Presentation to
AASHTO RR101 Webinar - Equipment

M. Bergeron
Chief Mechanical Officer

April 9, 2013
Agenda

- Amtrak Mechanical Department
- Maintenance Plan & Production Capabilities
- Fleet Renewal Plan & New Equipment
- New Facilities
Agenda

• Amtrak Mechanical Department

• Maintenance Plan & Production Capabilities

• Fleet Renewal Plan & New Equipment

• New Facilities
Mission & Performance Fundamentals

• Mechanical Mission:
  – Create a *cost-efficient* vehicle maintenance program that will *consistently* produce *safe, clean, and reliable* equipment for our *customers* nationwide by *continually improving* the *process* through *teamwork* and *safe work practices*.

• Performance Fundamentals:
  o *Safety*
  o *Fleet Performance*
    - Reliability
    - Availability
  o *Productivity*
  o *Regulatory Compliance*
Major Terminals and Back Shop Locations

- Wilmington
- Rensselaer
- New York
- Wilmington
- Bear
- Washington
- Chicago
- Beech Grove
- Sanford
- New Orleans
- Hialeah

Workforce: 4,500 employees
Back Shops

**Wilmington**
300 employees

**Beech Grove**
500 employees

**Bear**
300 employees
Active Passenger Fleet

- 1,540 Cars
- 396 Locomotives
- 25 Trainsets
- Average Age = 29+ years
- Average Miles/year
  - Cars = 180,000
  - Locomotives = 155,000
  - Trainsets = 175,000
- In a typical day, Mechanical
  - 305 trains serviced per weekday
  - More than 4,000 toilets serviced per day
  - Over 725,000 unit-miles run per day
  - Twenty Periodic Maintenance (PM) procedures completed per day

Source: American Public Transit Association, 2011 Reports
American Recovery and Reinvestment Act Equipment (ARRA)

- 15 P40s upgraded to P42s standards
- 60 Amfleet
- 20 Superliners
- Viewliner Prototype Diner 8400

Annual Amtrak Ridership, by FY
Mechanical Workflow

1. On-board crew use the eMAP-21A app on their iPhone to log maintenance issues in route.

2. Issues logged in to WMS system, and work orders opened, associated with train and car numbers.

3. Shop forces at train terminal prepare for train arrivals by reviewing incoming open work orders and allocating work among personnel.

4. Repairs and inspections performed during layover to ensure equipment ready for next scheduled use. On-board crews have access to closed work orders so they can see how their reports positively impact service.

5. Quality • Production • Overdue PM • Financials • People • Lean / 6 Sigma, …
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• New Facilities
Types of Maintenance

• Periodic Inspections/ Preventive Maintenance
  – Daily, 15 day, 92 day, 120 day, Annual

• Continuous Maintenance (CM)

• Overhaul
  – Level 1, 2, & 3

• Life-Cycle Preventive Maintenance (LCPM)

• Corrective/Bad Order Repair

• Accident/ Wreck Repair

Amtrak’s maintenance methodology
Overhaul Scopes of Work

• **ALL Overhauls**
  ✓ Include Safety Mandatory & Federal Requirement for Air Brake

• **LEVEL 1 Overhaul**
  ✓ Alternating Cycle 4 Years after Level 2 or 3
  ✓ Critical Capital Component

  ➢ Overhaul Renewal or Replacement of Trucks, Brake Valves, HVAC – Air Conditioning Compressor / Condenser Units, Air Conditioning Control Panels, Heat Control Panel, Door Control Panels, Batteries, Battery Charger, 480 Volt End Connection Cables, Public Address Unit, Seat Cushions, Floor Carpet, and Toilets.

  ➢ During a Level 1 all other components / systems will be inspected, repaired or replaced as necessary.
Overhaul Scopes of Work

• **LEVEL 2 Overhaul**

  ✓ Scheduled Every 8 Years

  ✓ Most Capital Components Renewed

  ➢ Level 1 Critical Capital Component Overhaul Renewal or Replacement of Trucks, Brake Valves, HVAC – Air Conditioning Compressor / Condenser Units, Air Conditioning Control Panels, Heat Control Panel, Door Control Panels, Batteries, Battery Charger, 480 Volt End Connection Cables, Public Address Unit, Seat Cushions, Floor Carpet, and Toilets.


  ➢ During a Level 2 all other components / systems will be inspected, repaired or replaced as necessary.
Overhaul Scopes of Work

• **LEVEL 3 Overhaul & Reconfiguration**
  ✓ Schedule Driven by Market Demands
    ➢ Includes Major Modification of Equipment (i.e. ADA Bathroom Modules, Interiors are Fully Upgraded, Marketing Service Initiatives)
  ✓ All Capital Components Renewed
    ➢ All Capital Components Receive Overhaul Renewal or Replacement
    ➢ During a Level 3 all other items / systems will be inspected, repaired or replaced as necessary.
FY13 Production Plan

- PMs – 6,760 Inspections Planned

- FY13 Capital Production:
  - Bear – 156 Amfleet & Cab Car Overhauls
  - Beech Grove – 154 Car & Locomotive Overhauls
  - Wilmington – 16 Locomotive Overhauls
  - Acela – 2 Trainsets in Major Work Program
  - LCPM: 448 Events Planned

<table>
<thead>
<tr>
<th>Procedure</th>
<th>LCPM Cycle</th>
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<tbody>
<tr>
<td>Paint</td>
<td>10 years</td>
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<tr>
<td>Engines</td>
<td>6 - 7 years</td>
</tr>
<tr>
<td>Trucks</td>
<td>5 - 10 years</td>
</tr>
<tr>
<td>HVAC</td>
<td>5 years</td>
</tr>
<tr>
<td>Air Compressor</td>
<td>8 years</td>
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Bear: Amfleet I Food Service to Coach Conversion

Gutted Interior (Before)

New window cut into side wall.

