



# Sustainability Goal

PSTA Board Meeting

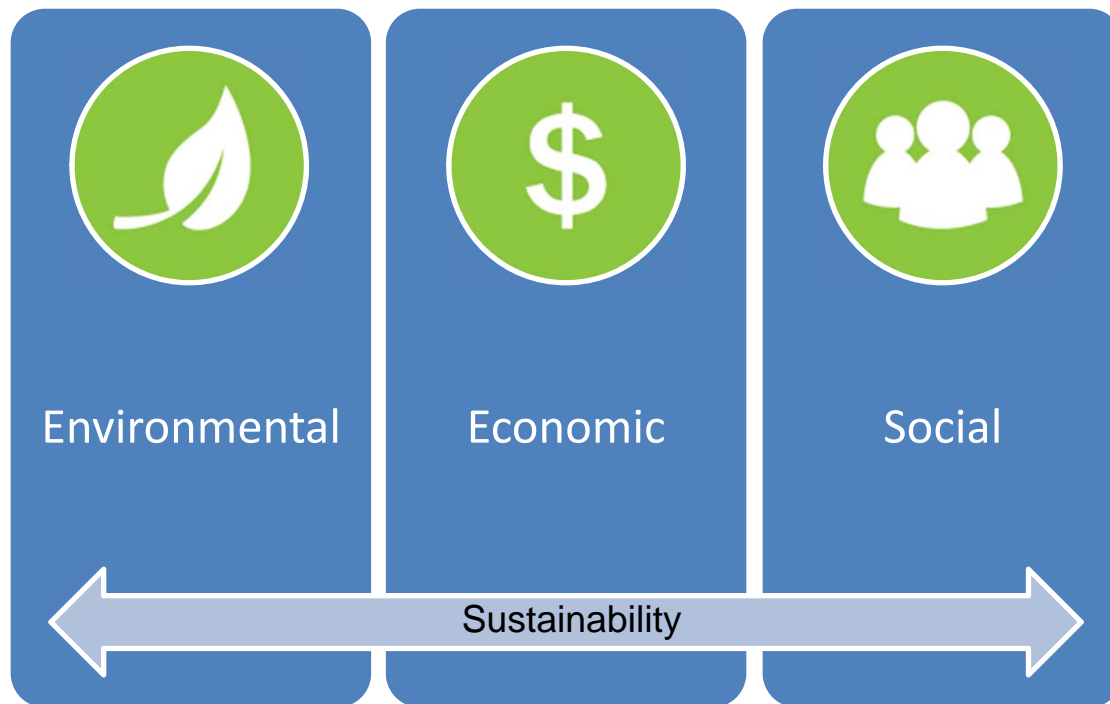
May 25, 2016

Pinellas Suncoast Transit Authority

St. Petersburg, Florida

# What is Sustainability?

- Responsibility in organizational decision making
  - Environmental, Economic, and Social
  - Meet needs of today without compromising ability to meet future needs



## PSTA Is A Large Transportation Network

Type	Fuel Type	Quantity	Total Metric Tons GHG Emissions/Yr
PSTA Diesel (2001-2009)	Diesel	141	17,978
PSTA Hybrids (2009-2015)	Diesel	61	6,222
PSTA Small (2012)	Unleaded	8	238
PSTA Cars (2006-2010)	Unleaded	15	134
PSTA Cars-Hyb (2002-2014)	Unleaded	21	125
PSTA Trucks (1997-2016)	Unleaded	12	142
PSTA Trucks (2006-2012)	Diesel	4	54
DART Sedans	Unleaded	100	1,781
DART Vans	Unleaded	60	1,069
Jolley Trolley	Unleaded	17	303
Jolley Trolley	Diesel	7	179
Jolley Trolley	CNG	1	15
Looper Group	Unleaded	4	71
Looper Group	Diesel	3	77
<b>Totals</b>		<b>454</b>	<b>28,386</b>

