



**Moving Public Transportation
Into the Future**

Essential Elements of a Successful Preventive Maintenance Program

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Why Be Concerned with Preventive Maintenance

- ◆ Required by FTA
- ◆ Required by ODOT
- ◆ Fleet Manager Can be Held Liable for Negligent Entrustment
 - If You Know or Have Reason to Know a Vehicle is Unsafe or Creates an Unreasonable Risk to Harm to Others, You Can be Held Liable if an Accident Occurs
- ◆ Maintaining a Safe Fleet is the Right Thing to Do

Why Be Concerned with Preventive Maintenance, Continued

- ◆ Preventive Maintenance is Essential to Every Effective Maintenance Program as it Helps Ensure:
 - Vehicle Reliability
 - Safety
 - Longevity

What the Regulations Require

- ◆ The Subrecipient and/or Designated Operator Shall Have the Requisite Fiscal and Technical Capacity to Carry Out the Project and Be Responsible for
 - Maintaining Required Insurance Coverage, Property Records, **Conducting Physical Inventories, Implementing Adequate Property Control Systems**



What the Regulations Require, Continued

- Maintaining the Equipment in Proper Working Condition
- Documentation Must be Available Upon Request



What This Means

- ◆ Federally-Funded Equipment and Facilities Must Be Kept in Good Operating Order
- ◆ PTD and Subrecipients Are Responsible for Vehicles and Other Equipment Financed by State or Federal Grants
- ◆ Vehicles Must Be Maintained in Good or Better Condition and Must Be Used for the Purposes Described in the Grant Agreement



Essential Elements

- ◆ Personnel Roles and Responsibility
- ◆ Asset Management
- ◆ Inspections
- ◆ Routine Service and Maintenance Intervals
 - Each Vehicle Type is Unique
- ◆ Safety and Security



Essential Elements, Continued

- ◆ Replacement versus Repair
- ◆ Warranties
- ◆ Monitoring
- ◆ Training
- ◆ Performance Measures



Personnel Role and Responsibility

- ◆ Pay Attention to Administrative Details
 - Who Does a Driver Report Defect To
 - Who Assigns a Replacement Vehicle
 - Who Prioritizes Repairs
 - Who Decides When a Vehicle is Not Roadworthy
 - Who Schedules Maintenance
 - Who Monitors Maintenance Repairs
 - Who Maintains Maintenance Files
 - Who Evaluates Preventive Maintenance Program



Asset Management

- ◆ Asset Management Policy
 - Preventive Maintenance Plan
 - Maintenance Schedule for Each Fleet Vehicle
 - Manufacturer Recommendations
 - Warranty Requirements
 - ADA Equipment
 - Inspection Documentation
 - Oregon Annual Safety Inspections

Asset Management, Continued

- ◆ Plan and Procedures for Unexpected Repairs
- ◆ Vehicle Cleaning Program
- ◆ Secure Vehicle Storage
- ◆ System for Scheduling and Tracking Maintenance Activities
- ◆ Records of Vehicle:
 - Service and Repairs
 - Work Orders
 - Invoices
 - Receipts