Completed Interior

Amfleet I
Food Service to
Coach Conversion
Car # 28350

ARRA Stimulus work

New ADA Bathroom
Beech Grove: Superliner Coach Car

LEFT:
Superliner I Coach Car 34040 New ADA Lower Level Module

BOTTOM: Economy bedroom

ARRA Stimulus work
Before & After

Beech Grove: Superliner Level 3 Sleeper

Aesthetics & Easy to Maintain Hard Surfaces
Beech Grove: Viewliner Single Level Diner Prototype

Car 8400
Beech Grove: Accident / Wreck Repairs

P42-8
Locomotive 121
Damaged
July 11, 2011
North Berwick, ME
Mechanical Services

• “One Stop Shop” for Mechanical Maintenance needs
  – Regulatory inspections,
  – Preventative Maintenance,
  – Life Cycle Maintenance,
  – Reliability Centered Maintenance,
  – Rolling Stock Overhauls,
  – Component Overhauls Wreck Repair
  – Rolling Stock Engineering

• Over 40 years of experience in maintaining a wide variety of equipment

• Extensive experience working with regulatory agencies, Host railroads, States and Commuters

Contact: Daniel Ruppert (rupperd@amtrak.com)
Senior Director Mechanical Contracts
1 (888) 920-6378
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• New Facilities
Fleet Investment and Acquisition plan

- Fleet replacement based on Commercial Life & and Program Infrastructure
- Average Fleet age = 29+ years
- 2013 v. of Fleet Strategy Plan to be released

<table>
<thead>
<tr>
<th>Type</th>
<th>Lifespan</th>
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<tr>
<td>Single Level Coaches</td>
<td>30 years</td>
</tr>
<tr>
<td>Bi-Level Coaches</td>
<td>30 years</td>
</tr>
<tr>
<td>Tier I Trainsets</td>
<td>25 years</td>
</tr>
<tr>
<td>Tier II Trainsets</td>
<td>20 years</td>
</tr>
<tr>
<td>Electric Locomotives</td>
<td>25 years</td>
</tr>
<tr>
<td>Diesel Locomotives</td>
<td>20 years</td>
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A snapshot of the present

FY2012-23: $10.1b
Fleet Strategy: Long Distance Single Level Cars

- Purchase 130 Long-Distance Single-Level (LDSL) cars

- August 2010 - Contract Award
- First units placed is Revenue service  2014
- Last Car Delivered  2015

<table>
<thead>
<tr>
<th>CAR TYPE</th>
<th>BASE ORDER</th>
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<tbody>
<tr>
<td>BAG/ DORM</td>
<td>25</td>
</tr>
<tr>
<td>SLEEPER</td>
<td>25</td>
</tr>
<tr>
<td>DINER</td>
<td>25</td>
</tr>
<tr>
<td>BAGGAGE</td>
<td>55</td>
</tr>
<tr>
<td>TOTAL</td>
<td>130</td>
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Fleet Strategy: Electric Locomotives

- Purchase 70 electric locomotives
  - October 2010 Contract Award
  - First Locomotive Placed in Revenue Service by Fall 2013
  - Locomotive No. 70 Delivered by Spring 2016
Fleet Strategy: Next-Generation High Speed Rail

- Request For Information issued January 2013, joint with California HSR Agency
  - Seeking off-the-shelf trainsets that will work for both of us

- Amtrak plans 10 to 12 in 2016/7
  - CHSRA plans 27 in 2018/9

- Amtrak plans to replace Acela Fleet 2022/4

- Request For Proposal planned for September 2013 release
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Los Angeles & Hialeah - Progressive Maintenance Facilities

LAX Elevation
Looking Southwest

Overall Facility Floor Plan

Inbound Pad
- Pre-inspection
- Vendor cleaning
- Pest control
- Toilet dump

Spot 1
- Inspection
- Strip Seats
- Draft gear and couplers
- Diaphragms
- MPT1000 test
- Interior strip
- HVAC

Spot 2
- Trucks
- Brakes
- 480v cable inspection/repair
- Doors/door operators
- CO2 & S
- Under car inspection

Spot 3 (Buffer)
- Rapid Response Team would perform any catch-up work here (Bad-order repairs)

Spot 4
- Food Service
- Power door repair
- Lighting Inspection
- Trap Doors
- Change Toilets

Spot 5
- PM E-Clean
- Apply equipment
- Single Car Test

Outbound Pad
- Bad Order repairs
- Catch-up work
- Queueing

Inbound Pad
- Pre-inspection
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Outbound Pad
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HIA Aerial Photo
Looking Southeast

Looking at Spot 2 - Truck Change with In-Floor Traversing Jacks
Seattle, WA – Phase I & II

• Looking South

Looking North
• Thank you for your time and interest

• Questions?