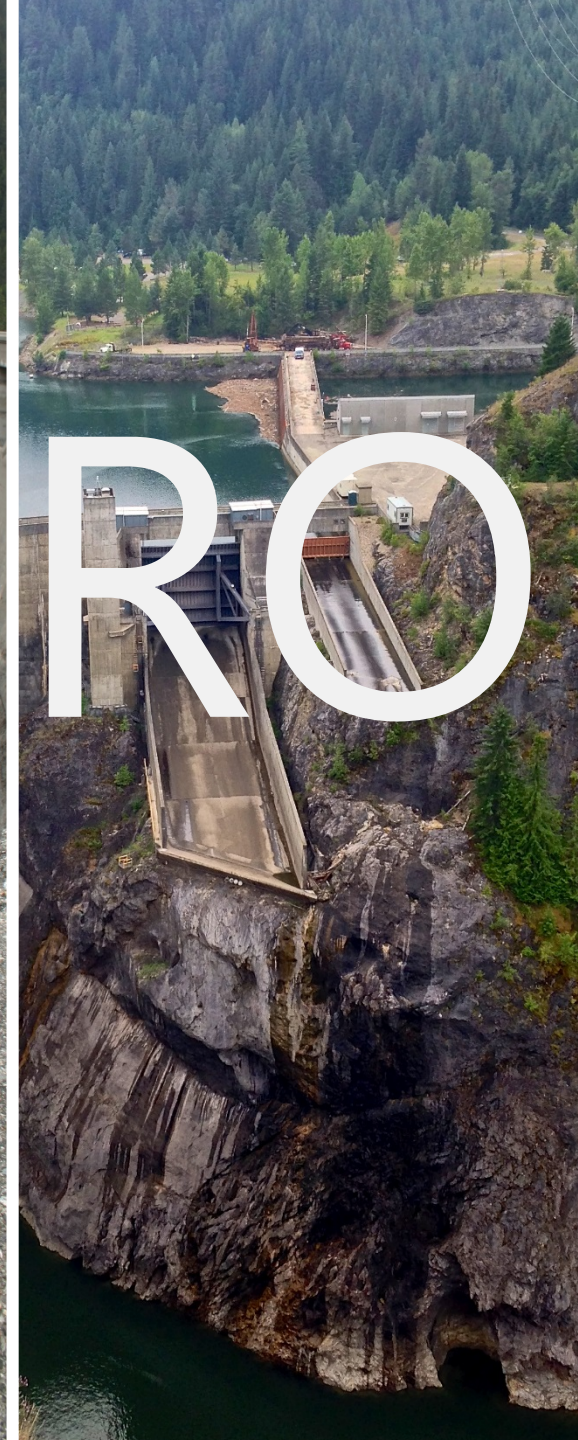


US AVERAGE



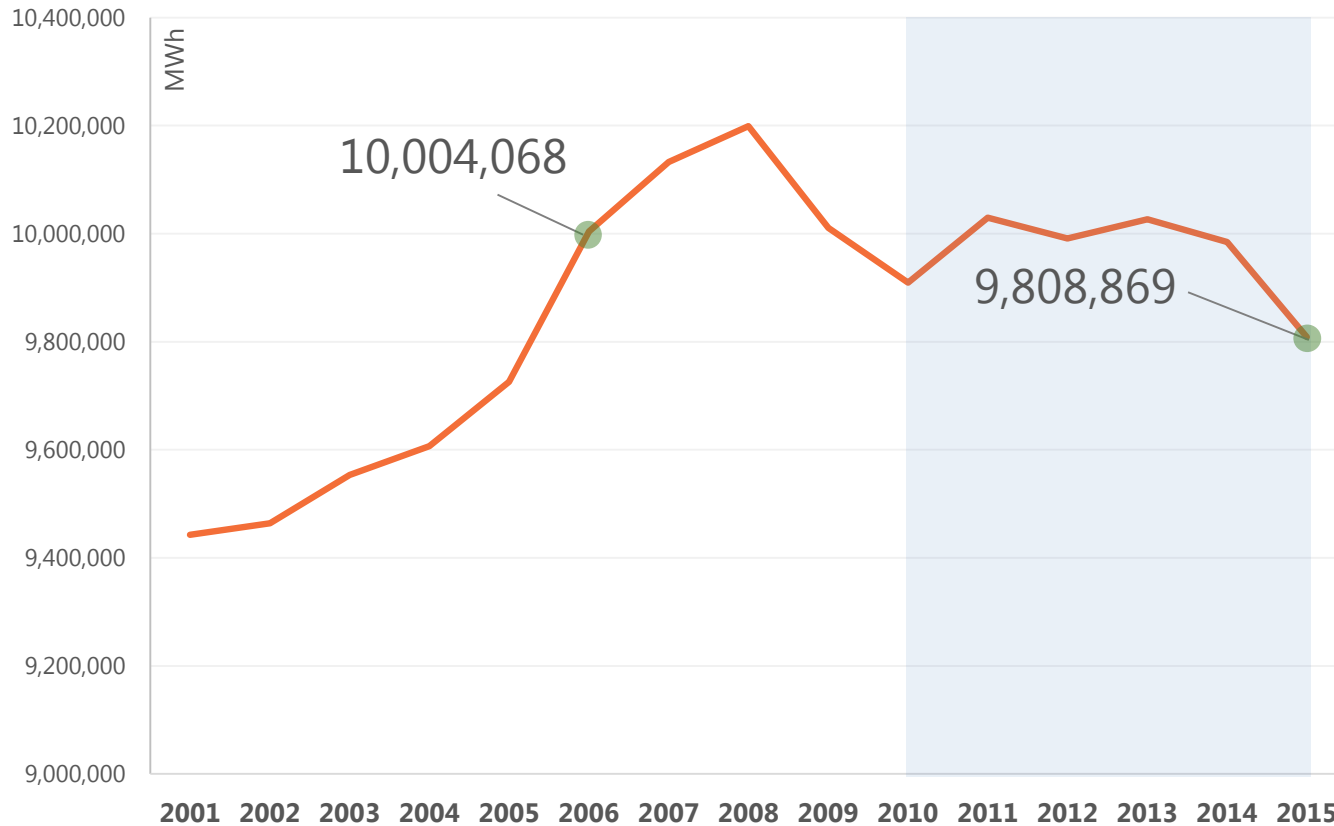
SEATTLE





ANNUAL LOAD

weather adjusted



EVs IN SEATTLE

- Tremendous EV growth in Seattle
 - 3rd largest market of U.S. cities₁
 - However, this is with comparatively little utility or government push
- Large opportunity
 - City's Light's low carbon resource
 - Inexpensive energy rates
 - Motivated customers



TE STRATEGY DEVELOPMENT



STRATEGY GOALS

- 1 What is the value of transportation electrification to our customers?
- 2 How will our distribution system be affected by the increased load?
- 3 What role should City Light take in advancing transportation electrification?



PROJECT TEAM



Brendan O'Donnell
PROJECT MANAGER



Carsten Croff
FINANCE