# Sustainable Capital Program



Replace old diesel buses = improved fuel economy and reduced emissions



Long-term, flexible sustainable fleet replacement plan



Maintain service levels and reliability and incrementally expand service



## Increased Fuel Economy Is Sustainable Policy

- Replacing oldest buses improves fleet fuel economy and reduces emissions

	BASELINE		FUTURE SCENARIOS		
Fleet	Current	7 new BAEs	35 new diesels	35 new BAEs	35 new electrics
Year	2016	2017	2020	2020	2020
# of Vehicles	210	210	210	210	210
<b>Fleet MPGE</b>	<b>4.45</b>	<b>4.60</b>	<b>4.68</b>	<b>5.04</b>	<b>6.42</b>
Total GHG Emissions/Fleet (Metric Tons/year)	24,438	24,094	22,176	21,268	18,762
% reduction in emissions		-1.41%	-9.26%	-12.97%	-23.23%
% increase in fuel economy		3.30%	5.09%	13.17%	44.18%

## PSTA's Financial Sustainability

- PSTA must be both the most environmentally sustainable as well as financially sustainable.
- PSTA Can Not Afford to Commit to a Single Vehicle Technology:



# Financial Comparisons - Verified

## Initial Capital Cost

	Diesel (40')	BAE (40')	CNG (40')	Proterra (40')
Number of Buses	1	1	1	1
Cost of Base Bus	\$388,963	\$388,963	\$388,963	\$749,000
Turn-Key Costs	\$86,842	\$308,962	\$140,225	\$122,640
Capital Infrastructure Costs	\$0	\$0	\$3,000,000	\$589,000
Training Costs	\$0	\$0	\$57,000	\$18,000
Tooling Costs	\$0	\$0	\$20,000	\$7,000
<b>Total Cost</b>	<b>\$475,805</b>	<b>\$697,925</b>	<b>\$3,606,188</b>	<b>\$1,485,640</b>

## Life Cycle Costs - \$1.88 per Gallon

Qty (1) Bus	Diesel (40')	BAE (40')	CNG (40')	Proterra (40')
Cost of Base Bus	\$388,963	\$388,963	\$388,963	\$749,000
Turn-Key Costs	\$86,842	\$308,962	\$140,225	\$122,640
Capital Infrastructure Costs*	\$0	\$0	\$3,000,000	\$589,000
Training	\$0	\$0	\$57,000	\$18,000
Tooling	\$0	\$0	\$20,000	\$7,000
Fuel**	\$282,000	\$188,000	\$260,454	\$30,698
Maintenance Costs***	\$204,000	\$222,000	\$246,000	\$174,000
<b>Total (Current \$)***</b>	<b>\$961,805</b>	<b>\$1,107,925</b>	<b>\$4,112,642</b>	<b>\$1,690,338</b>

# Verification



## **Foothill Transit Battery Electric Bus Demonstration Results**

Leslie Eudy, Robert Prohaska, Kenneth Kelly,  
and Matthew Post  
National Renewable Energy Laboratory



of the U.S. Department of Energy  
& Renewable Energy  
of Sustainable Energy, LLC  
cost from the National Renewable Energy  
rel.gov/publications.