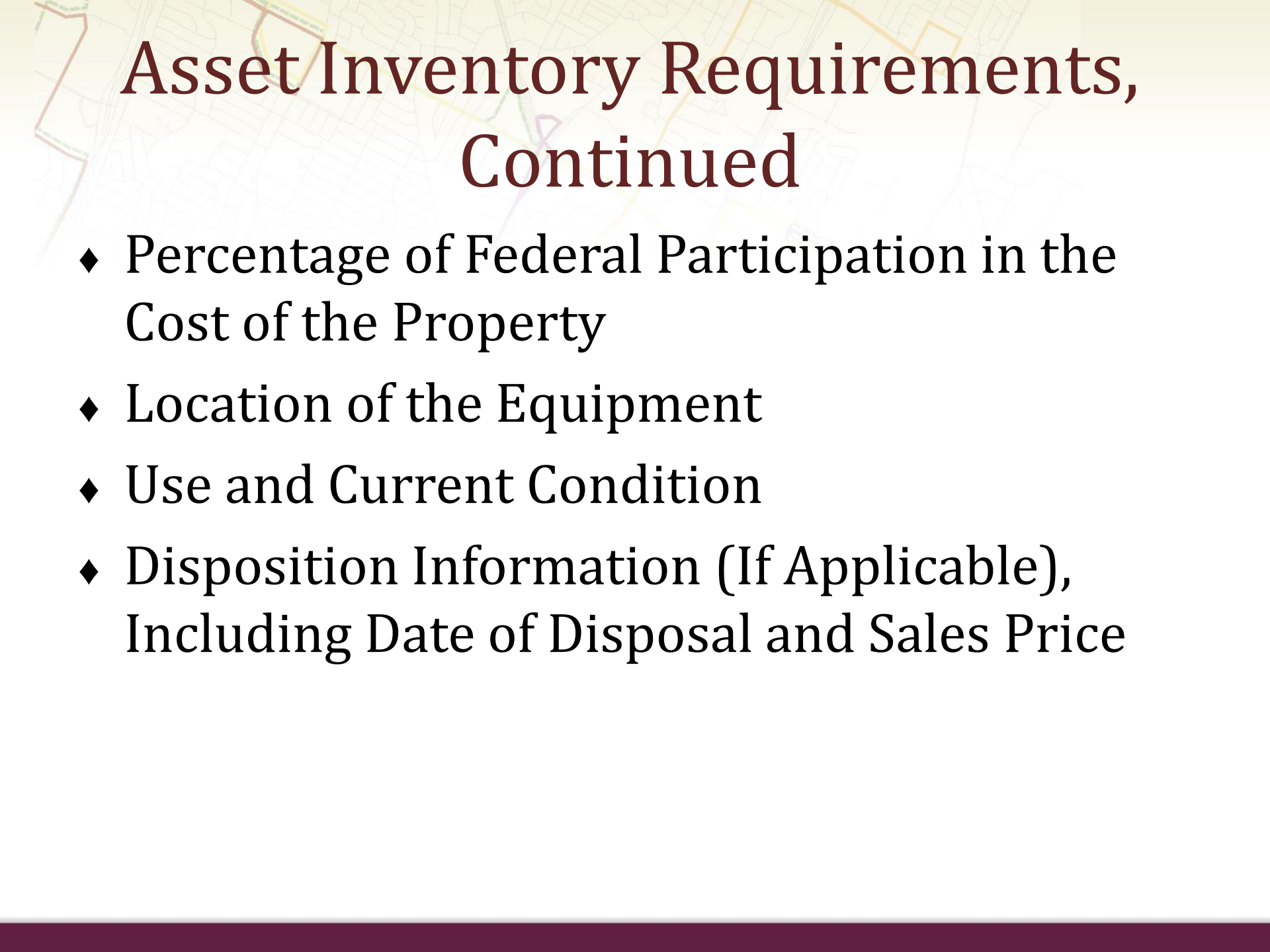
Asset Inventory

- ◆ Any property with Federal funds valued at \$5,000 or more must be accounted for in the agency's fixed asset listing. The asset listing is to contain the Federally required information



Asset Inventory Requirements

- ◆ Description of the Property
- ◆ Serial Number or Other Identification numbers
- ◆ Source of the Property (Grant Source, Program Number) Name of the Title Holder
- ◆ Acquisition Date
- ◆ Cost When New



Asset Inventory Requirements, Continued

- ◆ Percentage of Federal Participation in the Cost of the Property
- ◆ Location of the Equipment
- ◆ Use and Current Condition
- ◆ Disposition Information (If Applicable), Including Date of Disposal and Sales Price



Vehicle Useful Life

- ◆ Large Heavy Duty Transit Bus, 35 to 40+feet
 - 12 Years and 500,000 Miles
- ◆ Medium Heavy Duty Transit Bus, 30 to 35 feet
 - 10 Years and 350,000 Miles
- ◆ Medium Size Medium Duty Transit Bus and Truck Chassis Cutaway, 25 to 30 feet
 - 7 Years and 200,000 Miles



Vehicle Useful Life, Continued

- ◆ Medium Size Light Duty Bus and Van Chassis Cutaway Bus, 20 to 25 feet
 - 5 Years and 150,000 Miles
- ◆ Small Light Duty Bus, 20 to 22 feet
 - 4 Years and 100,000 Miles
- ◆ Modified Vans, < 20 feet
 - 4 Years and 100,000 Miles
- ◆ Modified Minivans
 - 4 Years and 100,000 Miles



Inspections

- ◆ Key to Early Detection
 - Improves Safety
 - Decreases Vehicle Repair Costs
 - Decreases Vehicle Downtime
- ◆ Drivers and Mechanics Should be Performing Routine Inspections
 - Daily Pre-Trip Inspection
 - Daily Post Trip Inspection
 - Inspections During Routine Maintenance



Inspections, Continued

- ◆ Management Must be Realistic in Expectations
 - A Proper Pre-Trip Inspection Will Improve Reliability, But Will Take 20 to 30 Minutes to Perform
 - Post-Trip Inspections May Take 10 Minutes to Perform

