



Sustainable Operations

Joseph M. Casey, General Manager
Presentation to:
MetroRail Conference
March 24, 2012

- 6th Largest U.S. Transit Agency
- Population: 4 Million Residents
- Coverage Area: 2,200 Miles
- Ridership: 1 Million Daily (300 Million Annually)
- Employees: 9,200
- Vehicles: 2,550
- Fixed Routes: 144



SEPTA Service Profile

SEPTA Regional Rail & Rail Transit



Broad Street Subway: 123



Commuter Rail: 357



Light Rail: 160



Market-Frankford Sub/EI: 220



Historic Streetcar: 25



Bus & Trolley Bus: 1,667



Multi-Modal Fleet of 2,550 Vehicles

Strategic Objectives

- Customer Service
- Ridership Growth for Transit
- Safety & Security
- Human Capital Development
- Rebuilding the System
- New Technologies
- Sustainability

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY

Partnering for Regional Sustainability



Fiscal Years 2010 – 2014 Five-Year Strategic Business Plan



Strategic Business Plan (March 2009)
Partnering for Regional Sustainability



SEP-TAINABLE: THE ROUTE TO REGIONAL SUSTAINABILITY

JANUARY 2011

**SEP-TAINABLE: Award-Winning
Sustainability Program Plan: (Jan. 2011)**

SEP-TAINABLE GOING *Beyond* GREEN



SEP-TAINABLE:
Annual Report (Jan. 2012)

ENVIRONMENTAL

- Reduce Resource Consumption
- Reuse Resources That Are Consumed
- Recycle Resources That Cannot Be Reused

SOCIAL

- Support Livable, Sustainable Communities
- Promote Social Equity
- Develop a Healthy & Versatile Workforce

ECONOMIC

- Business Case for Sustainability
- Achieve Fiscal Stability
- Catalyze Growth & Development

Triple Bottom Line Approach

- 472 Hybrid-Electric Buses (1/3 of Fleet)
 - Another 200+ by 2014
- Benefits of Incremental Capital Investment:
 - Fuel Efficiency (40%)
 - Extended Useful Life (15 vs. 12 Years)
 - Maintenance Savings
 - Improved Acceleration
 - Smoother, Quieter Operation



Key Sustainability Initiatives: Hybrid Buses

- All Electric Propulsion-Based Rail Services Capable of Regenerative Braking
- New Silverliner V Railcars with Higher “Power Factor” = Better Regen Capacity
- Propulsion Control Retrofit on Broad Street Subway to Enable Regen Recapture – Will Pay for Itself in Less Than Two Years

Cost-Benefit Analysis of BSS Propulsion Control Retrofit	Cost	Benefit
Upfront Cost	\$1.7M	
Annual Benefit		\$1.5M
<i>30% Reduction in Traction Motor Failures</i>		<i>\$86,534</i>
<i>Reduced Labor Cost from Better Diagnostics</i>		<i>\$147,825</i>
<i>60% Reduction in Routine Maintenance</i>		<i>\$106,320</i>
<i>16.5M kwh Energy Reduction</i>		<i>\$1,180,608</i>

Key Sustainability Initiatives: Regenerative Braking

- **Scope:** Two Storage Devices to be Installed at Substations to Capture, Store & Reuse Regen Power
- **Project Costs:** \$1.8 Million Each
- **Grant Awards:** \$900,000 from State Energy Development Authority; \$1.4 Million from Federal Transit Administration
- **Partnership:** Smart-Grid Firm Will Cover Incremental Project Costs in Return for Share of Revenues
- **Progress:** First Storage Device in Demonstration Phase; Second in Procurement



Key Sustainability Initiatives: Wayside Storage Pilot Project

- **Project Goal 1:** Capture 50% of Wasted Regen Power
- **Project Goal 2:** Reduce Energy Consumption at Substation by 10-20% (More than 20 Similar Substations Across System)
- **Key Outcome:** Replicable, Scalable Public-Private Partnership Model for Energy Savings – Broader Application at SEPTA & Other Transit Agencies