TRANSIT  
COOPERATIVE  
RESEARCH  
PROGRAM

Sponsored by  
the Federal  
Transit Administration

**TCRP**  
REPORT 146

**Guidebook for Evaluating  
Fuel Choices for Post-2010  
Transit Bus Procurements**

TRANSPORTATION RESEARCH BOARD  
OF THE NATIONAL ACADEMIES

## Maintenance Costs Similar

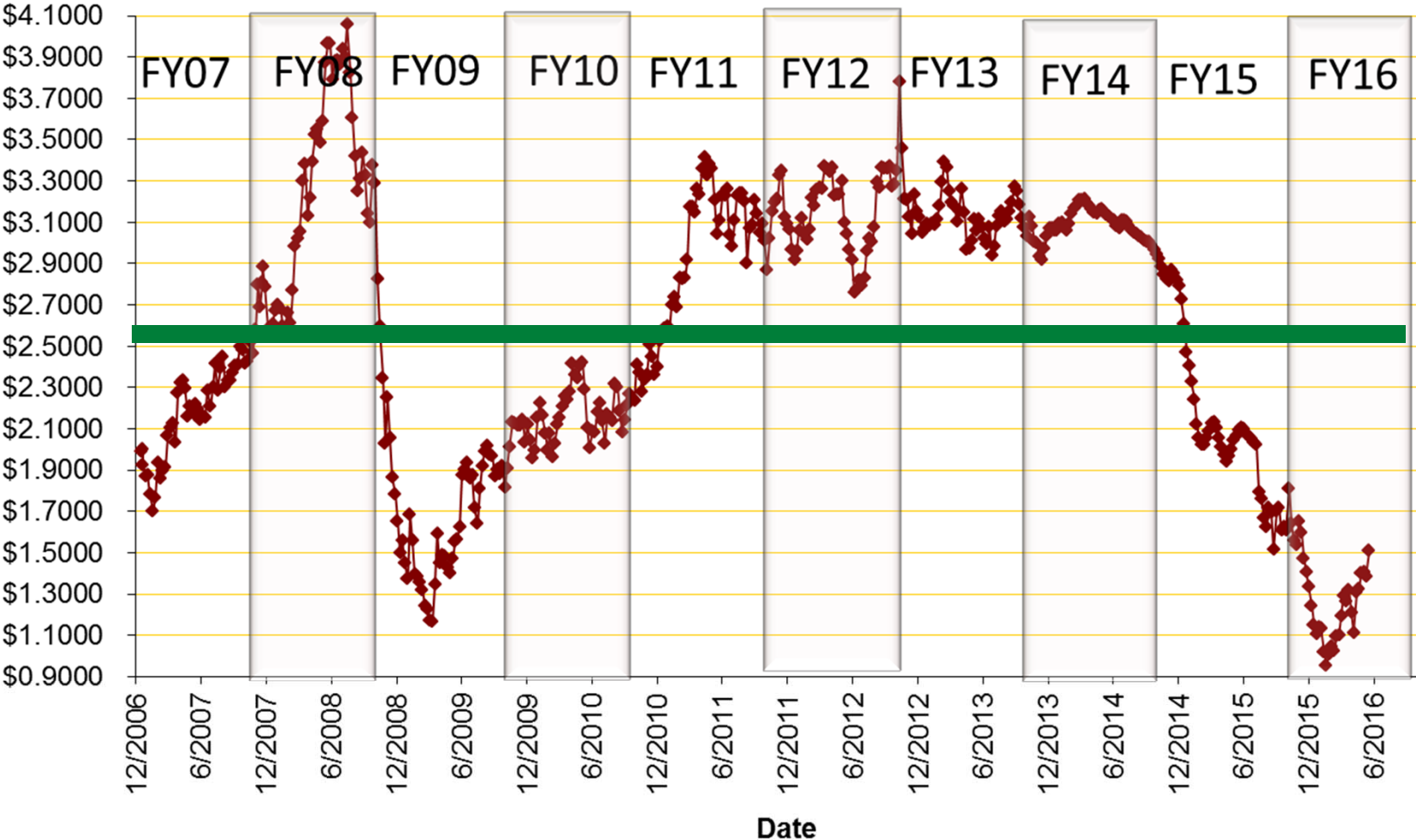
- 2016 US DOE Study of Foothill Transit Proterra Buses
- 2011 National TCRP Report 146

## Leasing Options Proposed

- No Proterra Bus or battery system has been leased to date.
- Leasing not proposed for capital infrastructure.
- PSTA has requested a formal quote but leasing unlikely to be lower cost than buying.



# ULSD Diesel #2 Fuel Price Per Gallon Trend



# Financial Comparisons - Verified

## Life Cycle Costs - **2 Buses** \$2.55 per Gallon/BP-Funded Charger

Qty (2) Bus	Diesel (40')	BAE (40')	CNG (40')	Proterra (40')
Cost of Base Bus	\$777,926	\$777,926	\$777,926	\$1,498,000
Turn-Key Costs	\$173,684	\$617,924	\$280,450	\$245,280
Capital Infrastructure Costs*	\$0	\$0	\$3,000,000	\$240,000
Training	\$0	\$0	\$57,000	\$18,000
Tooling	\$0	\$0	\$20,000	\$7,000
Fuel**	\$765,000	\$510,000	\$520,909	\$61,395
Maintenance Costs***	\$408,000	\$444,000	\$492,000	\$348,000
<b>Total (Current \$)***</b>	<b>\$2,124,610</b>	<b>\$2,349,850</b>	<b>\$5,148,285</b>	<b>\$2,417,675</b>