Oradona Landgrebe
ENVIRONMENTAL AFFAIRS



Rose Feliciano
LEGISLATIVE AFFAIRS



Margo Dannemiller
MARKETING & COMMUNICATIONS



Dan Langdon
CUSTOMER CARE



Robert Downes
LOAD FORECASTING



Laurie Hammack
DISTRIBUTION PLANNING

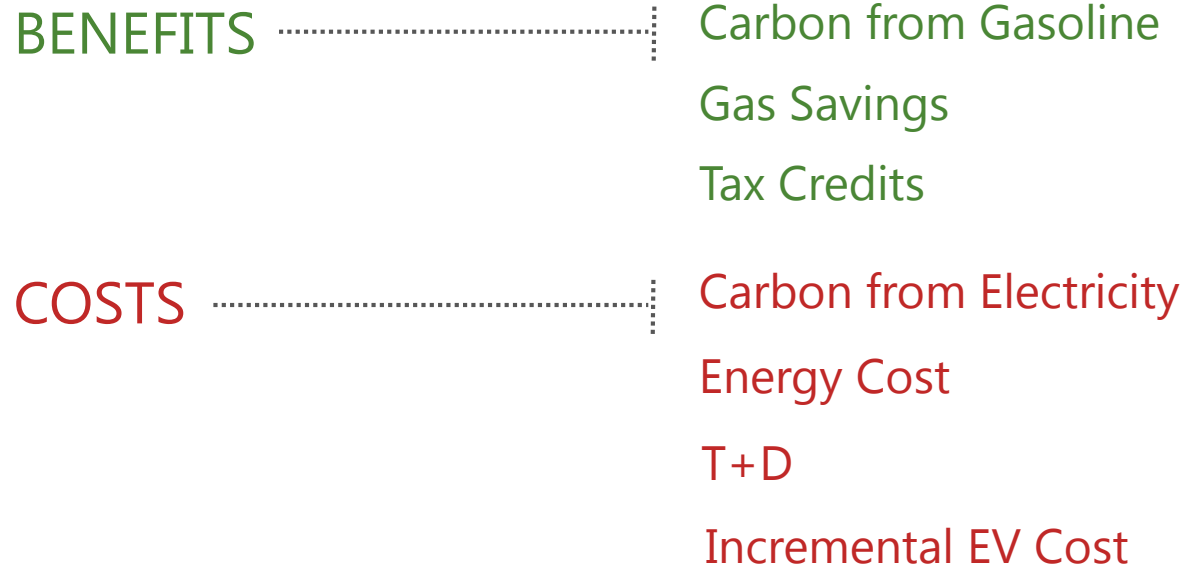
FINDINGS

- There is a net benefit for vehicle charging
 - Cars, buses and forklifts
- Encouraging adoption creates additional value
 - Accelerating EV adoption 25% by 2030 will add an additional \$58 million of ratepayer value.
- The distribution system can largely handle the increase in transportation load
 - 80% of feeders can add at 550+ EVs without additional capacity
- Strong customer demand, particularly electrification of our transportation sector in socially responsible ways.