Routine Service and Maintenance

- ◆ Heart of the Preventive Maintenance Program
 - Maintaining the Vehicle
 - Driver is first line of defense
 - Use certified mechanics
 - Make Service Intervals Mileage Multiples of Some Common Denominator, e.g.
 - Oil change every 3,000 miles
 - Tire rotation every 6,000 miles
 - Change transmission fluid every 24,000 miles

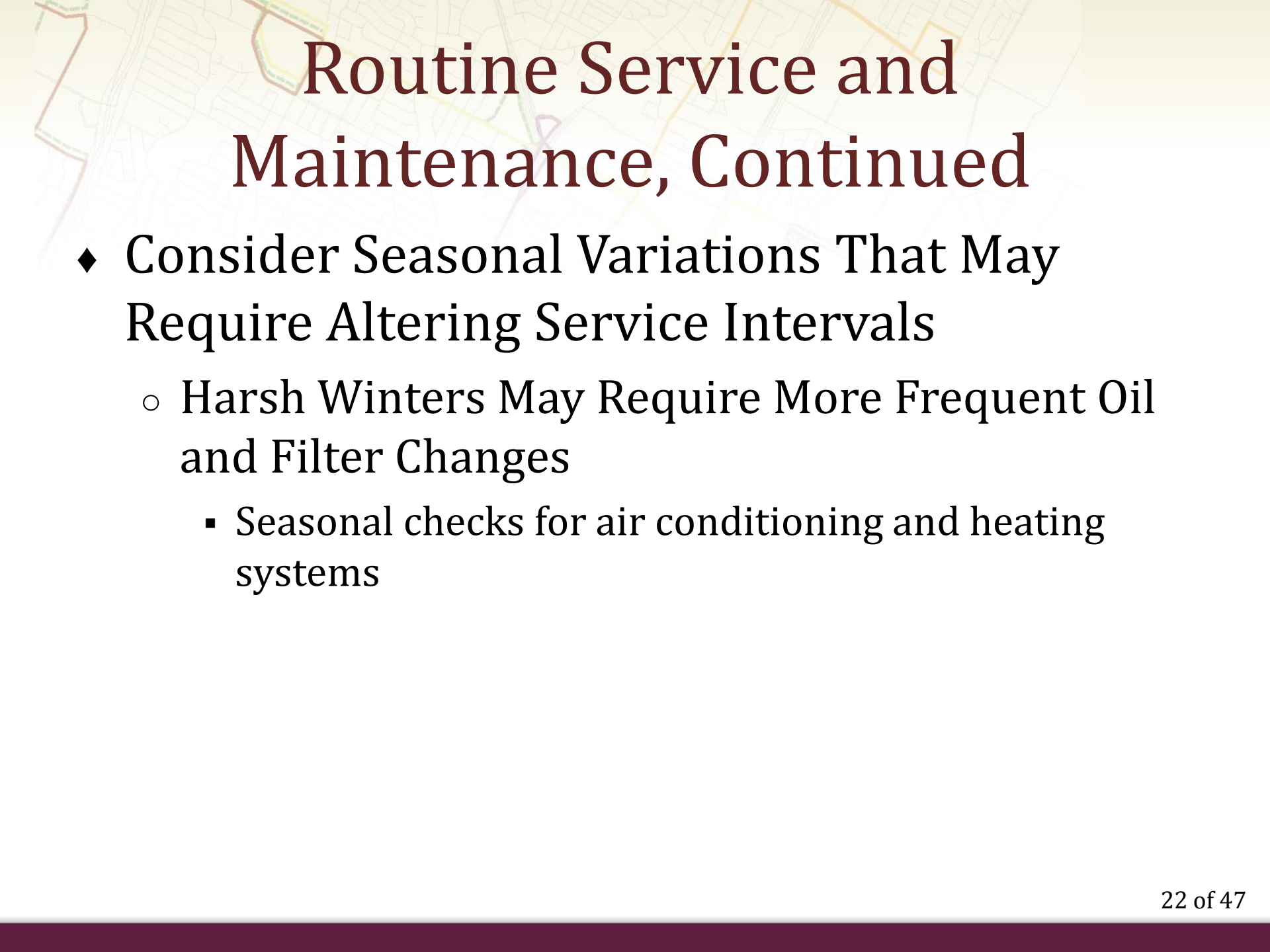


Routine Service and Maintenance, Continued

- Schedule Must Include All Tasks Required to Keep Vehicle in State of Good Repair and Warranty Eligible
 - Maintenance schedules must meet or exceed manufacturer's recommendations
- Documentation of All Maintenance Including Mechanic Follow-up on Reported Problems