## Life Cycle Costs – **10 Buses** \$3.30 per Gallon/BP Funded Charger

Qty (2) Bus	Diesel (40')	BAE (40')	CNG (40')	Proterra (40')
Cost of Base Bus	\$3,889,630	\$3,889,630	\$3,889,630	\$7,490,000
Turn-Key Costs	\$868,420	\$3,089,620	\$1,402,250	\$1,226,400
Capital Infrastructure Costs*	\$0	\$0	\$3,000,000	\$949,000
Training	\$0	\$0	\$57,000	\$18,000
Tooling	\$0	\$0	\$20,000	\$7,000
Fuel**	\$4,950,000	\$3,300,000	\$2,604,545	\$306,977
Maintenance Costs***	\$2,040,000	\$2,220,000	\$2,460,000	\$1,740,000
<b>Total (Current \$)***</b>	<b>\$11,748,050</b>	<b>\$12,499,250</b>	<b>\$13,433,425</b>	<b>\$11,737,377</b>

# Financial Sustainability

## Public Transportation Service Relies on Regular Bus Replacements

- **70 New Replacement Buses Needed in Next 5 Years**

No.	Replacement Strategy	Replacements Purchased Over Next 5 Years	Reliable Buses in 2021
1	Current	210	210
2	No Replacements	0	140
<b>3</b>	<b>Mix/ Diesels</b>	<b>70</b>	<b>210</b>
4	All BAE Hybrids	37	173
5	All Electrics	35	165-170* (*2 <sup>nd</sup> Set of Charging Stations Not Fully Online by 2021)
6	All CNG	35 Other/25 CNG	170-200* (*3-4 Years to Install CNG Fueling Station)
7	COMBO	36-69	165-209



# Transit Service Helps Environment

Annual PSTA Bus GHG Emissions (Metric Tons)	Annual Ridership	Car Driving Emission Reductions (Tons)	Net Environmental Benefit PSTA Offers
24,100	14,000,000	-25,719	-1,619 Tons of GHG Emissions Per Year

# How PSTA is Sustainable

**Providing Citizens with a Public Transit Option is the Most Environmentally Sustainable Thing PSTA Does By Far**

No.	Decision	2017 Fuel Economy	2021 Fuel Economy	Reliable Buses in 2021	2021 PSTA Net GHG Emissions	Notes
1	Baseline	4.45		210	-1,619 Tons/Yr.	483 Vehicles, 43,000 Transit Trips Per Day
2	No Vote	4.0	3.5	140	-1,425 Tons/Yr.	Buses Age, Break Down, 10% Ridership Reduction
<b>3</b>	<b>Mix/ Diesels</b>	<b>4.6</b>	<b>4.7</b>	<b>210</b>	<b>-3,600 Tons/Yr.</b>	<b>Balanced Fleet, Ridership Maintained/Increased</b>
4	All Hybrids	4.3	5.0	173	-2,700 Tons/Yr	Service Cuts Possible, Ridership Drop
5	All Electrics	3.9	6.4	165-170	-2,000 Tons/Yr.	Major Cuts Possible, Major Ridership Drop
6	All CNG	3.9	3.8	200 – only some CNG	-1,550 Tons/Yr.	Small Cuts Possible, Small Ridership Drop

# Need to Expand Services

- Newspaper Editorials/Other
- Increasing Ridership via New Services & Reducing Car Usage will be Best Way for Pinellas to Improve Environment



INDUSTRY NEWS - LOGISTICS & TRANSPORTATION  
**Pinellas bus system sets ridership record expansion in service**  
 Nov 23, 2014, 11:22am EST  
 INDUSTRIES & TAGS: Logistics & Transportation, Funding, Economic Snapshot



## Sustainable Recommendation

- Adopt a Goal to Improve PSTA's Fleet Fuel Economy Every Year to Maximize Net Emission Savings.
  - Approve continuing to purchase a mixed fleet including diesel, and hybrid-BAE technologies.
  - Continue to Apply for Every Possible Federal, State, & Local Grant to Upgrade Fleet Purchases.
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- Consider Comprehensive Annual CIP Vote rather than separate bus orders each year. (Authorize CEO to Make Contracted Purchases based on Adopted CIP.)

**4.6 MPG**