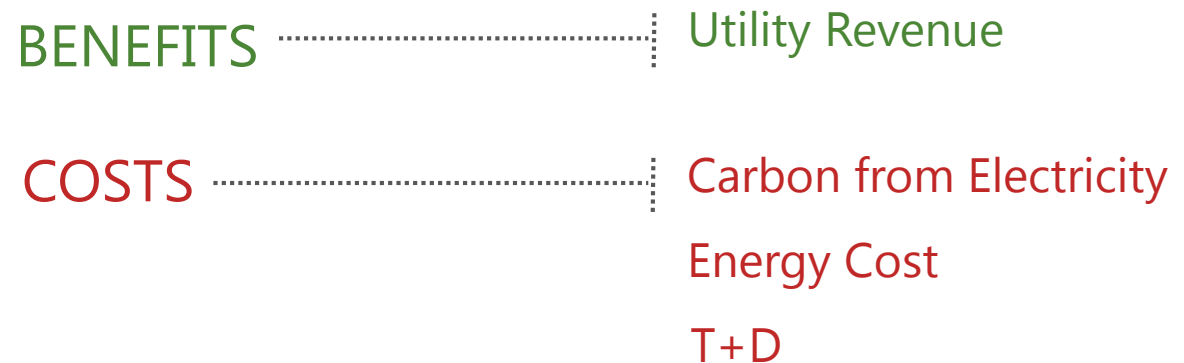
BENEFIT COST RESULTS



TOTAL RESOURCE COST [TRC]

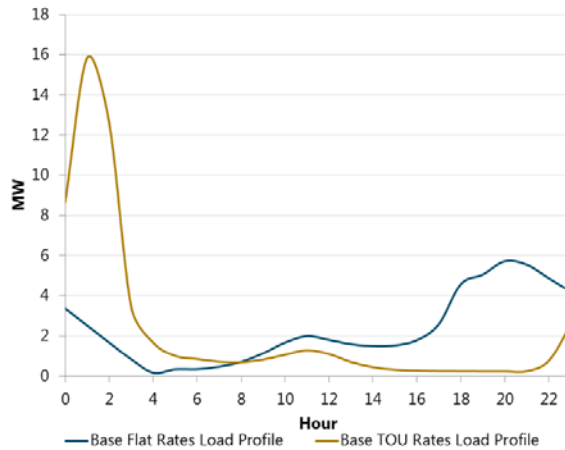


RATEPAYER IMPACT MEASURE [RIM]