Wayside Storage Pilot Project: Goals & Outcomes

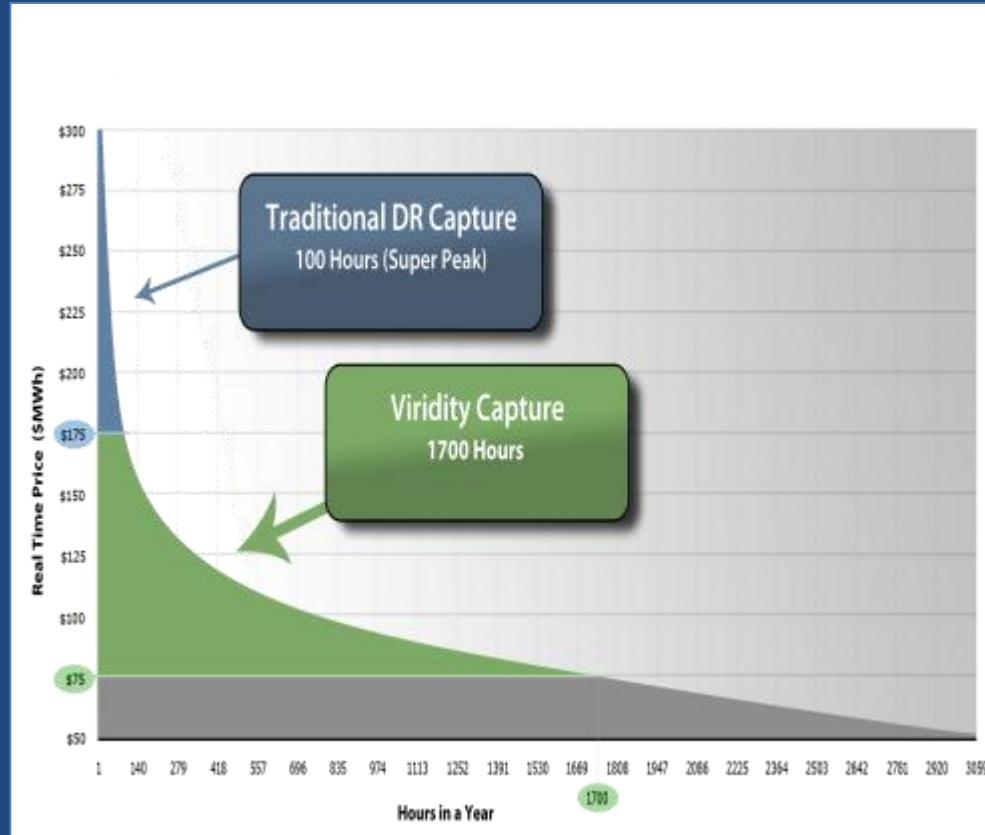
➤ Benefits From:

- 1) Reduced Energy Consumption
- 2) Demand Response
- 3) Regulation Market Participation (Selling Back to the Grid)

➤ Annual Benefit Per Device:
\$261,571

➤ 10-Year Useful Life

➤ Net Return Per Device:
\$863,707



Wayside Storage Pilot Project: ROI Calculation

- Strong Business Case With Return on Investment
- Source Separated, Single Stream Recycling at Headquarters & All City Transit Stations & Facilities
- \$41.33 Per Ton for Single-Stream Recyclables (Estimated Annual Benefit: \$170,000)
- Waste Oil Recycling (FY2011: 130,425 Gallons – \$123,780 Revenue, \$50,000 Avoided Disposal Fees)
- Railroad Ties Recycled/Reused to Avoid Disposal



**Key Sustainability Initiatives:
Reduce-Reuse-Recycle**

- Lighting System Conversion
 - Stations, tunnels, shops & signals
 - Rebates from electric utility (Total: \$22,492 rebate for three projects in FY2011)
- New Boilers & Chillers for Fuel Efficiency
- Management of Hazardous & Non-Hazardous Shop Waste
 - Used catalytic oxidizers to recover platinum
 - Waste fluorescent lamps to recover mercury
 - Antifreeze recycled and reused on site
 - Recycling of vehicle batteries
- Resale of Scrap Metals
- Reclamation of Water on Vehicle Washers
- Underground Retention Basins In Design for Stormwater Management
 - Partnership with Philadelphia Water Dep't



**Bus Washer at
Midvale Depot**

Key Sustainability Initiatives: Energy, Water & Waste Efficiency

- First LEED-Silver Railroad Station in America
- Designed For:
 - 20% Reduction in Potable Water Use
 - 30% Reduction in Electricity Use
- Use of Sustainable Construction Materials
- 96% Construction Waste Reused or Recycled
- Implementation of Ongoing Recycling Program



Key Sustainability Initiatives: LEED Certification at Fox Chase Station

- EPA EnergyStar Award
- Motion Sensors & LED Lighting Fixtures
- Steam Cogeneration Facility
- Daytime Cleaning: 24% Reduction in Building Run-Time
- 14% Reduction in Electricity Consumption Since 2008 (\$100,000 in Annual Savings)



Key Sustainability Initiatives: Energy Efficient Headquarters

*Sustainable
Transit System*

*Sustainable
Region*



SEPTA's Leadership Position

Sustainable

Not Sustainable



What's At Stake: Regional Sustainability



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