Routine Service and Maintenance, Continued

- ◆ Maintenance Records Including Maintenance Schedules Must Be Kept as Long as the Vehicle Remains in Service Plus 3 Years After Removal From Service
 - Includes Back-up Vehicles
- ◆ ADA Equipment Must Be Included in the Preventive Maintenance Plan and Documented



Routine Service and Maintenance, Continued

- ◆ Consider Seasonal Variations That May Require Altering Service Intervals
 - Harsh Winters May Require More Frequent Oil and Filter Changes
 - Seasonal checks for air conditioning and heating systems



Routine Service and Maintenance, Continued

- ◆ Consider Service Area and Service Area Road Conditions
 - Gravel Roads
 - Constant Stops and Starts
 - Constant Driving at Low Speeds



Safety and Security

- ◆ Secure Parking Area
 - Fencing
 - Lighting
 - Alarm System
- ◆ Key Control System/Policy
- ◆ Secure Vehicles
 - Lock Vehicles
 - Remove Fare Boxes



Replacement Versus Repair

- ◆ “*If It Ain’t Broke Don’t Fix It,*” May Not be the Best Practice for Preventive Maintenance
- ◆ Apply Routine Replacement Schedules to Components Where Visual Inspection Is Used
 - Belts
 - Wiper Blades
 - Hoses



Warranties

- ◆ Your Vehicles Will Have Many Warranties From Varying Suppliers
 - Become Familiar With All Warranties
 - Know Who Is Responsible for Which Warranty
- ◆ All Vehicles Purchased Through a State Contract or Competitive Bid Have Warranties
 - At a Minimum These Warranties Cover Labor and Replacement Parts for a 12,000 Miles or One Year, Whichever Comes First



Monitoring System

- ◆ Track Your Maintenance Provider's Performance for
 - Price
 - Quality
 - Reliability
- ◆ Considerations Include
 - Repeat Repairs for the Same Problem
 - Use of Rebuilt Parts – Upfront Savings, But Shorter Operational Life



Monitoring System, Continued

- ◆ Documentation is Key
 - Database Enables Establishing Proper Intervals for Routine Service
 - Provides repetitive failure information to establish repair and replacement intervals
 - Information to evaluate performance of rebuilt parts
 - Provides early warning for impending major problems (sudden increase in oil consumption)
 - Back-up information for warranty claims
 - Documentation of driver abuse of vehicle



Monitoring Systems, Continued

- ◆ Quality Monitoring Includes Ensuring the Required Maintenance or Inspection is Actually Completed
 - Establish a System to Check Drivers and Mechanics
 - Tag items that should be checked during inspections and require tags to be returned
 - Place mark on oil filters and other filters and check to make sure filters were changed
 - Mark tires to confirm rotation
 - Check oil color after oil change



Monitoring Systems Continued

- ◆ Daily Review of Vehicle Pre-trip and Post-trip Inspections to
 - Establish the Inspection Was Completed
 - Consider security cameras in pre-trip area
 - Ensure Safety Issues Have Been Corrected
 - Identify and Document New Issues With the Vehicle
 - Capture Mileage Information to Plan for Routine Maintenance



Training

- ◆ Effective Training is Essential to Proper Vehicle Inspections and Identification and Diagnosis of Vehicle Problems
 - Ensure Mechanics Are Adequately Trained
 - Includes certifications for maintenance of ADA lift equipment
 - Ensure Drivers Receive Pre-Trip and Post-Trip Inspection Training and Refreshers



Performance Measures

- ◆ Reporting and Analyzing Summaries and Trends Related to Vehicle Maintenance is Essential for Overall Program Management
- ◆ Track, Analyze, Establish Benchmarks for
 - Miles Between Road Calls
 - Average Miles Per Gallon
 - Average Miles Between Tire Replacement
 - Vehicle Downtime for Repairs
 - Average Vehicle Maintenance Cost per Revenue Mile



Performance Measures Continued

- ◆ Track Factors that Affect Customer and Public Perception
 - Number of Complaints for Dirty or Damaged Vehicle
 - Complaints of Inoperable
 - Air conditioner
 - Heater
 - Lifts
 - Interior Lights



Summary

- ◆ Clearly Define Roles and Responsibility
- ◆ Keep Plan as Simple as Possible
- ◆ Properly Train Staff
- ◆ Monitor Vehicle Maintenance and Adherence to Plan
- ◆ Monitor Inspections and Maintenance Performed
- ◆ Establish Performance Measures for Evaluation of Program



Questions?

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