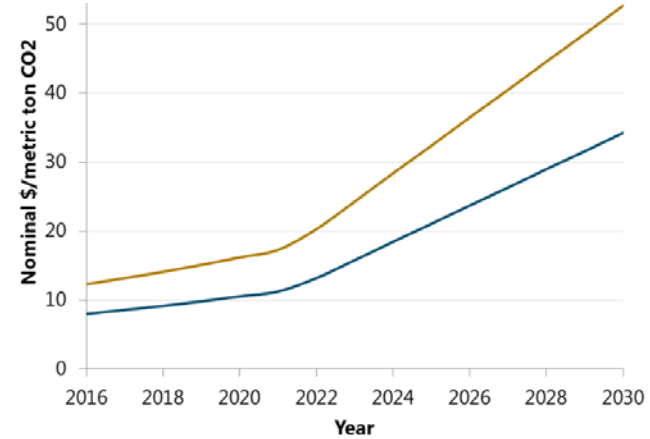


INPUTS

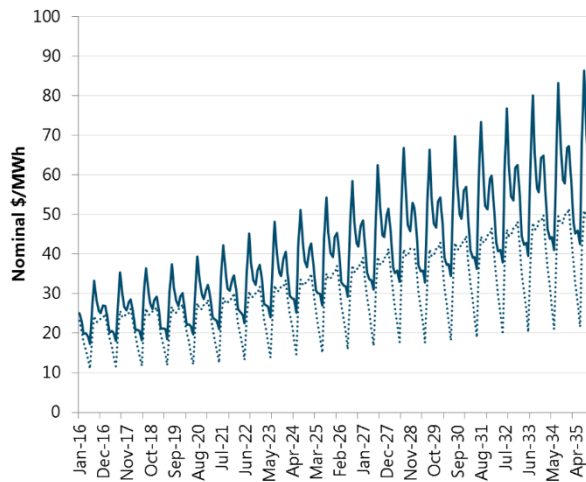
Daily Charging Shape



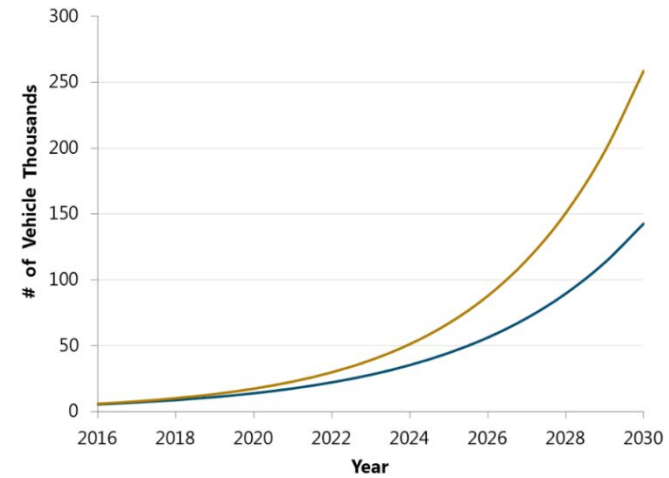
Carbon Price



Energy Price

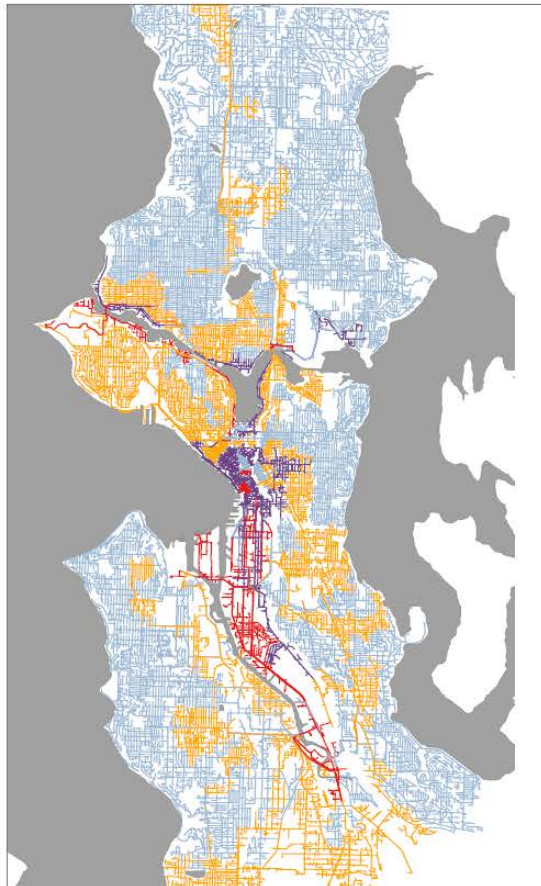


Vehicle Adoption



CHARGING DISTRIBUTION

CHARGING PROFILE



Workplace
and Bus
Charging

0%-0.25%

0.26%-0.5%

0.6%-1%

1.1% +

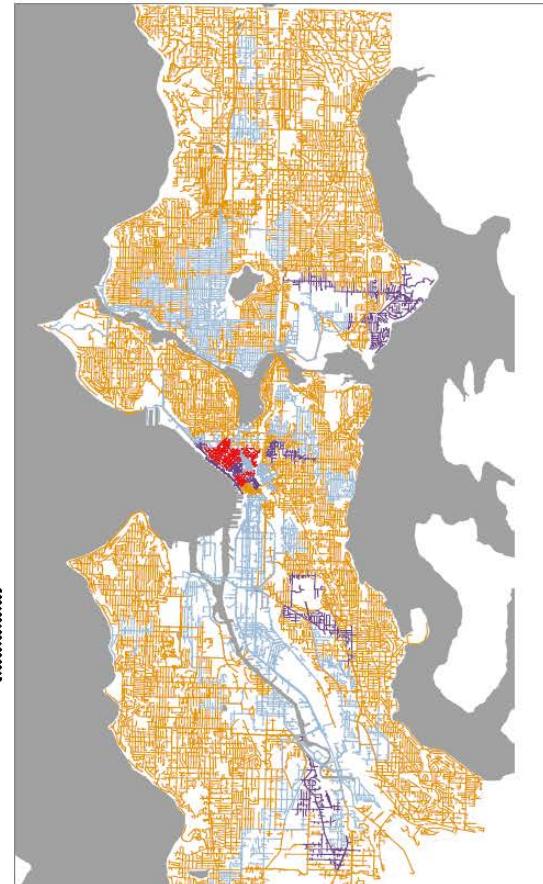
Residential
Charging

0%-0.5%

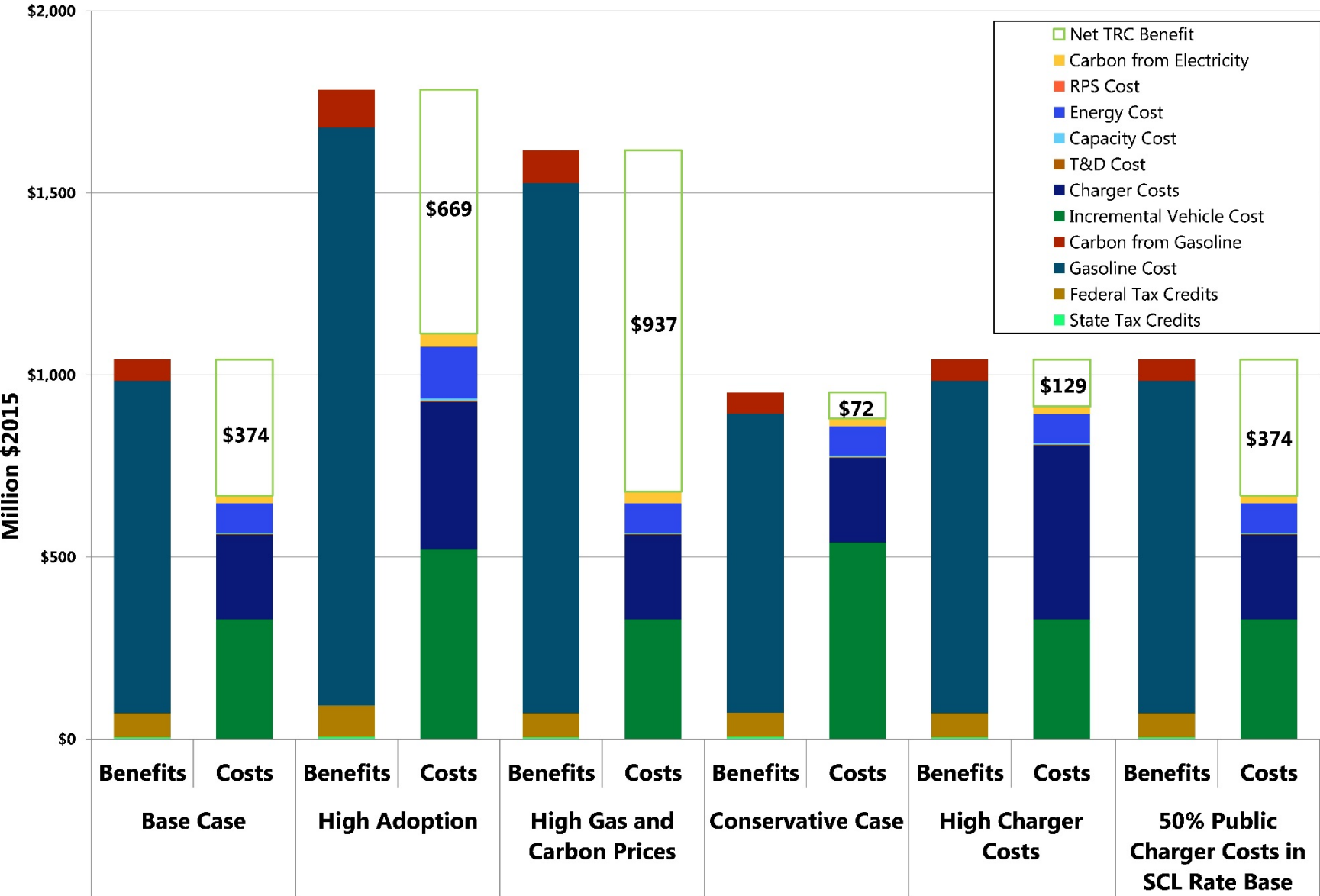
0.6%-1%

1.1%-1.5%

1.5% +

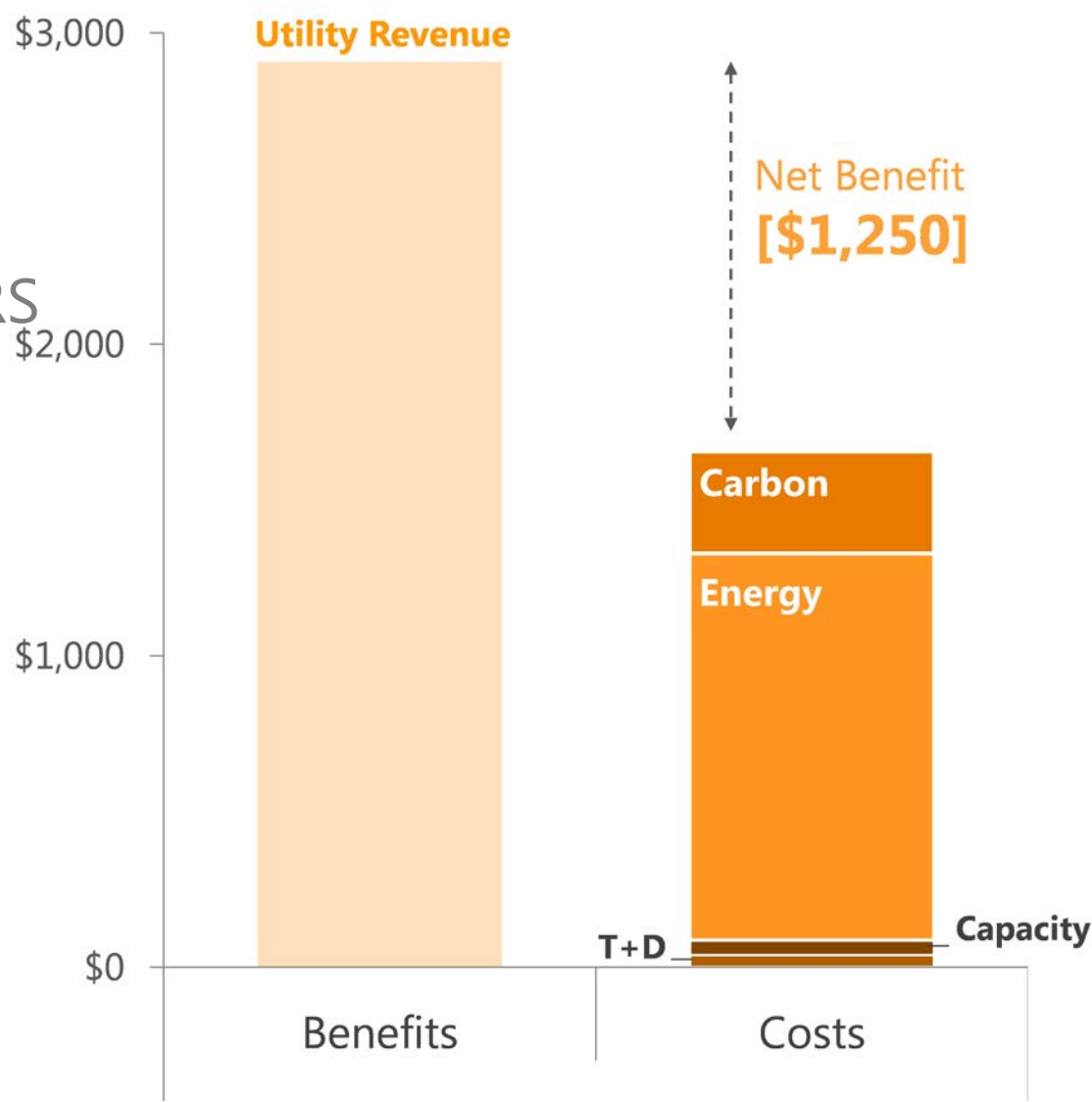


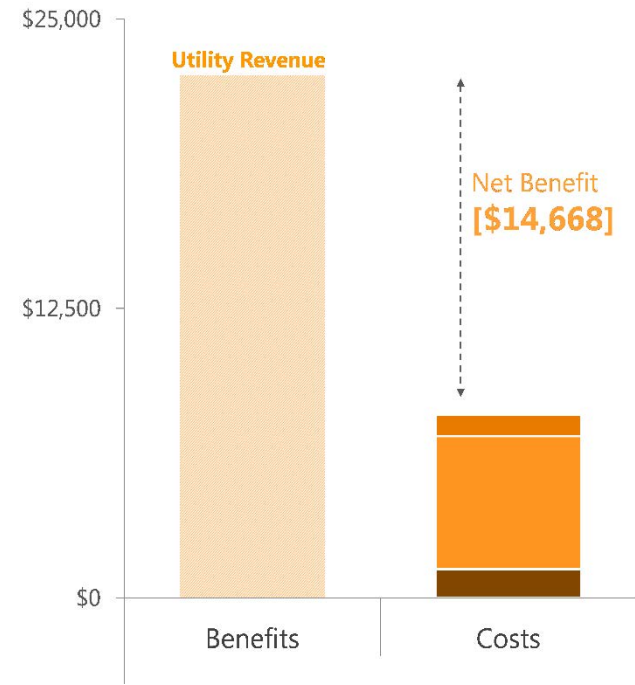
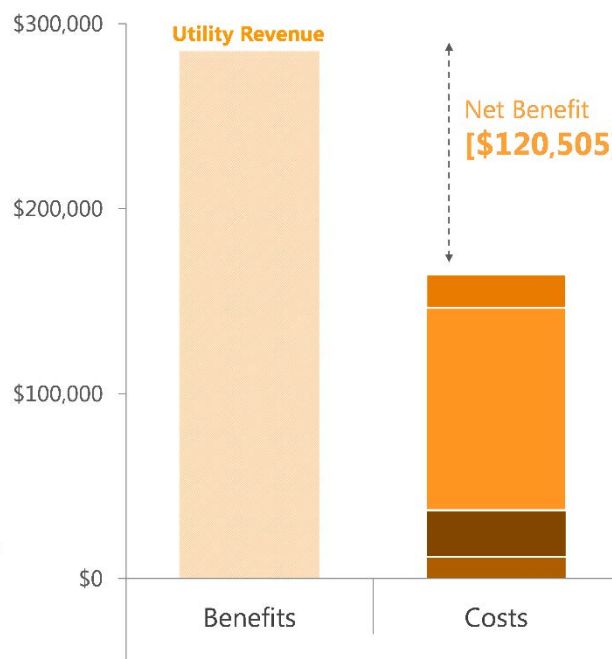
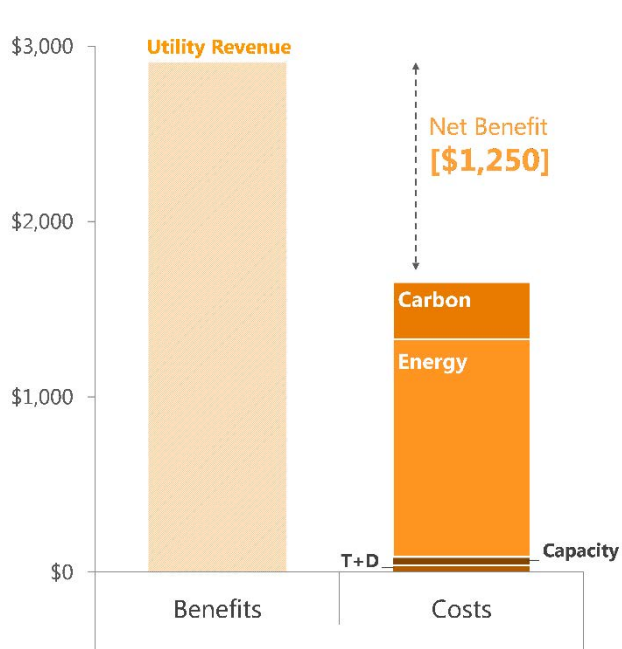
TOTAL RESOURCE COST [TRC]





CARS

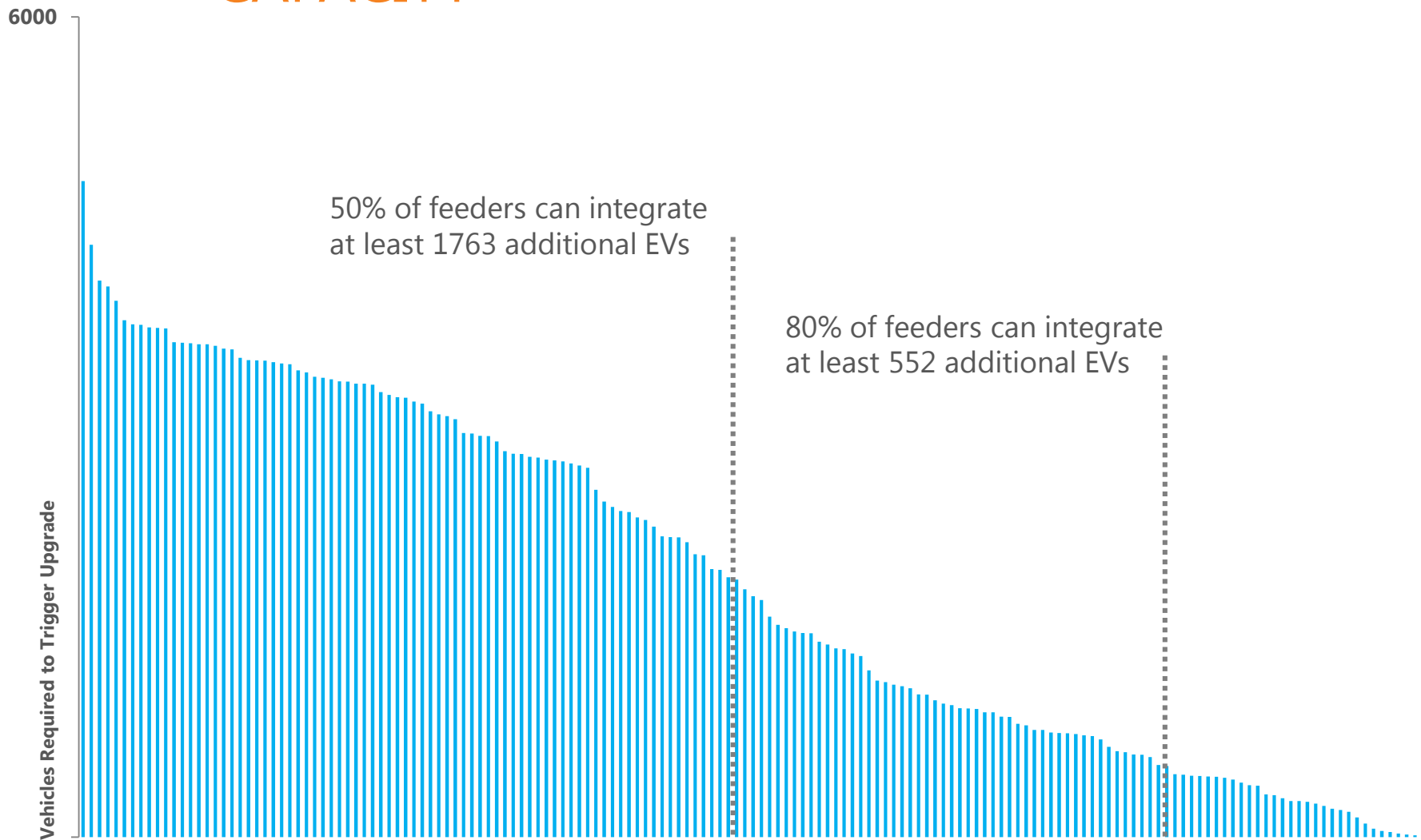




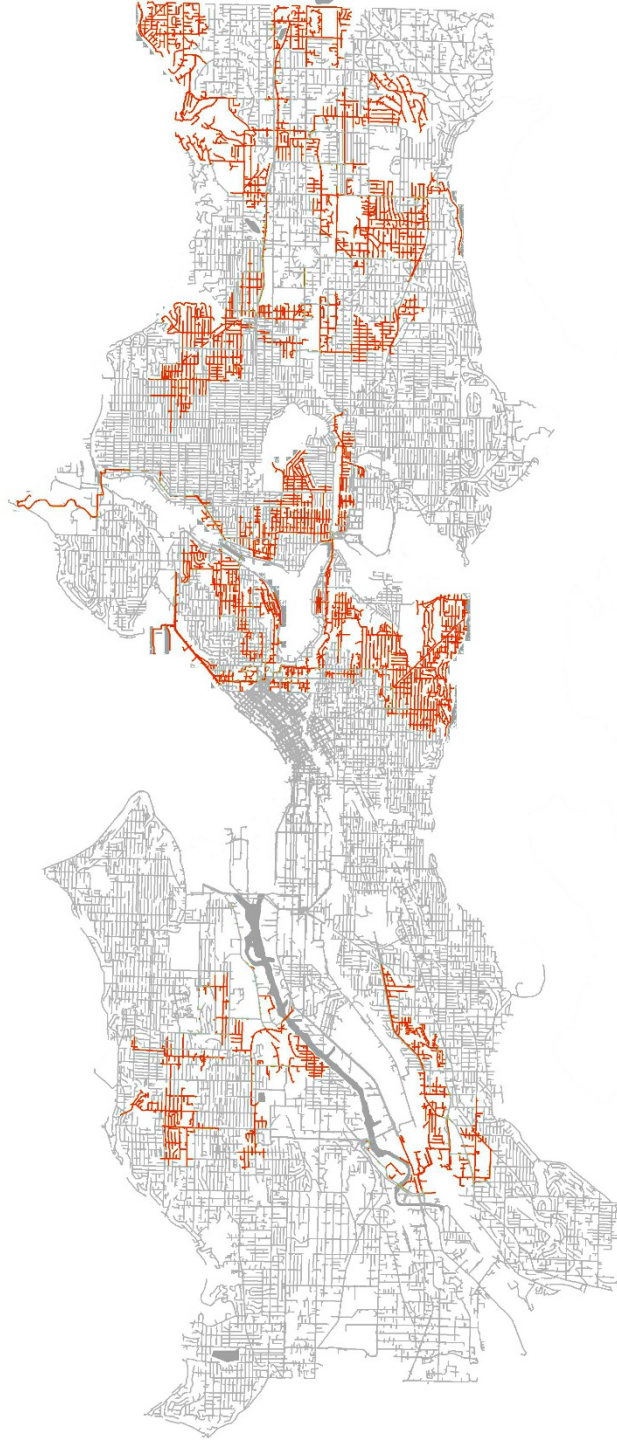
GRID ANALYSIS



AVAILABLE FEEDER CAPACITY



DISTRIBUTION IMPACTS



PROGRAM ROADMAP





EV PROGRAM OPTIONS

SEATTLE CITY LIGHT



EV Time-of-Use rates



Utility Make Ready investments



Private charging stations at homes and businesses



Vehicle incentives



Develop public charging networks



Electric transit and non-road transportation



Education and outreach



NEXT STEPS

1

Public DC Fast Charging Pilot

- o 20 City Light owned stations starting in 2017

2

Residential Charging Pilot

- o Charging service with focus on grid services

3

Clarify State Legislative Authority

- o Allow greater flexibility in program design



CITY LIGHT

OUR VISION

To set the standard—to deliver the best customer service experience of any utility in the nation.

OUR MISSION

Seattle City Light is dedicated to exceeding our customers' expectations in producing and delivering environmentally responsible, safe, low-cost and reliable power.

OUR VALUES

Excellence, Accountability, Trust and Stewardship.

